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The strategic defense initiative : implications for U.S. deterrence policy.

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THE STRATEGIC DEFENSE INITIATIVE: IMPLICATIONS FOR U.S. DETERRENCE POLICY

A Dissertation Presented

by

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TO MY WIFE CAROL

PREFACE

The strategic defense initiative has brought the issue of strategic defenses and particularly ballistic missile defenses back to the forefront of the ever raging national security debate. Issues that were thought foreclosed by the ABM Treaty in 1972 have reemerged as a host of new questions have been instigated by President Reagan's speech of March 23, 1983. This study will address the major implications and issues associated with the launching of the SDI. Five chapters assess these issues which include the lessons of the first ABM debate, prospective BMD models, the potential impact of a U.S. BMD on U.S. nuclear policy and associated obstacles to any change, the future role and composition of U.S. offensive nuclear forces, and the future of arms control.

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As an employee of the United States Government, in no way should any of this work be construed to be U.S. government policy or position.

ABSTRACT

The Strategic Defense Initiative: Implications for U.S. Deterrence Policy

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This dissertation concerns the issues surrounding the debate over the strategic defense initiative and its implications for U.S. deterrence policy. While ballistic missile defenses (formerly called ABMs) were believed foreclosed from the nuclear balance as a result of the ABM Treaty, the SDI program has brought ballistic missile defenses back into the strategic equation. It is possible to suggest that missile defenses, as envisioned by President Reagan, may make a significant contribution to U.S. national security. Given this proposition, the dissertation follows the analysis as outlined below:

1. The original ABM debate of the late 1960s is reviewed with respect to the arguments of proponents and opponents of the ABM. This debate led the U.S. to accept the dominance of offensive nuclear forces in the nuclear balance. Additionally, the U.S. decided to adhere to a policy for assured destruction based on the precept of mutual national vulnerability.

2. While the U.S. had foresworn working on ballistic missile defenses during the 197Us, the strategic nuclear balance and foundations of deterrence have changed. As a result, the U.S. is seeking to

evaluate the potential advantages of ballistic missile defenses. Three defense models are analyzed relative to their missions as well as major obstacles to their implementation.

3. United States strategic nuclear policy has evolved since the late 1960s to incorporate three major policy schools: assured destruction, countervailing, and nuclear war-fighting. Ballistic missile defenses fit with these policies in quite different ways. Additionally, a U.S. ballistic missile defense will have profound implications for the stability of the nuclear balance. There are a number of major obstacles to the integration of a missile defense into U.S. nuclear policy to include technology, program costs, and major political hurdles.

4. United States strategic offensive nuclear forces may be altered significantly by the deployment of a missile defense. However, new offensive weapons such as the cruise missile and advanced bomber could enhance the ability of offensive forces to penetrate strategic defenses.

5. A U.S. missile defense could effectively break up the ABM Treaty and spell an end to the arms control process. On the other hand, the SDI also may serve as an impetus to a new arms control treaty which incorporates reductions in offensive nuclear forces.

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INTRODUCTION

THE STRATEGIC DEFENSE INITIATIVE: IMPLICATIONS FOR U.S. DETERRENCE POLICY

An analysis of the political and strategic implications of ballistic missile defense is the heart of this paper. The central issue associated with a strategic defense, as envisioned by President Reagan's strategic defense initiative (SDI), is the potential for a complete revision of U.S. deterrence thought and specifically strategic nuclear policy. While the current strategic defense debate is a critical element in the future direction of U.S. deterrence thought and nuclear policy, there are a number of factors that will impede change. The politics of defining U.S. nuclear policy and arms control with the Soviet Union may restrain the efforts of proponents of a radically different U.S. deterrent posture.

Strategic analysts of the nuclear era, both inside and outside the government, generally accept the proposition that nuclear war is prevented by a policy and condition for deterrence. This proposition further prescribes the notion of a nuclear balance of power in which there can not be any hope of political or strategic gain from the initiation of a nuclear war. The basis of these concepts and the foundation of the nuclear balance between the U.S. and Soviet Union has been the dominance of offensive nuclear weapons since 1945. An effective defense against offensive nuclear weapons could thoroughly re-write the way the U.S. has thought of deterring nuclear war and

maintaining the nuclear balance. In effect, the development of strategic defenses leads the U.S. to question the basic purpose of its strategic nuclear policy and the composition of its nuclear forces.

It is the objective of this thesis to describe and analyze the possible implications of the development of strategic defenses for the various components of U.S. deterrence theory and policy. As U.S. deterrence theory entails a number of related components - a declaratory nuclear policy, a force development policy, a weapons employment policy should war occur, and an arms control policy - it is essential to examine how a strategic defense could impact each of these areas. In this context, the general thesis question can be made as follows:

> What are the political and strategic implications of ballistic missile defenses for U.S. strategic nuclear policy, U.S. nuclear forces, and the strategic arms control process?

A number of more specific questions come to mind when considering the subject:

1. How does the current debate over BMD compare with the ABM debate of the 196Us and if they are different why?
2. Will a defense dominated strategic balance profoundly change nuclear doctrine or merely alter its basis?
3. What would be the focus of U.S. nuclear policy respecting our policy for deterring nuclear war? For example, will the U.S. continue to maintain a policy for retaliation?
4. What mix of offensive and defensive weapons will ensure U.S. security in a BMD dominated balance?
5. What are the options for U.S. policy during a transition

period to a defense dominated balance that can maintain a stable transition?

6. What are the different BMD models and system's architecture and how effective are they likely to be against the emerging offensive threat?

7. What might be the impact on the levels of damage that could result in a BMD world?

8. What roles can arms control play in a defense transition?

9. What are the political obstacles to BMD deployments?

A reasonable assumption might be that ballistic missile defenses will become a part of U.S. or Soviet strategic forces in the near future. The potential for BMD to revolutionize the way the U.S. views the nuclear threat demands that its implications be understood. That is, as ballistic missile defenses become an increasingly important component of the strategic nuclear equation, it will be crucial to have explored the implications for policy and nuclear force that will inform and guide the decisions concerning the possible roles for a U.S. ballistic missile defense.

Chapter One will address the major currents and tenets of the original ABM debate. In particular, it will focus on the arguments for and against the ABM systems of the 1960s and how they influenced U.S. deterrence thought in the 1970s. The lessons of the original ABM debate are invaluable to the current defense debate. The similarities and differences between the arguments concerning the ABM then and BMD today are critical to our understanding of the implications that a strategic defense might have for U.S. nuclear policy today.

The cycle of offense and defense in weapons technology development, policy revision, and strategy has been dynamic for many decades. The ABM debate of the 1960s emerged while the advantages of offensive nuclear forces over defenses were increasing. The U.S. had maintained a clear advantage in the numbers of nuclear weapons deployed and their relative capabilities as compared to the Soviet Union as the first U.S. ABM system, the Nike-Zeus, was developed in the late 1950s. A primary impetus for the ABM system was the Soviet Union's growing capability to develop a credible and threatening ICBM force in the 1960s. The U.S. began to explore missile defenses as a means to maintain some margin of strategic superiority vis a vis the Soviet Union and to address the potential vulnerability of U.S. nuclear forces to a projected quickly growing Soviet nuclear force.

The thrust of the current strategic defense debate stems from an essentially different set of strategic dilemmas. United States nuclear forces have become more vulnerable to a Soviet nuclear attack over the past decade and, as a result, the strategic balance between the superpowers is considered increasingly less stable by many U.S. analysts. The Reagan Administration, upon entering office, charged that U.S. strategic forces were at their weakest point relative to Soviet forces in many years and that the situation would worsen unless new programs were initiated.

There was really very little doubt in the 1960s that U.S. offensive forces were capable of carrying out their deterrent mission whether or not an ABM system was deployed by either superpower. The emerging vulnerability of U.S. offensive nuclear forces to a

counterforce attack today, a result of the MIRVing and decreasing CEP of Soviet nuclear forces, has led many strategic analysts to question the continued deterrent credibility of U.S. offensive nuclear forces to deter Soviet aggression and maintain stability in a crisis environment.

The guiding principle of U.S. nuclear deterrence theory is the proposition that neither superpower can risk a nuclear war because of the threat of assured national annihilation. This threat, according to traditional deterrence doctrine, is made credible by the mutual vulnerability of each nation to a retaliatory strike by either side's nuclear forces. The only means of assuring this threat, according to the theory, is the maintenance of an invulnerable offensive nuclear force capable of retaliating after any initial attack.

During the early 1960s, as ICBMs and submarines became more reliable vehicles for launching nuclear weapons, the U.S. sought to develop and procure a redundant TRIAD of offensive weapon systems. The technical objective was to ensure the free flight of U.S. nuclear warheads to the Soviet Union in case of war. The ABM was envisioned, apart from this goal, as a means of degrading a Soviet intercontinental missile attack and protecting U.S. population centers and industrial resources. These defense objectives were later replaced by the less demanding goal of protecting U.S. ICBMs from a counterforce attack and the nation from third country threats as the ABM systems proved less capable against increasingly sophisticated offensive forces.

The success of the Safeguard program developments led to a number

of questions in the strategic community. As the Soviet arsenal began to catch up with that of the U.S. in the late 1960s, would a policy for massive retaliation or counterforce make any sense? Massive retaliation had been an outgrowth of U.S. strategic bombing concepts employed in World War II and had been extended to U.S. nuclear policy. Secretary of Defense, Robert McNamara, had advocated a counterforce policy for the U.S. in the early 1960s as a means of preserving U.S. nuclear superiority. Both policies began to appear less in the U.S.'s national interest as its superiority in nuclear weapons eroded. As a result, U.S. policy began to shift in favor of an assured retaliation posture. Central among its tenets was the idea that societal vulnerability was a reality of the nuclear era and that this condition could not be transcended. The Safeguard system was assessed to be capable of augmenting U.S. nuclear forces but could not protect the U.S. against a determined attack, hence, offensive forces would continue to maintain the burden of deterrence.

McNamara later argued that an enemy need only saturate U.S. defenses to achieve wartime objectives. The defense capabilities of ABMs could only delay an enemy's development of offensive capabilities to attack with success. In summary, the ABM emerged as the strategic balance was becoming more equal and the offensive arms race came to be seen as a greater threat to strategic stability than the vulnerability of the nation at large. However, national vulnerability remains the building block of nuclear deterrents in an offensive nuclear balance.

From these strategic conditions emerged the dominance of a policy for assured destruction. Later codified in the SALT I talks, assured

destruction became U.S. strategic gospel and is seen by its advocates as the only means to prevent the use of nuclear weapons by preserving a credible threat for retaliation. In conjunction with the growing dominance of this policy was a perceived requirement to maintain a redundant nuclear force. The deployment of a strategic Triad of ICBMs, SLBMs, and strategic bombers is an effective means for ensuring that U.S. retaliatory forces can withstand any attack and still strike back with tremendous power. That is, should any part of the Triad be destroyed, any of the other legs can launch a devastating retaliation against an enemy. The U.S. decided that a force level equivalent to roughly 1,054 ICBMs, 600 SLBMs, and roughly 450 strategic bombers was sufficient to meet its deterrent objectives. These forces were judged by the Department of Defense to be capable of causing 'unacceptable damage' to any enemy under any condition. The U.S. froze the numbers of its nuclear weapons at a level consistent with assured destruction policy.

The two major U.S. ABM programs of the 1960s, the Nike and Safeguard ABMs, would not have changed the U.S. force posture appreciably. In effect, the ABM debate helped solidify U.S. strategic nuclear policy and force posture behind assured destruction. The potential usefulness of ABM defenses for either superpower accelerated development and deployment of multiple independently targeted reentry vehicles (MIRVs), thereby enhancing the offense's overall assured destruction capability. Yet, the development of the ABM was felt most strongly in the strategic arms control arena.

Arguments against an ABM system gained support with the emergence

of assured destruction policy. The U.S. began to favor a parity of forces between the U.S. and Soviet Union as an effective means of preserving a stable strategic balance. Opponents of the ABM concluded that one of the more threatening prospects for U.S. security was an all-out offensive arms race. Defenses, in this context, were seen as a primary impetus to a new offensive arms race. As such, United States security could be guaranteed only if neither superpower sought superiority and each restrained its offensive arms developments. These arguments, in turn, supported arms control as a means to cap the arms race and help promote a stable nuclear balance.

The development of the ABM led, in part, to a number of changes to U.S. strategic policy, forces, and arms control positions. These revisions eventually led to the severe limitation of ABM deployments through the ABM Treaty. In effect, the ABM was unable to meet the criteria for strategic and arms control stability imposed by champions of assured destruction, which represented an emerging principle of U.S. strategic nuclear policy.

The Reagan Administration and other proponents of a ballistic missile defense system today argue that the deployment of a missile defense will strengthen deterrence by negating the offensive threat, thereby enhancing U.S. security. They question whether deterrence by threat of retaliation can avert a nuclear holocaust indefinitely. Proponents also argue that a BMD system is the only alternative to a destabilizing offensive nuclear arms buildup that has been ongoing since the signing of the ABM treaty.

Ashton Carter and David Schwartz have identified three currents

in the pro-BMD arguments. They state that strategic defense is seen as a viable option to the present offensive nuclear balance as a result of: 1. the moral repugnancy with the vulnerability of the nation to nuclear devastation; 2. the increasing counterforce threat to U.S. ICBM forces; and 3. the disenchantment with the arms control process and its inability to restrain the arms race and contain the Soviet nuclear threat.

Chapter TWO will address various defense models and their related technology. The extent to which U.S. strategic nuclear policy is revised by the deployment of a BMD system is a function of the goals for which the deployment is undertaken. For example, the Sentinel ABM was conceived as an 'area wide city' defense. The technical infeasibility of an area defense led Department of Defense analysts to conclude that deterrence could continue to be better served by a credible offensive retaliatory force. Today the Reagan Administration is questioning whether deterrence might be better served by the protection of U.S. cities and strategic forces against a Soviet nuclear attack. A BMD could function to defend U.S. retaliatory forces and preserve the strategic balance by helping to close the so-called 'window of vulnerability'. The responsibility for maintaining a credible U.S. deterrent, in this situation, would shift from various strategic force basing modes to a shared responsibility on the part of the defense system.

Ballistic missile defense also could be used to protect military targets, such as command-control-communication centers and critical military satellites. As such, defenses could serve to augment U.S.

wartime escalation capabilities in a nuclear war-fighting mode as suggested by Colin Gray.

Lastly, BMD might be used to defend 'valued' targets such as the U.S. population. In this role, a defense system would be expected to have a considerable advantage over offensive nuclear weapons as to prevent confident targeting on the part of an enemy.

Chapter Three will address the degree of fit or conflict between BMD and U.S. strategic nuclear policy as currently formulated. For example, how will BMD influence U.S. policy for retaliation, national command authority (NCA), strategic stability, and losses in each phase of confrontation: peace, crisis, trans-attack, and post-attack? Given that the purpose of this thesis is to provide a description and explanation of a U.S. BMD posture and doctrine, the question implicit in this analysis is how will the integration of BMD with U.S. strategic nuclear policy enhance U.S. security and degrade the Soviet nuclear threat? An explanation of the political and strategic implications of BMD in various scenarios can be made and will focus on the following aspects: targeting, weapons, and collateral damage.

United States strategic nuclear policy is currently composed of elements from assured destruction policy, countervailing policy, and war-fighting policy. The Reagan Administration would like to add to this elements of a strategic defense policy. Current U.S. policies are based on the premise that the U.S. will retaliate against a Soviet attack on a level that threatens unacceptable damage. However, the options for and roles which retaliation could play change with the implementation of a defensively augmented strategic balance. With the

incorporation of BMD, the policy of retaliation becomes a function of the effectiveness of the BMD system. If the U.S. deploys a perfect BMD system, one capable of destroying every missile launched in a Soviet attack, a policy of retaliation is unnecessary. At less than a perfect level of effectiveness, the U.S. will be left with a number of options for retaliation, such as responding on an equal level of intensity either against similiar, or very different, targets as those involved in the initial Soviet attack. If the U.S. chooses to retain its current policy of retaliation (the most probable scenario in an imperfect BMD environment), it would then have the option of conducting an immediate or a delayed response. However, immediate retaliation may introduce overwhelming numbers of RVs into the attack, confusing the BMD system and thereby greatly reducing its effectiveness. A delayed response would be less likely to interfere with a BMD system, but would allow the Soviets the opportunity to launch a second strike. In both cases, the U.S. must take into consideration the potential capabilities of Soviet countermeasures, to include the deployment of their own BMD system.

United States strategic nuclear policy is designed to deter Soviet aggression, preserve the nuclear balance, and maintain stability within the U.S. and Soviet strategic relationship. Each nation is attentive to opportunities and disadvantages at the margin of the strategic balance. A BMD system could make a marked difference in the present balance. In order to assess the impact a BMD system could have on strategic stability, it is important to understand what is meant by 'stability'. One must keep in mind that stability is

actually only relevant in a crisis situation. For it is in these instances that the threat to use nuclear weapons is greatest and where the stability of the balance is likely to determine whether or not nuclear weapons are used. For instance, if the nuclear balance is very stable, neither side is as likely to believe that gains can be made by escalating a crisis and using nuclear weapons.

At the most basic level, stability is composed of conditions which make the initiation of a nuclear war as unlikely as possible. One component of stability begins with an appreciation of the unimaginable destruction any nuclear war would cause. The strategic balance will remain stable as the appreciation for nuclear devastation continually is realized by each nation. Should one side perceive favorable opportunities at the margin of the balance, strategic stability is likely to weaken, portending disastrous results.

Strategic stability also can be defined in terms of force postures. Here the superpowers seek to make a nuclear attack as uninviting as possible by deploying their forces in as an invulnerable mode as possible. The United States, for its part, has emphasized its strategic Triad thereby assuring a redundancy of retaliatory capabilities.

Strategic stability is likely to be affected by the deployment of a BMD system under differing strategic conditions. In peacetime, a BMD system might increase the uncertainty of an attacker's success and thereby enhance deterrence against a calculated military stike. Under crisis conditions, the effectiveness of a BMD may influence the decision as to when and how to escalate beyond the nuclear threshold.

During an attack, the decision to escalate the intensity of nuclear attacks might depend on the integration of a BMD system into a war-fighting strategy. In a post-attack environment, decisions as to the prolongation and/or conclusion and post-war strategy might depend on the success of the BMD system.

The development and deployment of a BMD system by the U.S. is expected to provoke a number of Soviet responses. The Soviets may try to challenge a U.S. BMD system by escalating their offensive nuclear buildup and increasing their defensive programs.

The Soviets may view the U.S. BMD program as a technological challenge and respond in a number of other ways. The Soviets could respond through the arms control process, seeking to delay or restrain U.S. BMD efforts, a strategy the Soviets used in the original ABM debate. Soviets have already proposed a complete ban on space-based weapons.

A more ominous implication is the threat of a Soviet preemptive attack on a U.S. BMD system or U.S. offensive weapons. Many critics of the U.S. BMD program, such as the Union of Concerned Scientists, have suggested that a U.S. BMD deployment would increase Soviet insecurity and vulnerability as to portend a Soviet first strike. That is, a highly destabilized balance might arise in the event that the U.S. could defend itself against a Soviet first strike as well as a retaliatory strike. To avoid a destablizing BMD deployment, the U.S. might attempt to deploy its BMD while reducing offensive forces (particularly MIRVed counterforce ICBMs) during a defense transition period.

Chapter Four will discuss issues concerning the alternative level of offensive and defensive weapons that the U.S. will have to choose between. As well, it will be necessary to address the value of the ballistic missile in the face of an effective ballistic missile defense and the emergence of other, potentially more penetrable weapons systems, such as advanced cruise missiles with stealth technology.

The stability of the strategic balance also is dependent on the nuclear weapons currently deployed to support U.S. deterrent policies. The deployment of a BMD system will have important implications for the posture and composition of U.S. offensive nuclear forces.

In view of the potentially destabilizing effects of a BMD, it is unlikely that the U.S. will dismantle entirely its strategic offensive forces. Yet, the U.S. might consider a number of options to help preserve a stable strategic balance. The U.S. could increase its offensive nuclear forces, although this option may be seen as the most threatening by the Soviet Union. The Soviets are likely to perceive an increase in U.S. offensive forces as an attempt by the U.S. to attain strategic nuclear superiority. Second, the U.S. could maintain its forces at current levels. However, the most stabilizing option would call for reductions in U.S. offensive forces during the transition period. Yet, this kind of transition is likely to be the most difficult to attain. Such a balance would probably require in-depth agreements between the U.S. and the Soviet Union about the composition of their respective offensive nuclear forces. Offensive arms reduction agreements have alluded arms control talks between the

two nations for nearly twenty years and are unlikely to become easier to reach in the currently antagonistic atmosphere.

The U.S. nuclear arsenal possesses both countervalue and counterforce targeting capabilities. If, as expected, BMD degrades Soviet nuclear attack capabilities, the U.S. could continue to target Soviet ICBMs in an attempt to minimize further Soviet attacks. The U.S. also would have the option of allocating its offensive forces against Soviet countervalue targets in a more traditional assured destruction mode. In both cases, U.S targeting will depend on the effectiveness a BMD system might have against a first strike.

The deployment of a BMD by the U.S. also will bring into question the future effectiveness and deterrence value of the ballistic missile. As the ABM brought into question the value of the single warhead ICBM and helped foster the development of the MIRV, the current BMD developments will undoubtedly raise questions about the effectiveness of current U.S. nuclear forces. The potential obsolescence of the ICBM and SLBM may cause a shift to cruise missiles and advanced stealth bombers. The superpowers will seek to enhance their retaliatory capabilities in order to maintain the mutual hostage relationship (assuming BMD works imperfectly). Hence, deployment of greater numbers of air-breathing nuclear forces, such as the cruise missile, may effectively circumscribe a BMD system in the forseeable future.

One option for the U.S. force structure is continued reliance on ballistic missiles. The increased survivability of U.S. ICBMs, due to a U.S. BMD system, might be negated by the possible deployment of a

Soviet BMD system. A second option might be to rely more heavily on SLBMs because of their mobility, survivability, and shorter flight to target characteristics. Among these options, the deployment of cruise missiles and stealth bombers appears to be a highly credible means for preserving a retaliatory capability.

Almost all estimates of the effectiveness of a BMD system agree that a percentage of attacking RVs will penetrate or 'leak' through the defense. Even under 'leakage' conditions, a BMD system would lessen the value of ballistic missiles for a retaliatory attack. Given this condition, it is important to question the value of deploying a BMD system if strategic forces are subsequently shifted to coordinate a BMD deployment with an effective air defense system. The calculations for an attacker and defender will become uncertain as both will have to expect that their forces will have lost much of their effectiveness.

A ballistic missile defense deployment also will raise questions concerning the value of an overall strategy for strategic defense if a population defense is sought. Should civil defense become a major element in a strategic defense posture?

Chapter Five will address the implications of strategic defenses for arms control. Primary among the important issues to be discussed are the conditions under which a U.S. breakout would occur and the future prospects for arms control. The transition to a BMD world will certainly aggravate the asymmetries within the strategic balance and threaten its stability. Arms control can undoubtedly provide some opportunities to manage the transition period as it helped foreclose

on a defense transition in 1972 in hopes of other stabilizing measures to follow (namely offensive arms reductions).

The arms control process has been an integral part of the strategic nuclear relationship between the U.S. and the Soviet Union for twenty years. Arms control has helped preserve the offensive nuclear balance within certain bounds (i.e. number of launchers), but has been unable to halt the generalized offensive arms buildup in the quantity and quality (i.e. accuracy and lethality) of weapons systems. The uneven record of the arms control regime in promoting stability and in stopping the arms race has led many strategic analysts to question its continued value. Yet, despite the mixed results of arms control, it is likely to be an important part of a defense era.

The most important arms control treaties for BMD are the 1963 Test Ban Treaty, the 1967 Outer Space Treaty and the 1972 ABM Treaty. The 1967 Treaty bans all weapons of 'mass destruction' from outer space. The 1972 Anti-Ballistic Missile Treaty, the offspring of the orginial ABM debate, is one of the most important elements in the current defense debate. The Treaty does not explicitly restrict the development of space-based lasers. Yet, the general interpretation is that large-scale testing or deployment of a space-based BMD would require major revisions of the Treaty or its abrogation.

One argument in favor of the ABM Treaty in 1972 was that it would help restrain the offensive arms race. The U.S. government stated in conjunction with the ratification debates in the Senate that should offensive arms control negotiations prove unsuccessful following the ABM Treaty, the U.S. would reserve the right to withdraw from the

Treaty. Both the U.S. and the Soviet Union have the right to withdraw from the ABM Treaty if they believe that their 'national interests' are jeopardized by certain activities of the other party or other unspecified developments. Proponents of BMD today point to the lack of successful offensive arms control as one reason for the need to abrogate the Treaty and get on with strategic defense development and deployment. It is more likely that the U.S. will achieve a technological level from which it could deploy a space-based BMD system before the Soviet Union. It also seems likely that either the U.S. or the Soviet Union will eventually breakout of the Treaty and deploy a nationwide defense system.

There are several options which the U.S. can consider should it achieve an adequate technological level to deploy a defense system. The U.S. could delay its own BMD deployment until the Soviets were capable of deploying a system of their own. Under a simultaneous breakout the political implications for each nation could be more easily managed. In particular, the Soviets might not perceive a U.S. BMD deployment under these conditions as a strategic challenge to their nuclear forces. This scenario is likely to require arms control agreements on the timing and terms of a mutual breakout in order to preserve a stable transition. As well, it might provide the impetus for broader agreements to include offensive weapons systems.

In the case of a unilateral breakout by the U.S. or the U.S.S.R., the other superpower will view the breakout as a sign of great political importance and evidence of its military inferiority. Arms control agreements are likely to be very difficult to arrange in this

environment as little could be done to alter the political consequences of a unilateral breakout for the other nation. The destabilizing implications of a unilateral breakout could increase the possibility of enemy preemption during a crisis in order to forestall inferiority.

From the perspective of arms control, the transition period to a defensive balance is likely to be extremely sensitive. This period may provide an opportunity for arms control as the inferior nation (assuming a unilateral breakout) would have great incentive to prevent strategic inferiority. The superior nation also will feel pressure to stabilize the strategic balance through arms control in order to decrease the risk of a preemptive attack.

The value of arms control, to date, has been its ability to limit defensive and offensive nuclear forces. The predictability of the superpowers' strategic force postures, a result of arms control treaties to some extent, has been seen as a stabilizing factor in the nuclear balance. The development of defense technology has been viewed as an anachronism to the deterrence school that places great faith in arms control and hence, arms control advocates will not give up easily during the debate over a BMD deployment that would require the abrogation of current treaties.

Ballistic missile defense is a direct refutation of the philosophical bases underlying the ABM Treaty, the cornerstone of the arms control process to date. Yet, it may be unwise to limit BMD as it may be less threatening by itself than offensive nuclear forces and may enhance U.S. security. If this interpretation is correct, the

deployment of BMD may result in an accelerating arms control process in the future, exactly the opposite of the view held in the original ABM debate that saw an emphasis on limiting ABMs in order to promote arms control. The time near the deployment of BMD may have the greatest incentive for negotiations.

One can imagine a number of likely prospects for future arms control agreements. A reduction in offensive forces may prove the most stabilizing path to seek. As such, agreements might be reached before, during, or after BMD deployment. An agreement to reduce counterforce weapons (the MX ICBM for the U.S. and the SS-18 for the Soviet Union) might be a promising means of preserving a stable balance during the transition period. For the defense, arms control might address limits on countermeasures to BMD, such as penetration aids, decoys, and ASAT weapons (an active countermeasure to the BMD system).

NOTE: Much of the confusion surrounding the current debate about the strategic defense initiative is a function of the terminology involved. While the strategic defense initiative, strictly speaking, is a technology research program concerned with assessing and developing the technological requirements for a BMD, it does not represent a formal U.S. policy shift toward defense. The Reagan Administration has stated repeatedly that the SDI is aimed at making an informed decision possible by the early 1990s as to whether or not to begin full scale development of a missile defense. Critics of the SDI very often are more concerned with possible shifts in U.S. nuclear

policy than with the technology being researched. Hence, it is possible to think of this debate as concerned with various levels. At the doctrinal level it is a debate between offensive and defensive deterrence theory. At the strategic level are questions of the nature and type of defense to support a U.S. deterrence posture. That is, the U.S. may entertain area versus point defenses in support of countervalue or counterforce defense missions, respectively. Lastly, the current debate is engulfed by the various defense technologies. The strategic defense initiative is directed primarily against the threat of ballistic missiles. However, defense against the nuclear threat also encompasses strategic air defenses, civil defense, silo and military facility hardening programs, anti-submarine defense weaponry, and the like. While opponents and proponents of the SDI spar, they often do so at these different levels. An understanding of the SDI's implications necessitates that each level be examined.

The formal strategic defense initiative is divided into five major technological arenas. First is surveillance, acquisition, tracking, and kill assessment (SATK). These technologies are required to allow a ballistic missile defense system to detect, identify, locate and track an enemy's attacking missiles. These systems generally are dedicated for space-based platforms in a boost phase defense scheme. The major problems associated with these technologies are their ability to perform their missions throughout the ballistic missile's trajectory from boost to reentry. The second program encompasses the exotic weapons more formally called directed energy weapons (DEW), namely lasers (chemical, free electron, and x-ray) as

well as particle beam weapons. Both ground-based and space-based employment of these weapons are envisioned. Third, the SDIO is charged with exploring kenetic energy weapons to include 'smart weapons' (i.e. systems similar to the Homing Overlay Experiment) and traditional ABM type interceptors. Fourth, overall system design and battle management technologies are being researched to identify the command-control-communication requirements for a strategic defense. This area may emerge as the most critical and potentially the most difficult to develop. Lastly, the program has been directed to explore survivability, lethality, and key technologies to assure the system's ability to operate in a hostile environment.

As such, the program directors have been charged with exploring all potentially promising technologies and defense concepts during a five-to-ten year research and development phase. A part of the program's premise is to expand the number of defense options available to a president in order to prevent the Soviets from countering a U.S. defense too quickly. Whatever the outcomes of the SDI program, it is unlikely that strategic nuclear deterrence theory will remain the same in the United States. The SDI program has questioned the basis of U.S. deterrence thought for the past twenty five years. The original ABM program in the 1960s, while important to the future direction of U.S. nuclear policy, was not proposed as a possible means of re-writing the post-World War II strategic foundation which many believe has prevented a nuclear war between the superpowers. The central objective of the strategic defense initiative is to re-write this past history and help construct a new strategic world.

CHAPTER ONE

THE ABM REVISITED

In approaching a subject as complex as ballistic missile defense, it is important to look at the past to help decipher the future. This chapter will address several major themes. First, a review of the strategic issues associated with the ABM debate of the 1960s will be presented. Second, implications of the original ABM debate will be reviewed in order to understand some of the possible implications of the strategic defense initiative. And finally, U.S. deterrence policy will be analyzed in order to understand strategic patterns that may have an impact on the Strategic Defense Initiative (SDI).

The anti-ballistic missile (ABM) was conceived of as a means of combating the tremendous offensive threat posed by ballistic missiles to the security of the United States. As in the case of the emergence of the long-range bomber threat in the 1950s, the U.S. defense community set out to develop an effective countermeasure. In this regard, the task of destroying ballistic missiles was thought of as the logical extension of the capability of surface-to-air missile defenses (SAMs), which in the 1950s were designed to shoot down bombers. These ideas eventually resulted in the U.S. ABM program called Nike-Zeus.

The ABM and strategic defenses in general have been held in constant fascination by the military since the 1940s. Yet, after

having deployed an ABM defense system in the early 1970s, the U.S. decided to set these weapons aside in favor of and in conjunction with a different approach to maintaining U.S. security. While a number of factors -- both technological and political -- have led to a vacillation in support by policy leaders for a U.S. strategic defense, the Department of Defense has maintained a ballistic missile defense technology research program. Until President Reagan's call for the development of a comprehensive and effective strategic defense in March 1983, ballistic missile defenses had played a short-lived and minor role in U.S. deterrence policy at the strategic level. Defenses, however, have played a central role in U.S. deterrence policy in the past and ballistic missile defenses may come to play a very important role in U.S. deterrence policy as a result of the strategic defense initiative.

The post-World War II era can be divided into two distinct phases with regard to the importance placed upon strategic defenses. The first phase corresponds roughly with the period 1945 - 1972 during which strategic defenses were considered essential to the U.S. deterrent capabilities. The U.S. developed and deployed surface-to-air missile defenses against the predominant strategic threat posed during the 1940s and 1950s, Soviet strategic bombers. The U.S., much like the Soviet Union, also prepared extensive civil defense plans to help limit the level of damage the U.S. might receive during a war. Once ballistic missiles proved to be effective delivery systems for the superpowers' nuclear weapons, both superpowers began to work on anti-ballistic missile defenses.

The second phase, 1972-1983, began as a result of the signing of the ABM Treaty between the superpowers. This period represents the formal acceptance of the theory that offensive nuclear weapons hold a tremendous advantage over defenses.

A third phase in the post-war era may have started as a result of the Strategic Defense Initiative in 1983. While it is too soon to draw any definite conclusions about this new period, defenses against nuclear forces again may enter the U.S. strategic calculus.

The strategic objective envisioned by weapons designers for the ABM was effective protection for the nation from a nuclear attack carried by ballistic missiles. A defense of this capability is unquestionably desirable from both a military and political perspective. The ABM was conceived of as a means by which the U.S. might reduce, if not altogether escape, the tremendous potential damage that could result from a nuclear attack. This vision still captivates many in the political and military community as demonstrated by President Reagan's call to the scientific community to "render nuclear weapons obsolete."[1]

Research on possible defenses against ballistic missiles began shortly after Nazi Germany used the first guided missile - Buzz Bombs and V2 rockets - against England during World War II. The rapid development of radar detection and tracking technologies, command and control equipment, as well as nuclear weapons enhanced the feasibility and desirability of full scale ABM research and development. Bell Laboratories, under contract to the Department of Defense, concluded a study in 1956 on various components that were necessary for the

development of an ABM system. Bell laboratories indicated that some level of destruction against ballistic missiles was possible. By 1962, the U.S. had developed an ABM system with which it believed a national defense might be built. During the same year, a U.S. Nike-Zeus ABM interceptor was fired over the Kwajalein Atoll at an incoming missile reentry vehicle launched from Vandenberg Air Force Base. While the Nike-Zeus did not intercept the reentry vehicle directly, the Army reported that it came close enough to destroy the target had a nuclear warhead been employed.[2] This event formally entered the ABM into the strategic nuclear debate.

The tremendous potential for national destruction that the offensive nuclear forces of the U.S. and Soviet Union could unleash provided a military and political impetus for ABM research and development. In addition, there was a solid moral imperative for an ABM defense as it was difficult to rationalize the 'balance of terror' that threatens the superpowers. Three major identifiable reasons led to the emergence of ABM defense. The first reason for the development of the ABM was the military's desire for effective defenses against the ballistic missile. Second, the U.S. government saw its responsibility to protect the nation and prevent the type of destruction that would result from a nuclear attack. Lastly, it is morally repugnant for the nation to be vulnerable to a nuclear attack that might cause millions of deaths. These more general justifications for the ABM held sway until the mid to late 1960s.

The strategic nuclear balance of the early 1960s closely resembled a David vs. Goliath equation, where the U.S. was clearly the

Goliath in numbers of nuclear forces as well as related employment capabilities. The 'missile gap' scare of the early 1960s had spurred the Department of Defense to begin procuring a large number of deliverable warheads and an array of delivery vehicles which by the early 1970s included roughly 1,000 ICBMs, 41 strategic nuclear submarines, and a fleet of B-52 strategic bombers. These strategic forces afforded the U.S. a certain level of freedom in its foreign affairs and some strategic and political leverage in international crises. For instance, U.S. strategic nuclear superiority relative to the Soviet Union among other factors clearly influenced the Soviet Union's decision to withdraw its intermediate range ballistic missiles (IRBMs) from Cuba in 1962. However, the Cuban missile crisis taught the two superpowers the necessity of stabilizing their nuclear relationship. The mutual national vulnerability that each superpower recognized more clearly after the Cuban incident further prompted strategists to question the danger of the threat of nuclear war to U.S. security. The ABM was portrayed in this context as a potentially effective means of reducing the U.S.'s vulnerability to a nuclear attack, thereby enhancing U.S. security.

The reality that the nation is vulnerable to a nuclear attack is as compelling a reason for deploying defenses today as it was in the early 1960s. Various projections of the numbers of fatalities with and without an ABM defense were made. The number of American deaths from an all out nuclear exchange between the two superpowers was estimated by the late 1960s at around 100 to 120 million without the protection of an ABM system. Studies also projected that at least 75

percent of the U.S.'s industrial capacity would lie in ruin after a nuclear exchange. Clearly, these figures are tantamount to complete national destruction. An ABM defense capable of lessening these levels of destruction was seen as militarily valuable to ABM proponents. However, anti-ballistic missile opponents pointed out, in response, that an ABM defense was unlikely to lower the level of damage significantly as an attacker could simply increase the size of an attack in order to achieve similar results.

The ABM debate of the 1960s stirred the U.S. military planning and policy community to consider significant changes to U.S. deterrence policy and force structure. The character of the arguments for and against the ABM was indicative of the larger debate over the future direction of U.S. nuclear policy. That policy, having evolved into a policy for massive retaliation during the 1950s, was increasingly less credible in the eyes of U.S. strategists by the early 1960s. In addition, the U.S.'s shift in favor of a more flexible nuclear policy was influenced by the growth in Soviet nuclear capabilities, the birth of an arms control theory in the early 1960s, and the changing perspective on U.S. security requirements which included the concept of ABM defenses.

I. Arguments for the ABM

The success of the ABM development program, highlighted by the successful Nike-Zeus reentry vehicle intercept, greatly boosted the hopes of ABM advocates that the U.S. would integrate an ABM system into its strategic arsenal.[3] Meanwhile, the Kennedy Administration

initiated a general nuclear policy review. The primary focus of this review was to ensure that U.S. nuclear superiority remained intact while allowing for generally greater flexibility. The first U.S. ABM system was proposed as a means of enhancing U.S. nuclear superiority and overall strategic defense capabilities. During the early 1960s, a number of ABM proponents envisioned a U.S. strategic offensive and defensive posture capable of limiting damage to the United States in the event of a nuclear attack. A strategy for damage limitation might be implemented to limit the potential damage to the U.S. from a nuclear attack as well as to help preserve U.S. political flexibility in its foreign relations. It was argued that by assuring that the U.S. could survive a nuclear attack, few nations would threaten to use nuclear weapons against the U.S. for political or strategic gain. A U.S., defended by an ABM system as well as civil and air defenses, could continue to contain Soviet aggression and respond to international incidents, both militarily and politically, without threatening a massive military retaliation as envisioned during the 1950s. Anti-ballistic missiles were seen as a critical component of a damage limitation strategy.

President Kennedy and Secretary of Defense Robert McNamara concluded that the technical impediments to defeating even marginally modified offensive forces were too many and decidied to drop the idea of a meaningful damage limitation strategy. The military establishment quickly sought to define a new role for the anti-ballistic missile. For a short period of time, civil defenses were advocated in place of the Nike-Zeus ABM as a potentially

effective means of limiting damage to the U.S. population. However, the civil defense program was assessed to be only marginally effective without the concurrent deployment of an effective ABM system. McNamara concluded that the U.S. could not hope to maintain strategic nuclear superiority through a damage limitation strategy as an effective damage limiting capability was not technically feasible. As a result of McNamara's assessment, the Department of Defense shifted the focus of ABM defense research toward less comprehensive and less demanding defense missions.

Although criticized as only marginally effective at best, the ABM had become an important program to the military establishment. The Department of Defense began to explore the possibility of using the Nike system for other than wide area defense. While this shift was effected on paper, the ABM systems were upgraded by the introduction of more technologically sophisticated components. McNamara concluded that the capabilities of the superpowers' nuclear forces were likely to continue to expand and improve but that the trend was toward their becoming similar in overall capability. Central to this trend was the growth of the Soviet offensive nuclear arsenal and a leveling off in the number of forces deployed by the United States. Hence, the U.S. could not expect to maintain nuclear superiority through the deployment of ABM defenses alone.

United States strategic policy, predicated on the maintenance of deterrence, had entered a period of transition in the early to mid 1960s. That period, which lasted until the mid 1970s, saw U.S. policy reject the strategy of a massive retaliation and accept an assured

retaliation or minimum deterrence mode. Concurrently, the U.S. concluded that it did not require strategic forces above those already scheduled for deployment. In addition, the Soviet buildup was not expected to achieve weapons levels similiar to those of the U.S. until the early to mid 1970s. This evolution in U.S. policy and its corresponding strategies are often associated with the concept of "Mutual Assured Destruction".

As U.S. policy began to reflect and accept the growing equality of strategic force capabilities between the superpowers and, correspondingly, reject the notion of preserving U.S. strategic nuclear superiority, the debate over the possible roles for an ABM defense was enlivened. Proponents, fresh from the defeat of the Nike-Zeus, continued to promote the development of the ABM to meet other defense missions. Principal among these was the prevention of national devastation from a nuclear attack. The ABM's role might be to protect certain population centers or U.S. strategic offensive nuclear forces. The protection of U.S. strategic nuclear forces was viewed as a means of augmenting the U.S. deterrent and preserving its credibility. However, the Nike program was geared primarily toward a population defense and was not as effective for a defense of military installations.

As alluded to earlier, one lesson of the Cuban missile crisis was the need to promote and preserve a stable nuclear balance. As U.S. offensive forces reached a relative plateau in the late 1960s (1,000 ICBMs, roughly 500 SLBMs, and nearly 500 strategic bombers; and approximately 1,000 ICBMs, 125 SLBMs, and 150 long range bombers in

the Soviet arsenal), many U.S. analysts argued that promotion of a stable strategic balance was not only essential, but would require protection against the threat of counterforce weapons. The Kennedy and Johnson Administrations had concluded that the U.S. possessed sufficient force to preserve U.S. security and promote a stable balance without deploying an ABM defense. However, uncertainty over the future posture and size of Soviet counterforce systems convinced the Nixon Administration to support the redirecting of the ABM program toward development of a more dedicated counterforce ABM defense. Proponents began to argue that the ABM was essential to the survivability of the U.S. retaliatory nuclear forces as the U.S. had already decided not to match the Soviet buildup in offensive forces.

New offensive deployments by the U.S. were assessed as unnecessary and potentially destabilizing to the strategic balance. That is, the U.S. concluded that an increase in U.S. offensive capabilities might precipitate a weakening of strategic stability in a crisis situation or lead to an arms race. In addition, another crisis similiar to the Cuban incident could pit the U.S. against a more capable Soviet Union. As such, an ABMs' role could be to prevent a successful Soviet counterforce attack. Analysts feared that a counterforce attack might degrade U.S. nuclear forces as to deny the U.S. the ability to carry out an effective retaliatory strike on the Soviet Union. An ABM defense also might provide the U.S. sufficient time to analyze the size and kind of attack the U.S. was facing and the appropriate U.S. response.

Proponents of the ABM argued that the U.S. had few alternatives

to an increasingly vulnerable offensive force under the then current conditions. However, U.S. forces deployed in the Triad were unlikely to have become vulnerable to a true disarming counterforce attack. Strategic analysts who favored the Safeguard ABM system argued that Soviet nuclear weapons like the SS-9 ICBM were designed for counterforce attacks and could seriously damage U.S. nuclear forces. The warhead carried by the Soviet SS-9 ICBM (10 to 15 megatons in the single warhead version and 5 megatons in a three warhead MIRVed version) and its improved accuracy (.5 nautical miles) over older Soviet ICBMs worried Pentagon strategists that the U.S. Minuteman ICBM force would become vulnerable to a counterforce attack in the early to mid-1970s.

One option for countering a counterforce threat might have been to institute a Launch-on-Warning policy. Under this kind of policy the U.S. could launch its missiles once incoming Soviet nuclear missiles have been positively detected and identified. However, this policy is fraught with potential disaster should the U.S. launch as a result of a false detection. Secondly, in the event of war, the escalation process (whereby a nuclear war might be limited, if it can be controlled at all) would have been precluded. In sum, a Launch-on-Warning policy would place a U.S. nuclear response on a 'hair trigger' basis. The options for implementing a Launch-on-Warning or launch-under-attack policy (LOW and LUA, respectively) reappeared in the late 1970s as the U.S. strategic community began to debate the so-called 'window of vulnerability'. While these options illustrate the feasibility of adjusting policy to

meet new threats, they also demonstrate the ever dynamic role of technology. As in the late 1960s, the U.S. has reconsidered deployment of an ABM defense to protect its strategic weapons judged increasingly vulnerable to a Soviet attack.

A favored alternative of ABM proponents to a vulnerable ICBM force was the deployment of an ABM defense around missile silos. The objective of such a defense would be to allow the U.S. time to ride out an attack on the assumption that the ABM system would degrade an enemy's attack sufficiently to preserve U.S. retaliatory forces. Better use of the time available for detection and tracking of incoming missiles might enable the U.S. to evaluate which of its forces it might want to launch before the attack has hit and which could be held back for a retaliation. In this fashion, the U.S. could attack the Soviet Union's remaining missiles as well as other military and political targets more effectively by allocating its nuclear forces appropriately. From the proponents' perspective, the ABM would help protect the nation and preserve a credible deterrent force. That is, proponents were certain that an ABM defense could help to deter a Soviet nuclear attack and protect the U.S. better than the maintenance of a military posture without defenses.

The Pentagon and Joint Chief of Staff (JCS), owing in part to their air defense experience, were solidly behind the notion of an 'area defense' role for the ABM. An area defense ABM system is designed to protect major cities, industrial centers, as well as nuclear forces. However, this type of comprehensive nationwide defense was beyond the U.S.'s technical capability in the late 1960s.

One of the major obstacles traditionally associated with the development of a defense has been the definition of an acceptable level of effectiveness. The ABM technology associated with the Sentinal and Safeguard systems would not have been able to achieve very high kill rates against Soviet reentry vehicles. Yet, the systems were judged capable of degrading an attacking ballistic missile force by some measure.

The level of effectiveness required to deploy an ABM is dependent on the defense objective sought by the deployment. The Sentinel ABM defense, largely an area defense, was considered incapable of handling a large Soviet offensive force modified with penetration aids. For example, neither Sentinel or its predecessors (Nike-Zeus and Nike-X) were judged to be effective against a sophisticated saturation attack which might include the deployment of dummy warheads and MIRVs.

A number of ABM advocates, such as Herman Kahn, pinned their hopes on a 'thin defense' similar to the Safeguard system eventually deployed. While Safeguard was essentially a redesigned and renamed Sentinal ABM defense, it was promoted as an effective means to provide an ABM infrastructure for the United States. The initial deployment scheme for the Safeguard defense was to include 15 to 20 site defenses. The current defense debate often confuses a 'thin defense' with the concept of point defenses. Point defenses, such as the LOADS system, have been advocated in connection with the deployment of the MX ICBM as a means of enhancing its survivability. Point defenses serve to protect selected important targets such as strategic weapons components or related command-control- communication nodes. The 'thin

defense' was envisioned as a basis for the deployment of an 'area defense' at a later date and would have started by protecting sites such as U.S. missile silos. Safeguard's second phase was to include a system upgrade and additional deployments to compose a more comprehensive nationwide defense sometime in the late 1970s.

ABM advocates also promoted the idea that a 'thin defense' could increase U.S. security by protecting the nation against an accidental or third country attack. Although a somewhat lower threat to U.S. security at the time, the proliferation of nuclear weapons was expected to continue. The possession of nuclear weapons by a greater number of countries could lead to a commensurate increase in nuclear threats. Defense against small third country attacks could have been mounted fairly successfully with the Safeguard system. The Johnson Administration, under political pressure to save the ABM as a result of congressional criticism, advocated deployment of the Sentinel ABM system as a defense against Chinese nuclear forces. China's strategic nuclear forces were assessed to be developing quickly enough to become a significant threat to the U.S. by the mid-1970s.

Finally, a number of government officials such as Secretary McNamara saw the ABM defense as a potentially effective strategic and political lever for the arms control talks. McNamara had argued that an all-out strategic offensive and defensive arms race was potentially the most destabilizing threat to the strategic nuclear balance. A number of analysts, seeking to prevent an arms race, argued that any means of gaining leverage in the arms control talks could be strategically useful. The Soviets had begun to deploy an ABM defense

around Moscow in the mid 1960s and many saw this development along with their growing ICBM forces as a challange to the U.S.'s nuclear position and a possible bid for superiority. This prospect was considered extremely threatening from a strategic and political perspective. ABM proponents argued that deployment of an ABM defense by the U.S. could strengthen its strategic position and provide the necessary flexibility in dealing with the Soviets in the arms limitation talks.

While the preceeding arguments greatly influenced the decision to go forward with the Safeguard deployment as well as the ABM Treaty, the positions of ABM opponents were equally compelling and also influenced the future direction of U.S. deterrence policy in the 1970s.

II. Arguments against the ABM

The flurry of ABM advocacy in the 1960s created an equally active and vocal opposing constituency. A number of arguments against the ABM defense scheme emerged from challenges that the abm was strategically misguided to claims that it would be entirely cost ineffective. While some of these arguments pointed to so-called 'critical flaws' in the system's technology, others criticized the overall concept of defense against nuclear weapons. central to the critics' charges was a belief that nuclear weapons could not be conceived of in any role other than the preservation of deterrence. That is, many believed it was irrational if not dangerous to tamper with the superpowers' strategic offensive forces -- or their ability

to threaten an enemy -- which served as the foundation of deterrence.

The most influential and persuasive of the arguments against the ABM stemmed from a set of strategic assumptions and principles concerning the nuclear balance of the 1960s.

The initiation of a strategic nuclear exchange, purposefully or by accident, would result in an immeasurable level of human and material destruction. For example, the U.S. had begun preparations in the 1960s for the destruction of one third of the Soviet Union's population and nearly two thirds of its industrial base. the scope °of this destruction clearly impressed most policy makers that nuclear war was simply not winable. Measures of success and failure might have been imagined but were simply unrealistic and irrelevant for opponents of the ABM. Given these conditions, the first principle concerning nuclear war for ABM opponents was that a nuclear war simply could not be won. While this does not imply that ABM proponents believed that a nuclear war could be won, opponents could forsee no use for an ABM as a result.

The purpose and roles of warfare in national policy was forever altered by the development of nuclear weapons. The major impetus to this conviction was the force and credibility that nuclear weapons provided offensive warfare as compared to defensive warfare. In the opinion of most analysts, the level and intensity of violence capable of being unleashed by a nuclear weapon is so great as to preclude the use of nuclear weapons and restrict the frequency and intensity of warfare (both conventional and nuclear) for the superpowers.

Offensive warfare acquired a level of destructive intensity far

superior to known defenses in the 1940s and 1950s. There are almost no defenses against a nuclear explosion, hence an attacker simply requires an effective delivery system to obtain an advantage over an enemy's defenses. Opponents of the ABM took this argument one step further by charging that so long as a nuclear war could not be won and nations are unable to effectively defend against a nuclear attack, nations are caught in an offensive stalemate. That is, all nations were effectively vulnerable to a nuclear attack. Furthermore, opponents argued, in order to ensure that a devastating nuclear war would not break out, the U.S. must turn the argument on its head and attempt to preserve the offensive 'balance of terror'. Hence, it would be the responsibility of each nation, having accepted the preceding tenets as fact, to remain attuned to the strategic offensive balance in order to prevent its weakening. A weakening of the balance could occur as a result of a nation seeking advantages over other nations or by the deployment of defenses against nuclear weapons.

The most secure position in this regard, one which accounted for the condition of an unavoidable balance of terror, is one which promotes a stable balance. To opponents of the ABM, this position is obtainable only to the extent that each superpower refrains from seeking nuclear superiority. Although strategic nuclear superiority may be meaningless from a strategic and political perspective, attempts to achieve it can destabilize the strategic balance and lead to war in a severe crisis. For most strategic analysts the most effective stabilizing measure was the preservation of an invulnerable offensive nuclear force. ABM opponents were particularly concerned

that any missile defense might challange the invulnerability of strategic forces and thereby destabilize the strategic balance.

One method of enhancing stability within the strategic balance would have been agreements toward disarmament. However, neither superpower was politically or strategically willing to disarm for fear of clandestine weapons deployments as well as third party threats. Given these conditions, a stable 'balance of terror' might be preserved if the superpowers seek to maintain a secure second strike retaliatory force and avoid forces capable of threatening the other's nuclear arsenal.

Lastly, all measures designed to escape the balance of terror might be seen by an enemy as an attempt to prepare for a nuclear exchange and to limit one's damage from a war. Since such efforts, according to ABM opponents, are clearly irrational and dangerous, these preparations can only be regarded as provocative and destabilizing to the strategic balance.

While these more abstract arguments were considered important by decision makers, the most concrete and salient arguments against the ABM appear to have focused on the technical merits of the system's structure. The structural design of the most advanced ABM systems of the 1960s, the Sentinel and Safeguard programs, were a result of the dissatisfaction with the technology of the original ABM program, the Nike-Zeus. The Nike program depended on relatively unsophisticated technology including rotating tracking radars, high altitude interceptors of marginal maneuverability, and very large nuclear kill mechanisms. The assessment that the Soviet Union's offensive forces

could saturate or confuse these systems resulted in their cancellation. The follow-on ABM system's structure was designed to overcome the major flaws of the Nike program.

Both Sentinel and Safeguard were structured around two interceptor missiles and a network of phased array radars. The Spartan ABM was a direct follow-on to the Nike program. Like the Nike interceptor, Spartan was a high altitude interceptor which carried a large megaton yield nuclear warhead designed to kill by x-ray emissions above the atmosphere.[4] That is, the warhead was designed to create large areas of debris and x-ray disturbances that would cover the path of an attacking reentry vehicle thereby destroying it. This area is generally referred to as the kill radius of the defense interceptor. The Spartan system's terminal defense interceptor, the Sprint missile, was designed to destroy warheads that had penetrated Spartan exoatmospheric defenses. The Sprint was capable of intercepting within 40 miles of the defended target and carried a kiloton range warhead. Although the dual interceptor defense system was considered a significant improvement over the modest Nike program, advances in sophisticated penaids and saturation tactics further hampered the Department of Defense's effort to deploy the ABM from a technical perspective.[5]

The ABM system's major strategic flaw was its focus on area defense. Area defense demands an extremely high level of effectiveness if not perfection. A single penetrating warhead over a major urban area can cause thousands and possibly millions of deaths and tremendous material destruction. The ABM systems were unable to

fit the original damage limiting objective and were, therefore, marginally useful from this perspective.

While many critics charged the system with technical fallibility, others merely referred to probable Soviet measures to degrade the ABM's effectiveness as a sufficient reason not to deploy. "Most critics of the ABM technology were really referring to the fact that a modified Soviet nuclear force could outwit and overwhelm an ABM system. That is, although Safeguard could have handled a small Soviet attack quite effectively, it would be relatively cheap and easy to nullify an ABM defense".[6]

Two major categories of offensive countermeasures were already envisioned in the early 1960s. The first category is generally labelled 'passive' measures where improvements are made to the ballistic missile. The Sentinel and Safeguard systems would have had to adjust to a profusion of offensive enhancing hardware. These countermeasures included technical improvements to the ballistic missile as well as measures designed to confuse an ABM's tracking and designation system. Metal sheets or chaff, dummy warheads, and balloons could confuse the ABM system's discrimination capabilities and proliferate the number of targets the system would be required to handle, thus improving the chances that the real warheads would penetrate and destroy their targets.

Among the most important active countermeasures developed by the U.S. was the MIRVed warhead. The basing of multiple warheads on a single ballistic missile greatly complicates the job of an ABM defense by expanding the number of targets it is required to kill in order to

maintain its original level of effectiveness. The measurable level of ABM effectiveness can be judged by the percentage of reentry vehicles it is capable of destroying. This level can be degraded and is generally a function of the number of warheads deployed on each missile and the difficulty of detecting and tracking them.

Another deadly countermeasure is the designation of certain warheads to detonate on impact with an ABM defense interceptor. This kind of tactic allows the attacker to achieve some measure of destruction against a target and also can blind the ABM radars allowing other reentry vehicles to penetrate the defense. Generally, a measurable level of target destruction can be achieved only by detonating the nuclear weapon within the atmosphere. Therefore, detonation of the warhead upon impact with the ABM inteceptor can achieve only some offensive success when engaged by endoatmospheric interceptors. Detonation outside the atmosphere may clear a path through which other reentry vehicles can penetrate.

The second category of countermeasures includes efforts that might be called tactical. The Soviets could reduce the impact of the ABM's kill radius by employing special angles of attack, either low, high, or varied and staggered trajectories, thereby escaping a part of an ABM's effective range. The Soviets also might attempt salvo and successive attacks to challenge the ABM's radar and missile launch timing capabilities.

Although the technical arguments were sometimes inaccurate on both sides of the debate, the more important issues were only so to the extent that the technical arguments remained unresolved. The

strategic implications of a deployable ABM rested, in part, on the level of kills achievable by the defense. Proponents had concluded that an ABM would enhance U.S. security by degrading the level of damage the Soviets could expect to achieve in any attack. Critics, on the other hand, addressed this point by charging that such a degradation in Soviet offensive capabilities would quickly lead to an action-reaction cycle and a renewed and vigorous arms race. The deployment of an ABM defense that might reduce the retaliatory capabilities of Soviet nuclear forces could lead to the proliferation of greater numbers of offensive nuclear weapons as the Soviets seek to regain any lost capability. This proliferation, they charged, would result in an increase in the destructive power of the superpower's nuclear arsenals. In addition, an increase in offensive nuclear force would not enhance U.S. security, but only decrease it by making the balance of nuclear forces more precarious and less stable.

A principal assumption of this argument is the belief that only "offensive nuclear forces can be relied upon to preserve the nuclear balance" and assure that the Soviet Union is deterred from attacking the U.S. or its allies.[7] That is, any lessening of the credibility of the U.S.'s or Soviet Union's second strike retaliatory forces by the deployment of an ABM is sure to be seen as a weakening of deterrent capability. As neither superpower could accept this condition, the development of measures to reenforce offensive retaliatory capability are likely to be required. Under these conditions, the balance of power might begin to tilt in favor of one or the other superpower thereby potentially destabilizing a crisis to the point where one

superpower attacks. The list of technical and tactical measures, mentioned above, have been presented as some of the major avenues for redressing a loss of deterrent credibility. Critics of the ABM emphasized that one of the quickest and most effective countermeasures to an ABM deployment would involve the simple expansion or fractionation of offensive forces. These countermeasures could be achieved by MIRVing ballistic missiles or by deploying greater numbers of missiles, launch vehicles, and/or reload capabilities.

The most dangerous threat to the nation's security that could result from an ABM deployment is the possibility that nuclear weapons could be used in a severe crisis. Assured destruction theorists charged that the deployment of an ABM system would be perceived as an attempt to limit damage and achieve some measure of nuclear superiority and that this goal is highly destabilizing. While a U.S. ABM system might be ineffective against a concerted and large scale Soviet attack, it might be effective against a degraded and interrupted retaliatory attack. Hence, deployment of a U.S. ABM system concurrently with a counterforce capability could lead the Soviets to feel threatened with decapitation from a U.S. attack. As a result, the Soviets might attack during a crisis to preclude a defeat. The Soviets could launch a first strike in order to limit damage to the Soviet Union and prevent an 'all or nothing' response in anticipation of a U.S. attack. That is, the Soviets might expect to have the choice between a greatly degraded and potentially poorly coordinated retaliatory attack or an all-out attack on U.S. cities after an initial U.S. strike. Hence, the incentive to launch a

surprise first strike in a crisis might be heightened by a U.S. ABM deployment. These conditions are characterized as instability while the general concept is known as 'crisis stability' as opposed to 'strategic stability'.

The preceeding arguments, both pro and con, concerning the ABM in the 1960s raised a number of questions about U.S. deterrence theory. These questions led to a number of decisions with which the current BMD debate is contending -- the U.S. decided to forgo an area defense, to seek limits on defensive systems with the Soviet Union, and to reenforce offensive deterrence by a policy of assured destruction. Given these decisions, it is instructive to explore the commonalities and differences between the current defense debate and the 1960s debate to understand the decisions that may follow the current debate.

III. Implications of the Early ABM Debate

The preceding analysis provided a basis for discussing the implications of the original ABM debate for U.S. strategic nuclear policy. As the events and decisions surrounding the ABM in the 1960s and early 1970s influenced profoundly the substance of U.S. policy for the past fifteen years, so too will the defense debate today influence the course of U.S. policy for the next fifteen years. The implications of the original debate for U.S. policy during the 1970s can be helpful to understanding how the SDI might affect U.S. policy in the late 1980s and 1990s.

U.S. strategic nuclear policy is composed of four major substantive divisions. Each policy division addresses a different but

related set of issues concerning the way in which U.S. defense strategists and policy makers view the threat of nuclear war, the types of strategic nuclear weapons the U.S. requires, its arms control positions, and, finally, the manner in which the U.S. might engage an enemy in a nuclear exchange should deterrence fail.

Of the four substantive policy components, "the most public and most widely discussed . . . is U.S. strategic declaratory policy. It is comprised of a set of principles and arguments about our nuclear posturing and our position vis a vis other nuclear powers."[8] In other words, it is a set of 'first principles' which state how the U.S. looks at deterrence, the strategic balance with the Soviet Union, and force postures that preserve the nuclear balance. For example, "the U.S. has always argued that a nuclear war will result in unimaginable damage to the parties involved" and, "therefore, seeks a policy that assures that a nuclear war will not be fought."[9] During the 1950s, this notion was affixed to U.S. policy through declarations that the U.S. government would respond to a nuclear attack with a swift and massive nuclear retaliation. Such statements provide an understanding of U.S. declaratory policy as a public means for deterring a nuclear attack. The policy for massive retaliation and its operational strategies were backed by a comparatively large nuclear force comprised of long-range strategic bombers, intermediate-range ballistic missiles, and a small number of ICBMs. Illustrative of this declaratory dimension of U.S. policy were periodic nuclear exercises, designed to demonstrate U.S. deterrence resolve and capability.

A debate over the appropriate nuclear policy for preserving U.S.

security emerged in the early 1960s and lasted until the late 1960s. This period was filled with doctrinal as well as strategic options for altering U.S. deterrence policy, one of which appeared as the ABM defense came to prominence.

United States strategic nuclear superiority was unquestionable during much of the 1960s at levels of three and four times the size of Soviet nuclear forces. That is, the U.S. could inflict between three to four times the damage on the Soviet Union as the Soviet Union could inflict on the U.S. as a result of a larger U.S. nuclear arsenal. While the levels sound impressive, the Soviet Union was quite capable of causing extremely high levels of damage to the U.S. population and economic base. The U.S. was free to explore new policies without having to fear that these actions might weaken the Soviet Union's perception of the U.S. deterrent. Yet, the Soviet Union's effort to catch up with the U.S. in numbers of weapons after the Cuban missile crisis implied that the U.S. lead would not last without U.S. countering actions. One option would have entailed efforts to preserve U.S. nuclear superiority. Yet, such an effort would have been extremely expensive and fraught with political hazards, as the U.S. was then becoming more deeply involved in the Vietnam war. The U.S. was faced with deciding whether to match a greatly accelerated Soviet nuclear buildup subsequent to the Cuban missile crisis, in order to maintain its margin of superiority, or to do something else to prevent the Soviets from catching up.

One of the proposed alternatives for maintaining U.S. nuclear superiority was a 'damage limitation' strategy. In this case, U.S.

nuclear policy would focus on deterring Soviet aggression through a U.S. offensive nuclear posture, but also by assuring that the level of damage the Soviets could inflict on the U.S. could not surpass the level of damage with which the U.S. could retaliate. This strategy was designed to preserve U.S. nuclear superiority by procuring a damage inflicting capacity far greater than any potential aggressor. In the early 1960s, the Kennedy Administration briefly entertained a 'damage limitation' policy, but decided against it for a number of political and strategic reasons.

Schilling has argued that "a damage limitation strategy would have required the U.S. to develop and deploy counterforce weapons, an active defense component comprised of ABMs, air defenses, and sophisticated anti-submarine weapons, and passive civil defenses."[10] The arguments in favor of a 'damage limitation' strategy were compelling to some analysts in view of the Soviet nuclear buildup. Yet, U.S. technical prowess in each of these areas was judged inadequate for achieving a true counterforce damage limiting capability. Schilling concluded that, "by the mid to late 1960s, the ability of the U.S. to add significantly to its damage limitation capability by adding only to its offensive forces was judged limited. As well, there was no certain way to destroy Soviet submarine-launched ballistic missiles. Through the deployment of MIRVs, the U.S. would have achieved some capability against Soviet ICBM forces and strategic bomber bases, yet this capability could only be exercised through the use of a first strike".[11] It is not hard to understand why "there was little support for proceeding to this type of posture".[12]

The key to a damage limitation policy and strategy was the addition of defensive systems. In particular, an effective ABM was considered critical to the success of this strategy. Yet, the U.S. decided against the deployment of a comprehensive ABM defense, because of the numerous technical reservations, as well as against a vigorous civil defense and air defense program. The value of civil and air defenses was assessed to be directly related to the scope and effectiveness of an ABM defense. Since the U.S. decided against a comprehensive ABM defense, both civil and air defenses appeared to make little sense by themselves. Schilling has stated that "by not deploying damage limitation defensive systems, rather than failing to maintain some ratio or margin of offensive force, the U.S. lost the opportunity to maintain nuclear superiority."[13] It is questionable whether the U.S. really lost the opportunity to maintain superiority or whether superiority simply could not be maintained in the nuclear environment once the Soviets had decided to procure a mature nuclear arsenal.

Meanwhile, a policy for preserving offensively based deterrence became increasingly persuasive. The theoretical focus behind this doctrine was the theory of mutual assured destruction. According to Donald Brennan, this theory argues that "since we could not effectively defend against each other, the threat of societal destruction was unavoidable, and each side had to deter the other with large offensive nuclear forces".[14]

The central precepts of U.S. strategic nuclear policy which resulted from this period of debate were codified by the 1969 National

Security Council decision to christen a deterrence policy of 'strategic sufficiency.' "The central elements" of 'strategic sufficiency' "for U.S. declaratory policy was the maintenance of strategic forces capable of assured destruction."[15] The principal arguments for assured destruction strategy in the context of strategic sufficiency were the following:

"1. It should deter a nuclear attack upon the U.S. so long as the Soviet Union believes it will be destroyed by a determined U.S. retaliation to such an attack.

2. It should permit the U.S. to pursue its foreign policy up to the point of direct confrontation with the Soviet Union.

3. It should reduce the reasons for an arms race".[16]

The critical component of this policy rested on the maintenance of a secure second strike capability to inflict massive destruction on the Soviet Union's urban and industrial target sets. During the 1960s, Secretary of Defense McNamara identified assured destruction with the ability to destroy 35 percent of the Soviet Union's population and 66 percent of its industrial resources.[17]

Effectively, this policy focused on the reality that the superpowers were vulnerable to a nuclear attack and that this fact might act as the means of deterring an attack by either superpower. It also owes much to the recognition that an assured retaliation posture is composed of easily procured and maintained deterrent forces. The theory stipulates that the "naked vulnerability" of the superpowers "makes the use of nuclear weapons less likely and will tend to foster mutual understanding".[18] The theory further suggests, that so long as mutual

national vulnerability remains the preeminent condition of the nuclear balance, there are few feasable alternatives to mutual assured destruction. Brennan has argued that mutual assured destruction (MAD) sets up the possibility for a distorted form of deterrence. "Since we must deter we can not defend and hence we must limit ABM defensive deployments to maintain MAD."[19]

The ABM decision, in the context of the strategic policy debate that ended in the dominance of a theory of strategic sufficiency, effectively meant that the Soviet Union would be free to develop a damage inflicting capability equal to that of the U.S. by the 1970s. The U.S., in other words, decided against efforts to maintain its nuclear superiority because an effective ABM system and other measures to achieve that end were unavailable and potentially dangerous. The U.S. resolved its declaratory policy debate by settling on a policy for 'strategic sufficiency' that rested on the tenets of the concept of mutual assured destruction which, in turn, suggested that the U.S. forgo meaningful ABM defenses. However, the theory also suggested that any ban on ABMs must be mutual. While the language of U.S. declaratory policy has changed somewhat since the early 1970s, the basic focus of this policy has remained intact. The U.S. continues to emphasize the unwinable nature of nuclear war and project a capable U.S. willing to deter Soviet aggression. The Reagan Administration appeared to alter U.S. declaratory policy in the early 1980s by discussing the possibility of nuclear war in Europe, but has returned to the more sensible public stance.

The second policy division concerns the types of strategic weapons,

their capabilities, and mission requirements that the U.S. develops. United States force development policy has been guided by the policy of 'strategic sufficiency' for most of the post-ABM period. It has essentially required the U.S. to maintain a strategic force equal in capabilities to those of the Soviet Union. In other words, "the U.S. decided that it would allow the Soviets to achieve parity in nuclear forces, but that it could not allow the Soviets to gain an ability to inflict considerably greater damage on the U.S. than the U.S. could inflict on the Soviet Union."[20]

The focus of decision making in the policy area subsequent and in conjunction with the decision to deploy a limited Safeguard ABM defense concerned the issue of whether or not the U.S. would attempt to match the Soviet offensive buildup. The ABM decision implied that the U.S would continue to rely primarily on its offensive forces to deter a Soviet attack. The U.S. decided that its nuclear forces would continue to be sufficiently capable of carry out an assured destruction strategy well into the 1970s. Hence, an increase in the size of the U.S. nuclear arsenal was considered unnecessary and viewed as potentially destabilizing to the strategic balance and an impetus to the arms race. Yet, the requirements for enhancing U.S. flexible options in its force employment policy meant that the U.S. had to continue to modernize and upgrade the capabilities of its offensive forces.

One of the most important issues in the U.S.'s debate of whether to upgrade its nuclear forces revolved around the decision of whether to MIRV its offensive forces. The potential effectiveness of ABM defenses against a limited retaliatory attack and Soviet efforts in the ABM area

led U.S. strategists to conclude that MIRVs were a valuable strategic force enhancement. The added penetration capability that MIRVs could provide U.S. forces against existing Soviet ABMs or future defenses was the principal impetus to their deployment. In effect, MIRVs were viewed as consistent with U.S. efforts to implement assured destruction policy and also would increase the flexible option requirements as outlined in the National Security Council memorandum which established a policy for 'strategic sufficiency'.

United States systems involved in the MIRV program were the deployment of the Minuteman III ICBM with three warheads and the Poseidon SLBM with up to 14 warheads. The U.S. arsenal began to receive MIRVed Minuteman IIIs starting in 1970 and MIRVed Poseidon SLBMs starting in 1972. In addition, the U.S. strategic bomber force was scheduled for limited modernization with the introduction of the FB-111 Bomber, a smaller, penetration capable weapon system as well as the incorporation of advanced technology to the B-52s in the early 1970s. The maturity of U.S. nuclear forces were reaffirmed after the ABM decision. United States forces would remain fairly evenly divided within the strategic triad of ICBMs, SLBMs, and strategic bombers. However, the number of deliverable warheads per force has shifted in favor of the sea-based component and less in favor of the strategic bombers. The forces were fully redundant and sufficiently reliable as a secure and credible assured destruction deterrent. The major characteristics of the U.S. nuclear arsenal as of 1970 are displayed in Table 1.

The third policy component is comprised of 'action policies' and is

referred to as U.S. nuclear force employment policies. These policies come into play should deterrence fail and a nuclear war begin. They encompass the group of strategies and tactics that would govern the use of U.S.

Table 1. U.S. STRATEGIC NUCLEAR FORCES: 1970

	Delivery Systems	Warheads
ICBMs:	1. 54 Titan II	54
	2. 500 Minuteman I	500
	3. 500 Minuteman II	500
SLBMs:	1. 16 Polaris Submarines	900 (est.)
Bombers:	1. 646 B-52s	5000 (est.)

nuclear forces during wartime. The U.S. has always taken precautions to prepare its nuclear forces for use in the event of war even though it publicly declares that the primary purpose of its force is to deter nuclear war and present the threat of retaliation to the Soviet Union should it attack. For example, the maintenance of forces capable of inflicting some level of damage on Soviet urban centers and economic assets has not meant that the U.S. has ignored the requirements for wartime targeting of other Soviet strategic assets. That is, "the U.S. has not defined its requirements for second strike targets solely or even mainly in terms of values such as population centers or Soviet

industry".[21] The concensus is that the U.S. has always targeted Soviet military assets and, as reported since 1974, the U.S. has not targeted Soviet population centers or industry, per se, but Soviet 'recovery resources' with a requirement to destroy 70 percent of these targets.[22]

The set of employment policies guiding the use of U.S. nuclear weapons in wartime are collectively known as the SIOP, or 'Single Integrated Operational Plan'. The SIOP contains a number of preplanned attack options which the U.S. can exercise in the event of a nuclear attack on the U.S. or its allies. Each option contains a pre-determined set of targets and attack sequences for carrying out a U.S. retaliation or pre-emptive attack. The SIOP is divided into several employment options which are defined by their target sets and the size and scope of the retaliation the U.S. would undertake.[23]

1. The first group of attack options could entail a U.S. strategic retaliation on "Soviet strategic nuclear forces of all types -- ICBMs and their silos, strategic SSBNs and their bases, strategic bomber bases, and IRBMs. Included in this target set would be Soviet nuclear weapons storage sites and airfields sufficient to support nuclear capable aircraft".[24] The objective of this kind of attack would be to cripple Soviet strategic forces and limit the damage Soviet forces could, in turn, inflict on the U.S. and its allies. The majority of Soviet strategic nuclear delivery systems are located outside Soviet population centers thereby holding down the civilian casualties from the prompt effects of a U.S. attack. However, the radioactive fallout from an attack, while its fallout patterns are unpredictable, is likely to be greater from ground bursts required to destroy hardened ICBM silos and

their command bunkers. Therefore, the level of collateral damage from a selective nuclear attack on Soviet strategic weapons could be high such that the attack would not be viewed by the Soviet leadership as limited.[25]

2. A second set of attack options would involve a U.S. retaliation against other Soviet military targets (OMTs) and resources located away from Soviet population centers. These targets would include major weapons storage sites and air defense components, such as their launchers, missiles and supporting radar sites.[26]

3. The third set of options would allow the U.S. to attack Soviet military forces and resources located near population centers such as military bases and concentrations of major weapons systems, ie. fighter aircraft.[27]

4. A fourth category of targets would include the Soviet command-control-communication network. The purpose of attacking these targets would be to interrupt Soviet battle and war management efforts.[28]

5. An additional employment option set would entail a massive U.S. retaliation on any or all Soviet assets including urban centers as a result of or precusor to spasm nuclear war.[29] Included in this set would be the option for pre-empting a Soviet attack if U.S. leaders felt sufficiently provoked and sure that the Soviets were about to launch an attack on the United States. This option recognizes the argument that under nearly any wartime condition, offensive surprise may prove to be a meaningful advantage.

As with any weapons system, offensive or defensive, "its usefulness

can only by judged within the criterion of clear and discrete military and political objectives designed to promote U.S. security."[30] The Sentinel ABM was considered insufficient, as an 'area defense,' in view of the political and military objective of preserving U.S. nuclear superiority without the requisite efforts in air and civil defenses and deployment of offensive counterforce nuclear weapons. In addition, the technological obstacles to a highly effective area defense were insurmountable as they may be today. The final decision to deploy the Safeguard ABM as a limited silo defense was made in light of the technological obstacles to an area defense as well as the domestic, political, and economic constraints on the President and Congress.

The ABM deployment decision was made in the context of the shift to the doctrine for 'strategic sufficiency' and its implications for U.S. strategic nuclear policy. Central to the doctrine for 'strategic sufficiency' was the preservation of flexible options as well as an assured destruction capacity. That is, U.S. political and military leaders decided that the political and strategic costs in attempting to maintain nuclear superiority were too great. The moratorium on widespread ABM deployments incorporated into the ABM Treaty and emerging Soviet nuclear parity in the early 1970s increased U.S. interests in preserving its flexibility in the event of war. The demise of an 'area' ABM defense prompted U.S. interest in providing itself a wider set of choices in responding to a Soviet attack. That is, the Pentagon feared a condition where a President had to choose between launching an all out massive retaliation against the Soviet Union or launching no retaliation at all.

With the advent of parity, the U.S. had less credible choices for adding to the range of choices with respect to both the timing and scale of nuclear exchanges with the Soviet Union.[31] The purpose of adding to the preplanned options in the SIOP is to prevent the need to rush to attack in a manner that neither addresses the military requirements nor deters escalation to wider and more intense conflict, if nuclear war can be limited at all. This set of ideas, originally introduced by Secretary of Defense McNamara, came to be known as Limited Nuclear Options (LNO) under the Nixon Administration. While it is in the U.S.'s interest as it is in the interest of the Soviet Union to limit an attack response in order to prevent all out nuclear war, the ability of the superpowers to limit such a war is questionable. In addition, the impact of limited nuclear options on the credibility of the U.S. deterrent is unknown. While LNO theorists claim that a range of options from limited to massive retaliation is more credible, the theory is dependent on assumptions of what is most likely to deter an enemy and what the enemy is likely to do in a war. The U.S. has developed and further refined options for selectively striking non-urban targets and holding the majority of U.S. offensive forces in reserve as a deterrent against more massive Soviet attacks on U.S. population centers.

These employment options and the associated upgrades to U.S. nuclear forces have been designed with the following major purposes in mind according to Werner Schilling:

1. To improve the U.S.'s ability to respond to limited attacks by the Soviet Union.

2. To improve the U.S.'s ability to initiate limited attacks

against the Soviet Union in the event of war. Flexible options are designed to:

A. Make the Soviet Union think about the risks they would be running by attacking the U.S. or its allies;

B. Deter the Soviets by attacking to destroy certain valued targets, and;

C. Make the Soviet Union lose by destroying their military forces".[32]

The final component of U.S. strategic nuclear policy is its arms control negotiating policy. The purpose of these policies "is to provide objectives with respect to the character and composition, in so far as it can be controlled, of the strategic balance and capabilities of U.S. forces in the balance."[33] One of the major requirements imposed on U.S. strategic nuclear policy by the policy of 'strategic sufficiency' was the objective of strategic and crisis stability. That is, it called for the U.S. to seek to maintain "a strategic balance that provides for crisis stability, a balance in which neither side has any incentive to strike first in time of a crisis. In effect, this balance would require that both sides perceive no difference between striking first or striking second either in terms of destruction it could cause or destruction it would receive".[34] A primary U.S. method for achieving a stable balance included efforts in the arms control arena, having judged an offensive arms buildup to otherwise be unnecessary and ABM defenses technologically immature and potentially destabilizing.

There were three major reasons that the U.S. focused on seeking limits to ABM defenses. Each of these arguments hinged on the

acceptance of a policy for mutual assured destruction. Arms control advocates argued that a cyclical action-reaction model dominated the arms race and as such, ABM defenses would only lead to an increase in offensive forces on both sides. In turn, the level of damage that might result from a nuclear war also would increase. Arms control advocates further argued that, once under way, an arms race was extremely dangerous and threatening to each nation's retaliatory capability as neither could judge precisely the effectiveness of the other's constantly changing offensive and defensive forces. Secondly, an arms race could be highly destabilizing to the strategic balance and create a dangerous environment during a crisis in which the incentive to strike may be increased. Finally, it was suggested that the U.S. could move to limiting offensive nuclear forces and thereby provide greater security for each nation by limiting ABM defenses. This, argued arms control advocates, could be achieved only if defenses were limited. In such a balance, there would be no need for more offensive forces if the superpowers accepted the tenets of mutual assured destruction.

The central questions with respect to the ABM Treaty were:

1. How could the U.S. prevent the arms race from getting out of control, one that might be stimulated by imperfect defenses?
2. How could the U.S. prevent the destabilization of the strategic balance?
3. How could the U.S. prevent the proliferation of nuclear weapons that might result from an intensified arms race?

Each of these questions was resolved temporarily by the 1972 ABM Treaty. As the defense debate rages today, the arms control issues of

the late 1960s and early 1970s have reappeared. The ABM Treaty severely restricted the deployment of ABM components -- interceptor missiles, launchers, radars, and mobile elements -- and only left room for research. It provided for an indefinite time for enforcement and a five year review schedule as well as a consultative committee for handling questions of violation and re-negotiation. The Treaty was regarded as the single most significant step toward preventing a dangerous and unrestrained arms race by both sides. The basic purpose was to promote a stable balance and provide an incentive for reductions in offensive nuclear arms. The Treaty sought to preclude the nullifying impact ABMs may have had on the superpowers' retaliatory forces.

Arms control advocates argued in the U.S. Congress that the ABM Treaty was a necessary step in order to bring about offensive arms control. J. Coffey stated that the costs of proceeding with an ABM deployment "as judged by proponents of limits on ABMs, was an erosion of possibilities of reaching an agreement on further arms control measures which could promote security."[35] Advocates believed that "deterrence would be enhanced through the ABM Treaty because it would help preclude any incentive to preempt through a first strike or attempt nuclear blackmail during a crisis".[36]

The ABM debate of the late 1960s was hard fought and indicative of the state of flux in U.S. strategic nuclear policy during that decade. Faced with the issue of deciding whether to preserve its nuclear superiority as well as a determined Soviet effort to upgrade its nuclear capabilities, the ABM was promoted both as a panacea and a harbinger of threat. An ABM defense may have enhanced the deterrent value of U.S.

nuclear forces to some extent. However, it was evident that a number of questions existed with respect to the potential for degrading U.S. security as a result of possible Soviet responses to a U.S. ABM deployment.

In sum, the ABM debate led to a number of alterations in U.S. strategic deterrence policy but did not lead to a fundamental shift in U.S. deterrence thought. The U.S. decided not to match the Soviet buildup in nuclear weapons in the late 1960s and the relative Soviet ability to inflict damage on the U.S. was greatly increased. The decision to seek limits on ABMs also contributed to the decision to do little to change the basic posture of U.S. offensive nuclear forces or their strategic roles as prescribed by assured destruction policy. This decision implied that the U.S. would accept strategic nuclear parity with the Soviet Union. United States nuclear policy, as codified in the doctrine for 'strategic sufficiency', meant the U.S. would not challenge the Soviet Union's efforts to achieve strategic nuclear parity should they choose.

Secondly, the U.S. sought to emphasize its assured retaliation posture while enhancing its flexible attack options in the event of nuclear war. This policy led, in part, to a number of upgrades in U.S. nuclear forces. As part of the nuclear modernization of U.S. forces, the U.S. began MIRVing its ICBMs and SLBMs in order to prevent a degradation to U.S. retaliatory capabilities in the event of a sudden upgrade in Soviet defenses at some later date and provide added capability to U.S. flexible options. Lastly, the U.S. decision not to deploy significant numbers of ABM defenses directly influenced and was

influenced by the role and scope of U.S. arms control efforts. Clearly, the Sentinel and Safeguard ABM systems were promoted, in part, as bargaining chips to achieve arms control agreements with the Soviets. The arms control process was perceived as one of the major avenues, if not the most important path, for securing a stable nuclear balance for well into the 1970s and a means of limiting the potential of the Soviet nuclear threat.

The ABM debate highlighted the overwhelming advantages of offensive forces over the defense and accelerated the dismantling of U.S. defensive forces. As the U.S. moved convincingly to implement offensively based deterrence theory -- assured destruction policy and constrained defensive policy -- it appreciated the influence that technology had on U.S. policy. Offensive and defensive weapons development in the 1960s pressed against the credibility of U.S. nuclear policies, namely massive retaliation. The ballistic missile revolutionized the nuclear threat and demanded that the U.S. respond to its increasing vulnerability to Soviet weapons. Additionally, defenses were increasingly less capable of keeping pace with the offensive threat. The U.S. decided to shift in favor of offensive deterrence, convinced that it was the only credible and secure policy from which U.S. national security could be enhanced.

The current defense debate is once again dependent on the technological developments of the offensive and defensive fields. The Reagan Administration has taken the initiative to push for a policy position prior to proven technological support. Should technology bring the offensive/defensive scales back into equilibrium or in favor of

defense, the revisions to U.S. nuclear deterrence policy -- declaratory policy, weapons procurement policy, nuclear employment policy, and arms control policy -- could be dramatic.

The ballistic missile defense debate that has emerged today has much in common with the earlier ABM debates. Yet, "the new arguments for BMD are critically and fundamentally different from the previous ABM debate at the same time as they are similar".[37] As in the 1960s, the issue of strategic defenses in the 1970s and 1980s has emerged while the U.S. government and the community of strategic nuclear analysts have become embroiled in a debate over U.S. deterrence policy. The advocacy of strategic defenses today is seen by many as a means to completely re-write U.S. deterrence theory and policy. An appreciation of these differences and the implications for U.S. strategic nuclear policy begins in Chapter 2, with an examination of the various defense models envisioned as products for the strategic defense initiative.

Endnotes Chapter 1

[1]"President Ronald Reagan's National Address on Defense," March 23, 1983; Presidential Documents (Washington, D.C.: U.S. Government Printing Office, 1983).

[2]Allan M. Din, "Strategic Defense Technology: Fact or Fiction?" International Defense Review, 19 (1985): 29.

[3]The U.S. began a wide range of research in the 1960s on ABM systems to include designs for space-based interceptors and ground-based laser weapons. A number of these original designs are now considered possible candidates for a U.S. BMD. However, they were judged immature during the 1960s and far too expensive to consider realistic alternatives.

[4]Herman Kahn, "Why we should go ahead with an ABM," Fortune, 79 (June 1969), 120.

[5]'Penaids' by definition refer to a penetration aid for offensive forces and are a subcategory of offensive countermeasures. Penaids have been traditionally associated with offensive enhancing hardware such as chaff and dummy warheads generally deployed during reentry. However, penaids can be used throughout the ballistic missile trajectory.

[6]Herman Kahn, "Why we should go ahead with an ABM," Fortune, 79 (June 1969), 120.

[7]Jerome B. Weisner, "The Argument Against ABM," Current, April 1969, 9.

[8]Desmond Ball, "U.S. Strategic Forces," International Security, 7 (Winter 1982/1983), 32.

[9]Ball, "U.S. Strategic Forces," 33.

[10]Werner R. Schilling, "U.S. Strategic Nuclear Concepts in the 1970s," International Security, 6 (Fall 1981), 53.

[11]Ibid.

[12]Ibid.

[13]Ibid, 54.

[14]Brennan, "The Argument for ABM," Current, April 1969, 12.

[15]Schilling, "U.S. Strategic Nuclear Concepts in the 1970s," International Security, 6 (Fall 1981), 59.

[16]Donald G. Brennan, Johnson Leon W., and George S. McGovern, Anti-Ballistic Missile: Yes or No?, Santa Barbara, The Center for the Study of Democratic Insitutions, 1969.

[17]These figures were arrived at essentially arbitrarily. However, they

owe much of their definition to the recognition of diminishing returns beyond these points to population and industry density patterns in the Soviet Union. Brennan Donald G., Johnson Leon W., and George S. McGovern, Anti-Ballistic Missile: Yes or No?, Santa Barbara, The Center for Study of Democratic Institutions, 1969.

[18]Brennan, "The Argument for ABM," Current, April 1969, 12.

[19]Ibid.

[20]Schilling, "U.S. Strategic Nuclear Concepts in the 1970s," International Security, 6 (Fall 1981), 64.

[21]Ibid, 60.

[22]Desmond Ball, Targeting for Strategic Deterrence, Adelphia Papers #185 (London, England: The International Institute for Strategic Studies, 1983), 19.

[23]See Peter Pringle and William Arkin, SIOP, (New York, NY: W.W. Norton & Co., 1983).

[24]Ball, "U.S. Strategic Forces," 34.

[25]Ibid, 37.

[26]Ibid.

[27]Ibid.

[28]Ibid.

[29]Ibid.

[30]Schilling, "U.S. Strategic Nuclear Concepts in the 1970s," International Security, 6 (Fall 1981), 61.

[31]Ibid. 62.

[32]Ibid.

[33]Ball, "U.S. Strategic Forces," 33.

[34]Schilling, "U.S. Strategic Nuclear Concepts in the 1970s," International Security, 6 (Fall 1981), 68.

[35]J. I. Coffey, "The Anti-Ballistic Missile Debate," Foreign Affairs, 45 (April 1967), 413.

[36]Michael Nacht, "ABM ABC's," Foreign Policy, 46 (Spring 1982), 158.

[37]Talk by Dr. Keith Payne on policy issues of BMD given at the Heritage Foundation, March 1, 1985.

CHAPTER TWO

BALLISTIC MISSILE DEFENSE: MODELS AND GOALS

The political, strategic, and technological hurdles to the deployment of the ABM in the 1960s eventually were resolved by the decision to deploy the Safeguard ABM system in conjunction with the signing of the ABM Treaty. This course was promoted as a result of the eagerness of the Johnson and Nixon Administrations to achieve some kind of arms control agreement with the Soviet Union that would moderate the Soviet offensive nuclear arms buildup and help prevent a destabilizing defensive arms race. Just as important was the assessment that ABM defense technology was not as effective as originally hoped. Finally, political pressure had mounted in the Senate to finalize U.S. ABM plans. The Nixon Administration choose to build a limited terminal defense of U.S. ICBM's even though the system had been originally designed as an area defense. The Nixon Administration had concluded as a result of the 'Packard Study' that the Johnson Administration's proposed Sentinal 'area' defense did not really serve U.S. security and that the appropriate objective was to defend U.S. missile fields.[1] The signing of the ABM Treaty, in turn, restricted the superpowers to 200 ABM missiles and eventually led the Ford Administration to dismantle the deployed Safeguard ABM system having concluded that it was cost ineffective in an offensive dominated strategic nuclear balance. These hurdles are illustrative of the wide differences that exist between the original debate over ABMs and the current flirtation with BMD. Although

there were a number of equally compelling reasons for signing the Treaty, it was recognized implicitly that the capabilities of the ABM would have limited value for U.S. security.

Having reviewed the central features of the strategic defense debate, it is important to describe the missions of the missile defense systems being considered. Unlike the ABM debate of the 1960s which focused on the capabilities and implications of 'traditional' anti-missile technologies, the current BMD debate centers around a number of radically new defense technologies and a proposed fundamental shift in U.S. deterrence doctrine and nuclear policy. National Security Decision Directive (NSDM 85) was issued subsequent to President Reagan's Strategic Defense speech and stipulated a long-term goal of seeking to eliminate the threat of ballistic missiles. "A second Directive (NSDM 6-83) ordered the Department of Defense to submit two reports by October 1983 - one to evaluate the strategic and policy implications of the defense proposal and the other to define a research and development program."[2] These reports -- from the Fletcher and Hoffman Commissions -- concluded that strategic ballistic missile defenses were feasible and both militarily and politically desirable.

The Strategic Defense Initiative Organization (SDIO) has been instructed to explore radically new defense technologies to determine how they can perform a range of defense missions: counterforce, countervailing, and countervalue defense. Yet, the SDI as a research effort addresses only the first half of the Reagan Administration proposals. Of potentially more lasting importance is the strategic objectives acclaimed for the potential technological products of the

SDI. President Reagan has called upon the scientific community to 'render nuclear missiles obsolete', however, the extent to which this objective is advisable much less achievable is yet to be decided.

The Fletcher Commission concluded that emerging technologies could make an effective BMD possible and that the key to such a system centered on a tiered defense. As such, a U.S. strategic defense could possess great leverage against Soviet ballistic missiles by attacking the missiles in each of three distinct phases of their flight: boost phase, mid-course, and reentry.[3] The BMD debate is likely to intensify once the SDIO determines, if possible, that a promising technology has been developed sufficiently to move to a deployable system and its strategic missions are defined. Not unlike the first ABM debate, the various defense models -- from counterforce defense to countervalue defense -- have generated their own set of political, strategic, and technological hurdles.

Currently, the political atmosphere appears more open to the idea that 'strategic defenses' are a viable option for the future of U.S. security. For example, the technological and political critiques of a 'countervalue defense', in the 1960s, more widely known as an 'area defense', were more focused than they are today. The ABM systems of the 1960s were dependent on fixed site deployment, carried nuclear warheads as a kill mechanism, and did not enjoy complete political advocacy from the Administrations in the White House at the time. Hence, the roles that an ABM could have played in U.S. strategic deterrence policy were limited by both technology and a lack of political support.

Proponents of ballistic missile defenses today not only envision a

number of different defensive systems, composed of a variety of BMD technologies, but also foresee these systems playing different yet highly integrated missions. A major impetus to ballistic missile defense is significant advances made in defense related technology, such as detection and tracking systems, command-control-communication, and non-nuclear kill mechanisms. A second stimulus is the political support for BMD from the Reagan Administration as well as the assessment, on the part of the Administration, that the strategic balance has been moving in favor of the Soviet Union. These combined factors appeared to have given BMD a solid military and political purpose in U.S. strategic nuclear policy as never before. The critical factor has been the Reagan Administrations' political support for an alteration of U.S. strategic deterrence policy in the direction of defense.

The original ABM debate in the 1960s revolved around a set of strategic and political conditions that no longer exist in the 1980s. The U.S. offensive nuclear arsenal was vastly superior to Soviet nuclear forces throughout this period in numbers of launch vehicles, missile throw weights, and their accuracy. This combination of capabilities generally was considered more than sufficient to deter Soviet aggression. Clearly, U.S. nuclear forces were capable of carrying out a retaliatory strike against Soviet military, political, and population targets in the event of a war. Both the Johnson and Nixon Administrations concluded, in turn, that a U.S. deployment of greater numbers of offensive nuclear weapons at that time was unnecessary to maintain a confident deterrent posture. Additional Minuteman ICBMs and Polaris SLBMs would not have increased U.S. deterrent capabilities

significantly. The U.S. already possessed an adequate number of strategic nuclear forces to attack nearly the entire set of Soviet targets. While the U.S. continues to hold a sizable number of strategic weapons today and actually has more ICBM and SLBM warheads than during the 1960s, the U.S. has lost its advantage in numbers relative to the Soviet Union.

A second concern of Secretary McNamara and President Johnson was the impact of a U.S. ABM on Soviet offensive forces. Both feared that a U.S. ABM deployment might create incentives for the Soviet Union to accelerate their efforts to achieve strategic equality with the United States. In anticipation of these possible outcomes, the Johnson Administration sought arms control talks with the Soviets.

Thirdly, technical drawbacks to an effective ABM defense in the 1960s -- large vulnerable radar installations and the potential ease with which the Safeguard system could be saturated or confused by dummy warheads -- firmly convinced most analysts that offensive nuclear weapons would retain their strategic leverage over defenses. The probability that an enemy's ballistic missile reentry vehicles could penetrate the Sentinel and Safeguard systems was considered high thereby lowering the overall value of these ABM systems for U.S. security.

Another factor that influenced the final ABM decision was the essentially invulnerability of U.S. nuclear forces to a Soviet surprise attack. While there were some concerns over the Soviet SS-9 ICBM as a possible counterforce threat to U.S. forces, the U.S. was reasonably confident that its strategic nuclear arsenal could execute a crushing retaliatory blow after any initial Soviet attack.

These factors were critical in the 1960s debate of whether or not to go forward on the ABM. The interaction between offensive and defensive forces was considered crucial to maintaining a stable nuclear balance. A stable balance for the U.S. entailed restraint on the growth of Soviet nuclear forces as well as their international ambitions. Equally compelling for U.S. policy makers was the threat of a vigorous nuclear arms race in both the offensive and defensive arenas. Concern that defense deployments might ignite such a race led a number of arms control advocates to suggest that a treaty restricting defenses might preclude an offensive arms race and thereby enhance strategic stability. That is, the U.S. sought to bind the Soviets to the concept of a stable balance of offensive nuclear power in which mutually vulnerable populations would temper the need to expand offensive forces.

Offensive nuclear forces, as suggested by the concept, could be lowered to a level where each superpower still retained an assured destruction capability. The ABM Treaty specified that each nation agreed not to deploy ABMs above the prescribed number while seeking offensive arms control negotiations. This would preclude the need, it was thought, to continue an arms race. The linkage postulated by arms control advocates figured strongly in the Senate ratification debates over the ABM Treaty. A principle argument was that the Soviet offensive deployment might be restrained by restraining defense deployments, namely ABMs.

The prospects of an active defensive component to U.S. strategic nuclear policy greatly diminished upon ratification of the ABM Treaty. A decade and a half of research and testing various defense concepts and

systems -- from civil defense to ABMs -- ended with a stronger conviction in maintaining an offensive deterrent posture. Today, defense is seen by its advocates as a means to degrade a much more capable Soviet force that emerged from their 1960s and 1970s buildup and thereby strengthen deterrence.

I. The Strategic Nuclear Balance: the 1980s

The strategic nuclear balance has undergone a number of significant changes since the late 1960s and early 1970s. Clearly, the conditions described above no longer prevail. Both nations have continued either to deploy new and more deadly offensive nuclear forces or upgrade their existing forces in a similar manner. Both superpowers have attempted to exploit their relative strategic advantages. The U.S. has maintained its advantage in missile accuracy, although recent reports suggest that the Soviets have matched U.S. missile accuracy with their new generation of mobile ICBMs (SS-25 and SS-X-24). The Soviets, for their part, have continued to exploit their advantage in missile throw weight and as a result, the number of warheads on their land-based strategic forces. In addition, the Soviets continue to maintain a greater number of ICBMs and appear to emphasize war-fighting capabilities. The average yield of Soviet warheads, while falling, stands at 600 kilotons and is four times the average 150 kilotons of U.S. warheads.[4]

The relative positions of the superpowers within the strategic balance has shifted since the signing of the ABM Treaty. The U.S. no longer holds an overwhelming lead in most categories of weapons. The

Soviet Union has deployed hundreds of new ICBMs and SLBMs and thousands of new nuclear warheads during the past decade and a half. For example, the Soviet Union deployed five new classes of ICBMs and introduced seven major modifications to these systems since 1970; they include the SS-18, SS-17, SS-19, SS-25, and SS-16 (an experimental system potentially with some operational capability).[5] The Soviets also have deployed seventy new strategic submarines and four new types of submarine launched ballistic missiles since the late 1960s. The Soviets are continuing to expand their land-based strategic forces with the development of new bombers equipped with long range cruise missiles. Finally, this buildup is continuing with the development of two new ICBMs, two SLBMs as well as air, ground, and sea-based cruise missiles.[6]

The U.S., for its part, while it has deployed a new fleet of SLBMs (the Poseidon and Trident), has deployed no ICBMs, and has actually reduced the total number of warheads in its strategic arsenal by reducing the total number of strategic bombers carrying gravity bombs. However, the U.S. has upgraded the Minuteman III warhead accuracy and its nuclear yield. In addition, the U.S. has deployed air-launched cruise missiles on its fleet of strategic bombers and has a number of strategic weapons either ready for deployment or under development.[7] Table 2. displays the rough number of reentry vehicles deployed on U.S. and Soviet ballistic missiles. While the Soviet Union has deployed a few more reentry vehicles than the U.S. since 1970, the total number of deliverable warheads available to the U.S. is actually greater as the U.S. bomber force is larger and capable of carrying more weapons.

Table 2. Deployed Reentry Vehicles: 1970-1985

ICBMs:	1970	1975	1980	1985
U.S.	1200	2100	2100	2050
U.S.S.R.	1100	1900	5200	6300
SLBMs:				
U.S.	1000	3000	5100	5700
U.S.S.R.	200	850	2100	2600

Source: Soviet Military Power 1985, U.S. Government Printing Office: Washington D.C., 1985, pp. 30 & 33.

The threat posed by new Soviet weapons to the credibility of the U.S. deterrent combined with ever more sophisticated command and control elements for mounting offensive attacks has made strategic defenses an appealing option to the Reagan Administration. Although the popular description of a 'rough equivalency' for the nuclear balance has been used since the mid 1970s and neither superpower has developed the capacity to truly threaten a dis-arming strike, many U.S. analysts fear that the Soviet Union actively is seeking this capability in an effort to shift the strategic balance permanently in its favor.

A de-capitating first strike is theoretically possible. However,

few strategic analysts believe that either side will achieve this capability in the near future. Many experts do point to the apparent Soviet effort to procure a force capable of destroying the bulk of the U.S. ICBM force in a single attack which would leave the Soviets with a more capable and larger force in reserve. Whether larger nuclear reserve forces translate into military or political advantages is questionable but would be dependent on the relative sizes of remaining forces, their types, and the attackers' confidence that they had done adequate damage to realize an advantage. This kind of attack could leave the U.S. with the choice between launching a large scale retaliation with its remaining ICBMs, SLBMs, and strategic bomber force or doing very little in terms of a war-fighting option. The crux of this argument is that U.S. forces remaining after a Soviet first strike, namely SLBMs and bombers, currently are less capable of destroying hardened Soviet military sites than ICBMs.

In light of these trends, the Reagan Administration has decided to explore the possibility of using strategic defenses to redress some of the threats posed to the U.S. by Soviet nuclear forces. A second more general objective is to transcend current conditions by which deterrence is maintained, namely an offensive balance of nuclear force between the superpowers. Three major concerns have convinced a number of strategists that missile defenses are worth seeking. One of the more highly debated issues has been the argument that the Soviet Union is acquiring advantages over U.S. nuclear capabilities which threaten to destabilize the strategic balance. A second factor has been a general review of U.S. deterrence theory and nuclear strategy since President

Reagan's election in 1980. This review partially was instigated by Presidential Directive 59 which the Reagan Administration initially charged was not a radical enough departure with past U.S. strategic policy.

A final factor has been the perceived failure of the arms control process. While the ABM Treaty remains in force, the superpowers have not achieved significant reductions in offensive nuclear forces as expected after the signing of the ABM Treaty. Both superpowers have continued to produce offensive forces almost unabatedly. From the Reagan Administration's perspective, the SALT agreements have restrained the Soviet nuclear buildup only in the most limited fashion. For example, the Soviets generally have not deployed delivery vehicles, ie. ICBMs, beyond the numbers they possessed at the signing of the SALT I accords when they might have in the absence of the agreements. "For years the right had feared a 'window of strategic vulnerability'. More recently, the left had come to fear a general breakdown of the nuclear peace. In broaching his idea of a strategic defense initiative, President Reagan was responding to a pervasive discontent with the viability of the theory of mutual deterrence."[8] However, "a crisis of arms control, a perceived erosion of deterrence, and the march of technology: this is how we got where we are today with" the SDI.[9]

II. Deterrence

Given the march of time and the changes in the strategic nuclear balance over the past decade, what are the implications for deterrence of pursuing a ballistic missile defense? There are two key features

which characterize deterrence. Deterrence, on the one hand, is composed of perceptions about the usefulness of nuclear weapons to gain political and military objectives. When doubt exists as to the success of their use, a nation is likely to be deterred from using nuclear weapons. That doubt is a result of a number of uncertainties about the level of success which an attack can achieve as well as the impact from a retaliation. For example, the Soviet Union and the U.S. can not be sure that they could execute a limited nuclear strike against specific military targets with complete success. Missiles may fail at any stage in their flight, reentry vehicles may not detonate their warheads properly, and the missiles may not achieve accuracies sufficient to destroy their targets. Clearly, it is in the U.S.'s interest to take steps which create uncertainty in Soviet calculations for an attack on the United States.

The issue of uncertainty surrounding Soviet attack calculations has centered on the problem of U.S. ICBM vulnerability since the mid 1970s. A vulnerable ICBM force may reduce the level of uncertainty in Soviet attack plans thereby potentially lessening the ability of the U.S. to deter the Soviets in a crisis. The U.S. has debated a number of means to enhance the survivability of its ICBM forces. The mobile MX ICBM in various 'race track' schemes has been proposed. However, as the MX remains controversial, the U.S. has considered other measures such as moving a larger percentage of its strategic forces to sea aboard submarines and placing ICBMs on strategic bombers or Boeing 747 aircraft. While these various schemes continue to be debated, the U.S. has hardened its ICBM launch silos and increased the force's capability

to launch on warning of a Soviet attack or from under attack.

The credibility of deterrence, on the other hand, depends on the capabilities of an enemy's nuclear arsenal. That is, credibility "pertains to the expected costs of challenging the status quo of the strategic balance by launching a nuclear attack. Deterrence works when the expected outcome costs of such a challange are greater than those of accepting the current balance."[10] These costs generally have been equated with a determination of the capabilities of a superpower's nuclear forces to cause 'unacceptable damage' in response to an initial attack.

The level of damage required to satisfy an 'unacceptable damage' measure was first considered by Secretary McNamara. As alluded to in Chapter One, he established the levels of damage at sixty five percent of Soviet industrial capacity and roughly thirty percent of the Soviet population. Today this would represent roughly seventy-five million Soviet dead and, for comparison, would equate to about one third of the U.S. industrial capacity destroyed. In recent years, U.S. targeting requirements have shifted in favor of a less massive level of destruction. However, "deterrence may fail if the threat to bring about these costs is not credible or is directed in the wrong way or at the wrong values".[11]

Further, the credibility of a U.S. retaliation may weaken if the Soviets are led to believe that the U.S. will not or can not retaliate. The U.S. maintains that it would retaliate against a Soviet nuclear attack and clearly it possesses the nuclear forces capable of launching a retaliation. A single U.S. Trident SSBN could launch attacks on 192

Soviet cities. However, the Soviets may seek to weaken the U.S. deterrent by preparing damage limitation measures such as strategic defenses and counterforce weapon systems. Whereas the U.S. had some dedicated defenses, namely air and civil defenses in the 1950s and 1960s and an ABM defense in the early 1970s, the Soviets have always been more serious about defense. Currently, the Soviets maintain nearly 1,200 fighter interceptor aircraft and 10,000 surface-to-air launchers dedicated to protect the Soviet air space.[12] The Soviets also maintain a ring of ABMs around Moscow which are being upgraded to 100 launchers permitted by the ABM Treaty. Soviet strategic offensive forces today possess a considerable counterforce capability. The deployment of new mobile ICBMs, the SS-25 and SS-X-24, may add to the Soviet's overall damage limitation capabilities.

In order to prevent a significant loss of credibility, the U.S. might strengthen or augment its offensive nuclear forces with new offensive weapons such as mobile ICBMs and advanced stealth cruise missiles or by deploying strategic defenses such as a ballistic missile defense.

These conditions traditionally have been grounded in the tenets of Mutual Assured Destruction theory. Although the policy for assured destruction as well as other policy dimensions of the U.S. strategic nuclear policy mix will be discussed in Chapter 3, a general overview of the policy will provide a basis for discussing individual BMD models. Mutual Assured Destruction depends on the perceptions and their backing nuclear forces to maintain a balance of terror. Although MAD and "deterrence appear to present a paradox - preserve peace through a

balance of terror - one which also appears intolerable, it has no alternative".[13] The critical problem with MAD and hence deterrence in general, is that while the terror is certain, so long as nations possess nuclear weapons, "the balance is apt to disappear depending on the efforts of the contestants."[14] One of the greatest threats to deterrence is an unstable balance between the two superpowers. The incremental changes that have been made to each side's nuclear forces in the last fifteen years - increased missile accuracy and deployment of multiple warheads - have profoundly influenced the stability of the strategic balance. These changes may lead to a lessening of the U.S.'s faith in its nuclear force to carry out its missions. A second impact might be a change in the Soviet's perceptions of the U.S. nuclear posture's credibility.

The central question is: What will continue to pass today and into the future as acceptable deterrence? A question raised by Edward Teller, an advocate of a strategic defense, is: "Can the U.S. maintain an effective deterrence without a true defense as well as a retaliatory policy? Will the U.S. need both in the emerging strategic environment?"[15]

The preceeding comments illustrate the breadth of issues in the current debate over strategic defenses and highlight the ongoing debate over U.S. strategic deterrence policy. Chapter 3 will examine more closely the impact defenses may have on U.S. strategic nuclear policy. However, it is relevant to the discussion of defense missions to address the policy context in which BMD has been proposed. For example, the U.S. policy community "is certain to be debating the roles for BMD while

also debating the value of MAD in a changing strategic environment".[16] Walter McDougall has questioned the manner in which a condition of mutual assured destruction is maintained and whether its maintenance is in the interest of U.S. security if the Soviets continue to build "beyond the levels at which a rational policy in support of mutual assured destruction suggests they build".[17] Strategic defense proponents charge that the Soviet Union has built not only beyond its needs but that their efforts threaten the stability of deterrence within the current balance thereby making a nuclear war more likely.

The stability of the strategic nuclear balance is crucial to the maintenance of deterrence. In a destabilized balance, deterrence is less likely to prevent the outbreak of a nuclear war as both superpowers might perceive the nuclear threat to have been heightened and possibly launch to prevent being caught off guard.

What conditions make the nuclear balance less stable? Both advocates and critics of BMD agree that a stable balance is a more secure balance and any measures which threaten its stability is dangerous. It is the means for re-dressing the destabilizing conditions, in part, which separates the two parties in the debate. One of the central points made by BMD advocates, particularly advocates of a limited counterforce defense, is that the Soviets have attempted to develop an extremely threatening counterforce capability. The pertinent question is: "are the Soviets less deterred because they possess or may possess a counterforce capability in a crisis?".[18]

The Reagan Administration, in calling for a strategic defense for the U.S., "rejects the idea of continued sole dependence on the threat

of retaliation to deter the Soviets and the idea that the nuclear balance will remain stable because deterrence, as currently composed, has worked for 35 years."[19] The re-emergence of defense stems from a broader shift in U.S. strategic thought that has begun to question the value of assured destruction policy. A number of policy makers in the government have come to believe more firmly "that nuclear war is possible, that the Soviets appear to be preparing for a nuclear war, and hence the U.S. must prepare to deter it and fight it should it occur".[20] This transition to a more defined war-fighting policy and posture has been made possible by technological improvements in such areas as missile accuracy and command-control-communication battle management elements. These components, policy and weapons hardware, combine to produce a basic shift in favor of a countervailing/war-fighting policy for U.S. nuclear forces.

Although it appears to have been a logical progression in U.S. policy to go from assured destruction to a countervailing/war-fighting policy to maintain a stable deterrence, there also appears to be a new deterrence in the emerging strategic environment. Some analysts have argued that the logic of nuclear weapons developments -- C3 and defense improvements -- is toward a nuclear war-fighting policy in order to ensure deterrence against U.S. enemies, but it is in the nature of these capabilities to threaten deterrence further.

A relevant question is: Can the U.S. enhance its security and how can it reduce the threat of an attack or the potential damage that would result from a Soviet attack? A logical step would be to seek reductions in the numbers and capabilities of nuclear forces of the

superpowers. Short of this, deterrence may be enhanced through the arms control process and possibly by the deployment of weapons systems believed capable of enhancing deterrence. Advocates of defense charge that arms control has failed, that unilateral disarmament is dangerous and foolish, and that strategic defenses offer a more secure path for preserving U.S. security and maintaining a stable balance than continuing along the current offensive deterrence path. More importantly argue the same advocates, it may be more rational in an increasingly destabilized strategic world to defend the nation rather than retaliate and remain vulnerable to a devastating attack.

McDougall states that the defensive response to the decline of MAD -- due to the changing strategic environment -- is that it may provide a lower risk of war than in a MAD world. Secondly, BMDs do not necessarily conflict with arms reductions as the end to the balance of terror is the primary goal of each. Thirdly, according to some defense advocates, there may be better control of strategic arms in a BMD world as new avenues for arms control emerge. Lastly, BMD can augment a credible deterrent because a stable balance derives from the certain failure of a first strike rather than the certain success of retaliation which would be precluded by a successful first strike.[21]

Assuming that some form of BMD will be deployed by the U.S. or the Soviet Union within the next few decades, it is important to review the alternative models proposed by advocates of BMD. Clearly, "one's position on BMD depends on the goals and purposes linked to the system. And secondly, the proper question in this context is can the system work to achieve a specified strategic goal? What is the criteria for a BMD

system?"[22]

The basic strategic and political tension in the current defense debate falls between the advocacy for protection of populations and the protection of nuclear forces. Although it would appear to make political as well as moral sense to attempt to protect the nation's population, it is a peculiar facet of the mutual assured destruction theory which has dominated U.S. deterrence policy that protection of populations is a destabilizing effort. In addition, it is an enormous technical problem for the defender.

III. Ballistic Missile Defense Missions and Problems

A. Counterforce Defense

The focus of the first and often least contentious mission for a U.S. ballistic missile defense is 'Counterforce Defense'. The key objective of this mission is defense against a counterforce attack on U.S. strategic nuclear forces. For example, a counterforce defense might be deployed to redress the so-called 'window of vulnerability', that period in which U.S. strategic nuclear forces will be vulnerable to a Soviet first strike as charged by holders of this concept.

The counterforce defense traditionally has been associated with the defense of ICBM silos and/or their launch control sites. Theoretically, a perfectly executed counterforce attack by the Soviet Union on U.S. ICBMs could destroy a large portion of the force. In the event of such an attack, the U.S. could retaliate with less accurate countervalue

weapons. A U.S. retaliation of this kind, follows the line of reasoning held by 'window of vulnerability' advocates, would invite a similar countervalue strike on the U.S. leaving it more heavily damaged than prior to its retaliation. The Scrowcroft Commission, established by the Reagan Administration to review the various strategic programs designed to modernize the U.S. nuclear arsenal, concluded that the 'window of vulnerability' did not in fact exist. The Commission reported that the Soviets were unlikely to risk a counterforce strike on U.S. ICBMs so long as the U.S. possessed weapons that it could retaliate with, namely SLBMs and strategic bombers. Additionally, the Commission concluded that the U.S.'s assured destruction capability could not be radically degraded in the near term by a Soviet strike.

A counterforce defense also could provide protection for U.S. Strategic Air Command bomber bases, Strategic Ballistic Missile Submarine bases, and U.S. command-control-communication assets.[23] In essense, a counterforce defense would be deployed to preserve the ability of the U.S. to respond to a Soviet nuclear attack, in a fashion that is similar to that envisioned by the deployed Safeguard ABM. A counterforce ballistic missile defense today also might incorporate defensive weapons very similar to the Safeguard ABM. A defense of this kind could include exoatmospheric and endoatmospheric interceptors.[24] These defenses would be deployed to defend specific sites or targets. A number of Department of Defense programs have been exploring modern versions of a Sprint-type interceptor to perform endoatmospheric defense. For example, hypersonic missiles, using on-board millimeterwave radar seekers to home in on targets for a direct kinetic

energy kill, have been developed. These weapons are designed to engage reentry vehicles at an altitude of 10 to 15 kilometers. In addition, D.O.D. has explored a number of new weapons technologies for a counterforce defense. These weapons could include lasers fired from high ground surrounding specific targets being defended as well as 'shotgun' type systems employing small projectiles such as the Swarmjet proposal.[25]

While the counterforce defense is somewhat better understood from a technical perspective than other defense missions due to past ABM programs, it is not without its own problems. The basic interceptor defense has not progressed much beyond the Safeguard ABM program. Current interceptors possess greater accuracy as demonstrated by the Homing Overlay Experiment and thereby the requirements for nuclear warheads as the operative kill mechanism has diminished. Conventional warheads and direct intercept is now more feasible. However, the number of interceptors required to execute effective counterforce defense may reach into the thousands as the problem of offensive profusion remains during the terminal phase. While ballistic missile tracking and target prediction technology has improved and some of these components may be made mobile thereby reducing their vulnerability, effective battle management remains a difficult problem. For example, target prediction is based on the trajectory of the ballistic missile, when in fact an effective endoatmospheric defense requires knowledge of warhead trajectories during the terminal phase. Therefore, manueverable or eluding reentry vehicles can create tremendous problems for the defense.

Allan Din characterizes these problems as one of battle management.

He described battle management to include "the monitoring, assigning and firing of weapons, assessment of results and possible refiring, all of which have become much more complex. Sensor technology may now offer methods of discrimination between targets and decoys, but given the short time available to solve a large number of problems, as well as the inherent limitations of interceptor velocity, the efficiency of a traditional terminal defense can not be expected to be sufficient".[26] Another problem for a counterforce defense is the possible deployment of penaids on Soviet ballistic missiles. The deployment of metal chaff prior to reentry currently can confuse tracking radars and thereby mask targets being attacked and shorten the defenders response time.

A counterforce threat exists if both counterforce weapons are possessed by one party and a second party has a vulnerable target. Much of the debate surrounding U.S. deterrence policy and its nuclear forces in the 1970s concerned the issue of a counterforce threat to U.S. ICBMs. United States intelligence analysts concluded in the mid 1970s that Soviet ICBMs were approaching levels of accuracy sufficient to put a large portion of the U.S. ICBM force at risk. At the same time, the U.S. began debating how it might modernize its Minuteman ICBM force or replace it with the MX ICBM in order to reduce the force's vulnerability. Secondly, a counterforce threat is credible only if a sufficient number of counterforce weapons exist which can place in jeopardy a considerable number of the enemy's forces such that an attack on them would nullify the deterrent and military value of those forces.

An understanding of the counterforce defense and its associated technology requires a review of the target set to be defended. The

counterforce defense mission generally has been associated with the defense of U.S. land-based ICBMs by defeating an attack on their launch silos or on associated command bunkers. The ICBM is the most reliable, time-urgent, flexible, and effective leg in the U.S. TRIAD. However, the ICBM also is probably the most vulnerable strategic system in the U.S. arsenal. The combination of its characteristics make the U.S. ICBM a high value target. "High alert rates and supporting communication systems make ICBMs the most responsive element of the TRIAD."[27] Reliability is defined as the operational ability to launch the weapon in the event of war, whereas time-urgency, flexibility, and effectiveness relate to the variety of attack missions the ICBM is capable of performing. An ICBM can be used to carry very large nuclear weapons in a traditionally assured destruction mode or to carry relatively small and highly accurate warheads designed for selective counterforce strikes. The U.S. Minuteman III ICBM, for instance, is capable of direct, real-time attacks on Soviet nuclear forces. While the ICBM has been rated the most effective deterrent in the U.S. arsenal, its present mode of deployment makes it vulnerable and as a result reduces its overall deterrent credibility.

The Carter Administration attempted to address the problem of the Minuteman's vulnerability by promoting deployment of a mobile MX ICBM. Mobile basing, race track deceptive basing, and other measures to enhance survivability, including silo hardening, were criticized by advocates of counterforce defenses as insufficient. They charge that an active defense is required to maintain the credibility of the U.S. nuclear force in the face of growing numbers of Soviet counterforce

weapons. In that the ICBM is considered so essential to the U.S. deterrent, the rate at which the Soviet Union has deployed counterforce weapons is alarming to proponents of the need for an effective ICBM force and counterforce defense. The vulnerability of U.S. ICBMs is documented by Albert Carnesal and Charles Glaser. Carnesal and Glaser estimate that the Soviet's current force of 308 SS-18 can destroy better than 80% of the Minuteman force if needed.[28]

A number of U.S. strategic air command and strategic nuclear submarine bases are vulnerable to Soviet submarines patrolling off U.S. coasts. United States strategic nuclear submarines might require hours to disperse from their bases while only some SAC bombers are on alert aprons and capable of escaping while a surprise nuclear attack is in progress. A Soviet strike using SLBMs and cruise missiles could place weapons on U.S. coastal bases within minutes of launch. A Soviet counterforce attack of this nature could destroy a sizable portion of U.S. forces on base. However, the U.S. generally keeps 50 percent of its strategic submarines at sea effectively precluding the complete destruction of these forces. In addition, a number of SAC bases are well inland of U.S. coasts thereby providing additional warning time for bombers to escape.

The primary objective of a U.S. counterforce defense would be to assure the survival of an effective portion of U.S. strategic nuclear forces. While a counterforce defense might be deployed to protect bomber and submarine bases, a defense of these assets is considerably more demanding than a defense of ICBMs. The critical factor in this regard is the amount of warning time till impact of Soviet warheads. As

alluded to above, the Soviets could attack some bomber and submarine bases more quickly than U.S. ICBMs. A second consideration is the softness of these bases. While a Soviet SLBM or cruise missile might do considerable damage against a submarine or SAC base, they could not destroy U.S. ICBM silos with a high degree of confidence.

Given these constraints, a U.S. counterforce defense is more likely to be deployed around U.S. ICBM fields. The portion of ICBMs which the U.S. might desire to defend is equal to a level at which the force can continue to serve as a useful deterrent as well as carry out wartime missions. Some U.S. ICBMs, such as the Minuteman III, are charged with prosecuting limited strikes against Soviet ICBMs and other major Soviet military targets such as command bunkers and critical command-control-communication nodes. The U.S. might want to preferentially defend these hard target kill forces in order to maintain their unique capability to destroy Soviet hardened military targets. In sum, a counterforce defense must be sufficient to "require the attacker to expend more weapons in hopes of achieving the destruction of a target."[29] This raises the notion of an attack price.

An attack price is the cost in nuclear weapons expended to destroy a target. In this case, the target most likely to be a hardened and defended is an ICBM silo. When a silo is not defended by either passive or active ballistic missile defenses, the attacker need only launch the fewest number of weapons -- usually two deliverable weapons for each target -- needed to destroy the silo assuming some margin of error. The Soviet Union may perceive that it has a straightforward calculation to determine the necessary number of counterforce weapons to target the

bulk of the U.S. land-based strategic deterrent.[30]

Some rough calculations can display the significance that a counterforce defense may have for the survival of U.S. nuclear forces: a Soviet attack on U.S. Minuteman forces currently would require 200 ICBMs based on a two warhead per silo attack given that Soviet SS-18 ICBMs carry ten warheads per missile. The Soviets presently have some 308 SS-18 Mod 4 ICBMs each capable of carrying up to 14 warheads but restricted to 10 warheads by the SALT II agreements. The Department of Defense has assessed the SS-18 Mod 4 to have been designed specifically to attack and destroy ICBMs and other hardened targets in the U.S. While D.O.D. has recently downgraded its assessment of the Soviet SS-19 ICBM for hard target kill capability, it has concluded that the SS-18 Mod 4 force has the capability to destroy between 65 and 80 percent of U.S. ICBM silos using two nuclear warheads against each.[31] The deployment of a counterforce defense around U.S. Minuteman silos with the capability to destroy 50 percent of incoming warheads would require the Soviets to double the number of ICBMs launched to 400 in this attack to achieve similar results. However, if D.O.D.'s current assessment of the SS-19 is accurate, the Soviets would be unable to prosecute a counterforce attack on U.S. Minuteman ICBMs where the U.S. had deployed this kind of defense.

Although hypothetical, this scenario illustrates the capability of a counterforce defense for degrading a Soviet strike. A Soviet general would have to take into account similar calculations before deciding whether such an attack could achieve military objectives adequate to ending a war in a favorable position relative to the United States.

The second more general objective of a counterforce defense is the maintenance of a stable strategic nuclear balance. The nuclear balance is composed of a balance of forces between the U.S. and Soviet Union. That is, both superpowers possess roughly matched nuclear forces and as such, the balance is considered stable so long as neither superpower acquires forces that can shift the nuclear scale in its favor. Both nations strive to offset the deployments of the other superpower with deployments of its own and through the negotiation of arms control measures designed to maintain the balance within certain definable boundaries. A counterforce defense can contribute to this objective by providing the U.S. another means of balancing its forces against those of the Soviet Union. In this fashion, a counterforce defense would contribute to the U.S. deterrent by assuring that the U.S. would have adequate forces surviving to deter future Soviet attacks even after a Soviet attack that left the U.S. heavily damaged.

B. Countervailing Defense

A second goal is "Countervailing Defense" in which ballistic missile defense would be employed to protect strategic assets including U.S. nuclear forces as well as other military targets (OMTs). These targets include the U.S. command-control-communication network which is critical to the U.S. deterrent posture and its war-fighting capabilities. The command-control-communication network is comprised of systems designed to warn the U.S. of a nuclear attack, to provide prediction of an attack size and probable target points, and to relay

information to U.S. nuclear force command sites to retaliate. These systems range from launch detection satellites (LDS) and the Ballistic Missile Early Warning Radar line (BMEW) to the North American Air Defense Command (NORAD) and National Command Aircraft in which the President might command U.S. wartime operations.

The objective of a countervailing defense is to deter an enemy from attacking those U.S. military and political assets that the U.S. deems necessary to prosecuting a war. The principal objective of this mission, like that of counterforce defense, is to deter a nuclear attack on the United States. Yet, it differs from counterforce defense in that it claims that nuclear weapons have a broader deterrent role than envisioned in a minimum deterrence policy which relies on the maintenance of a retaliatory force and assured destruction policy. Proponents of countervailing defense tend to favor the protection of military targets against a wider range of attacks. That is, increasing the survivability of these military targets is seen as a means of reducing an adversary's ability to achieve his objectives, thereby strengthening deterrence.[32]

A primary concern of countervailing defense proponents is that minimum deterrence is not adequate to deter the range of possible nuclear wars. For the countervailing school of thought, "the principal method of deterrence is to foster within the Soviet leadership serious uncertainties regarding their ability to achieve, by the use or threat of force, any political or military objective that jeopardizes important U.S. interests."[33] In this context, the U.S. must be capable of inflicting substantial damage on Soviet military forces and strategic

assets and the U.S. must be capable also of defending its own military and strategic assets in order to deter a Soviet attack on them.

Carter further described the countervailing strategy as requiring that "U.S. offensive forces be sufficiently survivable to ensure a deliberate retaliatory strike against a wide array of preplanned targets, many of which will be hardened military facilities."[34] As a result, "the countervailing defense approach places great importance on the survival of U.S. command-control-communications and intelligence capabilities. It is important to be confident of an ability to execute a deliberate and selective response to a nuclear attack in order to foster a Soviet perception that the deterrent could be employed."[35] Toward that end, U.S. C3I facilities -- of which there are roughly 100 critical fixed sites -- and ICBM forces must have some endurance. The major role of ballistic missile defenses in this context is two-fold. First, ballistic missile defenses could be used to protect critical C3I facilities and ICBMs in order to preserve the deterrent value and war-fighting capabilities of these assets. That is, a ballistic missile defense could help ensure the survivability of these assets which are critical in a countervailing strategy for creating uncertainty in the minds of Soviet leaders about the potential success of a nuclear attack on the United States. However, the countervailing strategy is dominated by offensive forces; defenses would be deployed . . . primarily to strengthen the survivability of the deterrent force and its related C3I facilities.[36]

Secondly, a countervailing defense might be central to the denial of Soviet war aims should war break out. This objective is closely

associated with a war-fighting strategy. "These strategies presuppose that nuclear war could occur; therefore, plans must be made for the most effective military use of nuclear weapons, for defending against them, and for terminating conflict on favorable terms."[37] "The deterrent mechanism of these strategies is a credible capacity to deny an enemy the attainment of his political or military objectives in war."[38] Although a war-fighting strategy would assimilate a countervailing defense, it also might call for defenses to protect some population centers and other key economic infrastructure. In addition, a true war-fighting strategy might entail a wide array of passive defense measures such as hardening missile silos and C3 bunkers, dispersing SAC bombers, and procuring redundancies in all major strategic C3 systems.

A countervailing defense used to enhance a war-fighting strategy for the U.S. extends the countervailing strategic policy pronounced by Presidential Directive 59 during the Carter Administration to its broadest interpretation. That is, whereas a countervailing policy seeks to enhance the deterrence credibility of U.S. nuclear forces first, it also recognizes the need to support dedicated limited nuclear options in the form of counterforce capable weapons. Countervailing defense advocates, such as Colin Gray, seek to integrate defenses with the countervailing policy in order to "permit the U.S. to emerge from a nuclear conflict in a relatively favorable power position."[39] Defenses, in this context, might assume a particularly important role in defeating a Soviet nuclear attack against U.S. military and strategic assets considered critical to prosecuting a war.

A countervailing defense could be expected to exploit similar BMD

systems as the counterforce defenses previously discussed. For example, many C3I facilities might be defended in a similar fashion as U.S. ICBM silos. Both endoatmospheric and exoatmospheric defense systems could be expected to be employed. Another potential contender for countervailing defense missions would include mid-course defenses which extend to the exoatmosphere and often are mentioned by SDI scientists along with more exotic weapons such as the electromagnetic railgun.

The Defense Advanced Research Projects Administration (DARPA) and U.S. Air Force have been developing the 'railgun' as a possible mid-course defense. The system can accelerate projectiles weighing only a few grams to tremendous speeds, ie. ten kilometers per second.[40] At these speeds the kinetic energy created on impact with ballistic missiles or reentry vehicles would either destroy them or sufficiently deflect them from their course to cause them to burn up on reentry into the atmosphere or miss their targets. A railgun might work in conjunction with a target designator such as a low powered laser. However, the power generation and pointing technology remain major stumbling blocks to an effective railgun.

Although a countervailing defense might use many of the same systems as a counterforce defense, its objectives would be more demanding. That is, the defense would be expected to achieve higher kill levels (lower penetration levels) against incoming ballistic missiles in order to preserve the U.S. capability to continue fighting a war.

Mid-course defenses, while they may have the longest time span to destroy attacking ballistic missiles, also might have tremendous

difficulty in distinguishing the more threatening missiles and determining which are decoys. Difficulty arises because the ballistic missile booster burns out prior to mid-course and its infrared signature weakens. In addition, the post-boost vehicles begin to maneuver and dispense warheads and penaids during the twenty minute mid-course. Hence, very sensitive and sophisticated surveillance systems will be required to perform the distinguishing and tracking tasks. The overall vulnerability of these systems to interference, both active and passive, might effectively preclude their achieving high levels of kill.

C. Countervalue Defense

A final model is "Countervalue Defense" in which the U.S. might seek to shift the basis of deterrence from reliance on offensive nuclear forces for retaliating against a nuclear attack to defensive forces designed to assure the failure of any nuclear attack. This model rests on the hope that strategic defenses to include ballistic missile defenses can dominate the offense. The countervalue defense is most closely associated with the romanticized "Star Wars" defense portrayed by the media. A countervalue defense is effectively the goal that President Reagan called for in his defense speech of March, 1983. While a countervalue defense has intense political and military appeal, it is clearly the most difficult defense to achieve.

The countervalue defense focuses on 'area-wide' defenses and the idea of national survivability. The basic ballistic missile defense system envisioned for this model might be a multi-tiered space-based

defense. A first layer might consist of boost-phase defenses and is likely to incorporate a number of directed energy weapons (DEW) such as lasers, microwave weapons, or particle beams. These defenses are so-called because of their potential ability to destroy a ballistic missile during its initial three-to-five minute boost phase into space. During the boost phase, ballistic missiles are vulnerable, having large infrared signatures from their engines which provide excellent tracking and targeting data. However, the attacker can seek to reduce this 'signature' by using fast burn booster rockets or by shielding or masking the booster flame.

Directed energy weapons such as a laser, if controlled properly, can exert deadly energy on objects at great distances. Depending on the laser wave length, such a defense can kill a ballistic missile by burning through its outer skin or, in the case of an excimer laser, by an 'impulse' kill.[41] Equally compelling is the ability of a laser or particle beam to reach its target in fractions of a second thereby rendering the speed of a ballistic missile, roughly 15,000 miles per hour, insignificant.

However, some of the most promising DEW systems have serious technological hurdles to overcome. The chemical laser which has been the focus of U.S. DEW research since the early 1970s has difficulty attaining adequate power output levels, thereby requiring longer 'dwell' time on a ballistic missile in order to achieve a kill. Also, the size of a space-based laser station at present would preclude an effective system as tons of fuel would be required to produce adequate power levels. Sydney Drell estimated a space-based defense system might

require 250 laser battle stations and that fueling these stations alone would require 250 space shuttle trips.

An additional advantage of the boost phase defense is that it might provide the greatest leverage against incoming missiles by preventing the deployment of their mirved warheads. A successful boost phase defense could provide a kill ratio of up to ten warheads per missile against the Soviet SS-18 Mod 4 ICBM. This ratio may drop linearly as the missile passes into the post-boost phase when the missile's 'bus' (post boost vehicle PBV) begins dispensing warheads and penaids on their ballistic trajectory. That is, once the 'bus' deploys its warheads or decoys the targeting task multiplies very rapidly thereby lowering the kill ratio. While DEW technologies appear to offer tremendous hope for a strategic defense, they have a number of hurdles to overcome. Din argues that while no major obstacles have appeared which would preclude a DEW eventually being built, "the real question . . . is whether the performance levels and system integration required for effective missile defense can ever be attained".[42] While the U.S. can get around power output levels by increasing the 'dwell' time on a ballistic missile, this avenue has implications for overall battle management. The tracking and assessment systems would have to be very precise in order to achieve a kill. However, increased 'dwell' time may in turn limit the number of targets each DEW platform can handle during an attack in turn requiring more platforms.

The only other means to exert similar destructive leverage against ballistic missiles is an attack on their silos. However, an 'offensive' attack of this nature designed to limit the damage remaining Soviet

forces could cause to the U.S. has a number of major problems. For example, a counterforce attack may not work effectively thereby leaving the Soviets adequate forces with which it could attack the United States. The Soviets also might launch their missiles on warning of a U.S. counterforce attack, thereby negating the attack's original usefulness.

A second tier would entail an early mid-course defense and might involve a number of secondary lasers and kinetic energy kill weapons, including the highly touted 'smart rocks' concepts. The so-called 'smart rocks' concept envisions a number of highly accelerated small projectiles each fitted with a seeker (optical or radar) that can maneuver to impact with a ballistic missile or warhead. Another laser employment method could include ground-based systems. A proposed design would be to fire lasers from mountain top stations through the atmosphere off reflecting mirrors against attacking missiles. While the basic concept is seemingly less complex than deploying an entire defense system in space, the combination of ground and space-based components could increase the battle management complexity. In addition, the propogation of lasers through the earth's atmosphere has been a problem for scientists. Lasers tend to dissipate and lose their concentration while encountering clouds and other atmospheric conditions. Reports in 1984 suggest that scientists at Lawrence Livermore Laboratory have been able to overcome these problems but only under highly controlled conditions. The ground-based laser facility might be less vulnerable than the space-based components and would not be hindered in size by adequate power sources. However, the system's dependency on space-based

mirrors would create a number of operational problems. The mirrors which may range in size from five to twelve meters, and as yet can not be produced, would be particularly sensitive to any marking on their faces. The Soviets could explode a space mine, for instance, laden with sand near by or in the path of the mirror as to degrade the mirror's face adequately to preclude effective laser reflection.

In addressing these shortcomings, laser weapons advocates such as President Reagan's science advisor George A. Keyworth II and Lowell Wood of Lawrence Livermore Laboratory, have argued that some kind of 'pop-up' mirror system might circumscribe the disadvantages of a space-based system. Yet, the time requirements placed on the warning and command and control system to place the mirrors in space and position them to reflect a laser on target would be so severe as to relegate the defense useful only in late mid-course.

Kinetic energy kill weapons such as 'smart rocks' might include the electromagnetic railgun concept where small pellets are accelerated at incredible speeds.[43] The third layer, or late mid-course, also could involve a number of kinetic energy weapons including a system similar to the defense employed in the 'Homing Overlay Experiment' (HOE) which successfully detroyed a Minuteman ICBM in June, 1984. The Army Ballistic Missile Defense Systems Command has begun a follow-on effort to HOE labeled Exoatmospheric Reentry Vehicle Interceptor Subsystem (ERIS). The objective is to demonstrate the effectiveness of a non-nuclear kinetic kill defense for the late mid-course.[44] Another mid-course defense, labeled 'Braduskill', has been described as "a revolutionary new type of rocket interceptor which combines the best of

ground and space-based weapons. It essentially would involve an anti-missile missile designed to shoot up into space and rendezvous and fly alongside a Soviet warhead while firing projectiles at it until it was destroyed.[45] While a number of these defense concepts use relatively less sophisticated technology than boost phase and early mid-course defenses, they also have problems. They are dependent on tracking and pointing technologies which remain unproven.

The terminal defense phase in a countervalue defense could include a number of point defenses around U.S. nuclear forces, command centers, and critical industrial and political targets. These defenses might involve ground-based lasers or shotgun type projectiles such as the 'swarmjet' proposal as well as Sprint-type interceptors.

The basic objective of a countervalue defense is to exert such great defensive leverage over an attacking nuclear force as to greatly degrade its capability by destroying ballistic missiles before they are a greater threat while remaining layers could destroy remaining warheads. Hence, the central goal of this defense is to alter the basis of deterrence and the conditions of national vulnerability by providing a means for assured survivability. However, assured survivability can not be guaranteed by a ballistic missile defense alone. A determined enemy could shift his means of delivering an attack to SLBMs, cruise missiles, and strategic bombers. In order for the U.S. to achieve a truly effective countervalue defense it might not only have to deploy a ballistic missile defense but a strategic air defense to protect against cruise missile and bombers as well as civil defense programs to protect the population from 'leakage'.

While the defense missions outlined above have become more feasible since the start of the SDI research program, they are faced with a tremendously sophisticated offensive threat. Offensive nuclear forces are growing in size, which itself presents a problem for defenses, and are becoming more difficult to defend against. For example, the U.S. has explored manueverable reentry vehicles for its ICBM and SLBM forces and has begun deploying thousands of ALCMs and SLCMs. Both of these later two weapons systems are capable of penetrating Soviet air defenses currently deployed and are projected to penetrate future Soviet air defense systems. The Soviets may follow very similar offensive nuclear weapons development paths, thereby enhancing their ability to assure retaliation in the event of a war.

While the concept of a defense against offensive warfare and nuclear weapons in particular is not new, as discussed in Chapter One, the seemingly fantastic defense methods currently being explored are new. However, this research focus does not represent a radical departure from past activities with respect to the proposition of space-based deployments. The U.S. and Soviet Union have relied on space-based platforms for many years. United States launch detection satellites, communication satellites, and surveillance satellites have been deployed since the 1960s. Hence the concept of 'Star Wars' is somewhat inaccurate.

What the new program does seek to shift is neither the mode of military operations nor their place as such. However, the SDI program may provide some means of reversing the U.S.'s dependence on the threat of nuclear retaliation. This dependence may be lessened whether the

U.S. chooses a counterforce defense, thereby providing some assurance that U.S. retaliatory forces will survive; whether the U.S. seeks to balance a mixture of defense and offense with a countervailing defense; or whether the U.S. chooses to rely on a countervalue defense to preclude the need for retaliation. In all likelihood, the SDI program will require another decade to prove the more exotic weapons and technology feasible. Meanwhile, the offensive nuclear forces of the superpowers will continue to improve and grow.

Endnotes Chapter 2

[1]James R. Schlesinger, "Rhetoric and Realities in the Star Wars Debate", International Security, 10 (Summer 1985), 4.

[2]The two reports were issued by the Future Security Strategy Study Group headed by Fred Hoffman and the Defensive Technology Study Group headed by James Fletcher and are known as the Hoffman and Feltcher Commissions, respectively. The Fletcher and Hoffman Reports led the Department of Defense to establish a Strategic Defense Initiative Organization in 1984 to manage the Strategic Defense Initiative. Both Commission reports remain classified, however, parts of the reports were made public. Rodney N. Jones and Steven A. Hildreth, "Star Wars: The Problem of Strategic Defense," Washington Quarterly, 7 (Fall 1984), 105.

[3]Some strategists further divide the first stage into boost and post boost and up to seven different tiered defenses have been proposed to cover the entire 30 minute missile trajectory. However, for purposes of this study the three main trajectory phases will be used. The boost phase encompasses a 3 to 5 minute period from launch through power boost of the missile up to 200 - 250 kilometers above the earth. That is, this is the period of time when the missile booster engines are burning. During this period a BMD would have a large and easily tracked target to destroy. In addition, the BMD would have a choice of destroying either the missile booster or warhead section. The so-called post boost period occurs just after the missile booster has stopped firing and the warhead 'bus' is deployed and begins releasing its cargo. The mid-course phase last roughly 20 minute and provides the attacking force time to deploy countermeasures as well as take action to confuse the defense. During this period a BMD would have to distinguish real from dummy or decoy re-entry vehicles in order to achieve a high kill ratio. Finally, the re-entry or terminal phase takes a few minutes depending on the attack angle where the re-entry vehicles begin streaming toward their targets. During this pahse ground based defenses would attempt to intercept the re-entry vehicles directly. Allan M. Din, "Strategic Defense Technology, fact or fiction?," International Defense Review, 19 (1985), 29 - 34.

[4]Refer to Chapter Four, Appendices A and B for a complete review of U.S and Soviet nuclear arsenals.

[5]Caspar W. Weinberger, Annual Report to the Congress Fiscal Year 1985, (Washington, D.C.: U.S. Government Printing Office, 1984), pp. 21 - 22.

[6]Ibid. 21.

[7]Refer to Chapter Four, pp. 6 - 14, for a complete review of the current U.S. strategic nuclear arsenal and a description of the modernization programs currently being implemented or envisioned.

[8]"How we got to 'Star Wars'," Washington Post, March 11, 1985, p. 14.

[9]Ibid.

[10]Robert Jervis, "Deterrence and Perception," International Security, 7 (Winter 1982/1983), 13.

[11]Jervis, "Deterrence and Perception," 13.

[12]Soviet Military Power 1985, (Washington, D.C.: U.S. Government Printing Office, 1985), 48.

[13]Charles Krauthammer, "The Illusion of Star Wars," The New Republic, 190 (May 14, 1984), 13.

[14]Edward Teller, "Defense: Retaliation or Protection?," International Security, 3 (Spring 1984), 29.

[15]Ibid.

[16]Walter A. McDougall, "How Not to Think About Space Lasers," National Review, 35 (May 13, 1983), 555.

[17]Ibid.

[18]"Putting American's Defense into Orbit," Business Week, June 20, 1983, 53.

[19]William M. Arkin, "SDI - Pie in the Sky?," Bulletin of the Atomic Scientists, 40 (April 1984), 9.

[20]Arkin, "SDI - Pie in the Sky?," 10.

[21]McDougall, "How Not to Think About Space Lasers," 555.

[22]Ashton B. Carter and David N. Schwartz, Ballistic Missile Defense, (Washington, D.C.: The Brookings Institution, 1984), 84.

[23]While it is conceivable that a counterforce ballistic missile defense could provide protection against attacks on Strategic Air Command bases and strategic submarine bases, the Soviets could circumvent the defense by using cruise missiles launched from submarines, both SSBNs and attack submarines, as well as surface vessels partrolling U.S. coasts. Cruise missiles are reviewed in greater detail in Chapter Four.

[24]Exoatmospheric defense refers to the destruction of ballistic missiles or its components outside of the earth's atmosphere. Endoatmospheric defense, such as the U.S. Sprint ABM from the Sentinal and Safeguard programs, refers to the destruction of ballistic missile reentry vehicles within the earth's atmosphere.

[25]For a review of the various SDI technologies see Allan M. Din,, "Strategic Defense Technology, fact or fiction?." International Defense Review, 19 (1985, 29- 34.

[26]Din, "Strategic Defense Technology fact or fiction?", 30.

[27]Weinberger, Annual Report to the Congress Fiscal Year 1985, (Washington, D.C.: U.S. Government Printing Office, 1884), 186.

[28]See Albert Carnesal and Charles L. Glaser, "ICBM Vulnerability-The Cures are Worse than the Desearse", International Security, 7 (Summer 1982): 70 - 85.

[29]Carter and Schwartz, Ballistic Missile Defense, 6.

[30]Daniel O. Graham, "Toward a New U.S. Strategy: Bold Strokes Rather Than Increments," Strategic Review, 9 (Spring 1981), 13.

[31]Soviet Military Power 1985, (Washington, D.C.: U.S. Government Printing Office, 1985), 30.

[32]See Charles L. Glaser, "Do We Want the Missile Defense We Can Biuld?" International Security, 10 (Summer 1985): 25 - 57, for a review of the potential usefulness of a countervailing defense of U.S. strategic forces and other critical militaryt assets.

[33]Carter and Schwartz, Ballistic Missile Defense, 39.

[34]Ibid, 40.

[35]Ibid.

[36]Ibid.

[37]Ibid, 41.

[38]Ibid.

[39]Ibid, 43.

[40]Din "Strategic Defense Technology fact or fiction?", 31.

[41]Ibid.

[42]Ibid.

[43]Fred Redding, Concept Engineer, Alexandria Virginia, Talk given at Heritage Foundation, May 1985.

[44]"Mid-Course ABM Defense Recommended," Aviation Week and Space Technology, (October 29, 1984), 23.

[45]David J. Lynch, "Star Wars Base In Canada?," Defense Week, July 8, 1985, 1.

CHAPTER THREE

U.S. STRATEGIC NUCLEAR POLICY

The U.S. government and its military policy makers are charged with preserving the security of the nation. For more than 40 years, U.S. strategic security has depended on policies that have emphasized the deterrence of a nuclear war. That is, it is the responsibility of the government to choose the most effective policies that will help prevent serious encroachment on the nuclear threshold between the superpowers. The focus of that effort in the U.S. is called strategic nuclear policy.

The central concern within the policy community is an attempt to answer the following question: How can the U.S. best deter its enemies from launching a nuclear attack on the continental U.S. or its allies today and in the future? The answer to this question lies in U.S. strategic nuclear 'deterrence' policy. While a policy of offensive deterrence has helped prevent a nuclear war for the past four decades, the Reagan Administration has asked if deterrence can be more effectively served by a defensive position or a combination of the two? Yet, these policies by themselves do not ensure that deterrence will always work. Rather, deterrence, taken to mean the prevention of a nuclear war or a war that might lead to the use of nuclear weapons, depends on a multiplicity of conditions defined as a whole as the nuclear balance between the superpowers. Deterrence works as a result of various interdependent factors commonly defined under the rubric of a nuclear balance. These factors include the policies and strategies which would guide the use of U.S. nuclear weapons, the nuclear arsenals

of the superpowers, and the arms control regime which has emerged in an effort to bound the threat of nuclear war in definable and quantifiable relms.

The balance of nuclear power between the U.S. and U.S.S.R. also is dependent on efforts by the U.S. to promote an appreciation by the Soviet Union's leadership for the destructive potential of U.S. nuclear weapons and the U.S.'s willingness to unleash this power if required. 'Deterrence', per se, can not be measured; rather, it is a state of relations between two nations. A principal characteristic of the nuclear balance is that this relationship is never static, but is generally stable. That is, the strategic relationship between the superpowers is fluid such that changes in policy and deployments of weapons often alter perceptions concerning the balance. However, the balance is considered 'stable' in that neither superpower can quickly obtain a preponderance of power nor is the balance currently subject to events or conditions that are likely to lead to its collapse. A condition of strategic 'stability' is critical to the preservation of deterrence in the eyes of U.S. strategic theorists and policy makers.

Strategic stability is a condition where the nuclear balance does not currently favor either superpower and is less likely to collapse under strain. An important issue that policy makers must contend with is determining the critical elements of strategic stability and the means of ensuring that they are preserved. In the most general sense, strategic stability "concerns the level of risk of a nuclear war occurring at a given point in time".[1] The basis of that risk is the threat of massive national destruction from a nuclear attack.

The preceeding chapters have provided an overview of the arguments both for and against defense as well as the various defense objectives and the important issues concerning the current defense debate. Chapter One highlighted the original debate about defense and indicated where more recent arguments in support as well as against defense are similar and different in substance from the original debate. The central character of the new debate centers around a powerful political constituency in the Reagan Administration which favors the notion that offensive dominated deterrence may no longer provide an effective deterrent against Soviet aggression. Reagan's defense proposal, currently embodied in the strategic defense initiative, also suggests that the threat of a nuclear war might be transcended, in practice, by a whole array of new defense technologies that might place a defense system in a favorable position relative to offensive forces.

This notion of a defense dominated strategic nuclear balance is not new. "Since the advent of nuclear weapons, presidents . . . have sought an alternative to a strategy of deterrence based on the threat of massive retaliation and to a situation where the U.S. is vulnerable to catastrophic destruction."[2] Yet, each president beginning with Eisenhower, having considered substituting defenses, has rejected them and has subsequently revised U.S. strategic nuclear policy, (with) flexible response, limited nuclear options, and the countervailing strategy being the most prominent additions.[3] Distinct from previous periods of consideration, strategic defenses currently enjoy both political and policy support at the highest levels of the government and the Department of Defense. However, not only do defenses enjoy greater

support but the strategic defense initiative is characterized as a possible "revolutionary change in strategic doctrine and the strategic relationship of the superpowers".[4]

Whatever the technological results of the SDI research program, there may be profound changes in U.S. strategic nuclear policy in coming decades. The U.S. is likely to consider strategic defense weaponry more critically important to the future of the strategic balance. In addition, space could become an essential sphere of military operation for other than intelligence gathering and communication links. The new strategic defense debate is three years old and many arguments have been made both pro and con which would have been expected at this point. However, much of the focus of the debate has been on particular aspects of the proposed system or on the general conceptual defense scheme. For example, the Reagan Administration emphasizes a strategic defense for countervalue purposes while other officials, both in and out of government, discuss the appeal of a counterforce or countervailing defense. Some defense critics focus on specific technological stumbling blocks such as the development of sophisticated battle management software for a multi-tiered, space-based, countervalue defense system.

Other analysts pose a number of difficult questions to the overall conceptual value of a strategic defense.[5] While the debate continues to rage between opponents and proponents of strategic defenses, a number of political and strategic policy implications of a strategic defense are ignored. Neither the Reagan Administration's Department of Defense nor any of the major opposing organizations, such as the Union of Concerned Scientists or The Coalition to Save the ABM Treaty, have produced major

studies addressing the implications of a U.S. strategic defense for U.S. deterrence policy. This kind of study must be made in order to address the implications for U.S. nuclear strategy, the future of U.S. nuclear forces, and U.S. arms control policy.

I. U.S. NUCLEAR POLICY IN REVIEW:

An understanding of the possible implications of strategic defenses can begin with a review of U.S. strategic nuclear policy, its principles, its evolution over the past three decades, and its current composition. During this period, U.S. strategic nuclear policy evolved from 'essential deterrence' to a 'sophisticated deterrence' policy. United States strategic nuclear forces have been progressively charged with increasingly more difficult and complex objectives as defined by U.S. policy. This evolutionary process has been influenced by two major trends. On the one hand, the conditions about which the nuclear balance is defined have changed. United States nuclear superiority has been overcome by rough strategic nuclear equality; the superpowers possess roughly equal capabilities to threaten the other with massive levels of destruction by executing a nuclear attack.

The U.S. also has sought to preserve its national security in the face of a changing strategic balance by adjusting its nuclear policy and developing strategic weapons to support new policies. However, for various political, economic, and strategic reasons, the U.S. has emphasized restructuring its nuclear policy rather than procuring new weapons. The Reagan Administration's strategic defense proposal is

designed, in part, to relieve U.S. nuclear policy from attempting to achieve strategic objectives that it may be unable to meet. For example, current U.S. nuclear policy is unsuited to an effective damage limiting strategy. An effective damage limiting strategy is likely to require sizable first strike employment options as well as new strategic offensive and defensive weapons. In addition, the U.S. might have to further refine and upgrade its command-control-communication capabilities to support and execute a damage limiting strategy.

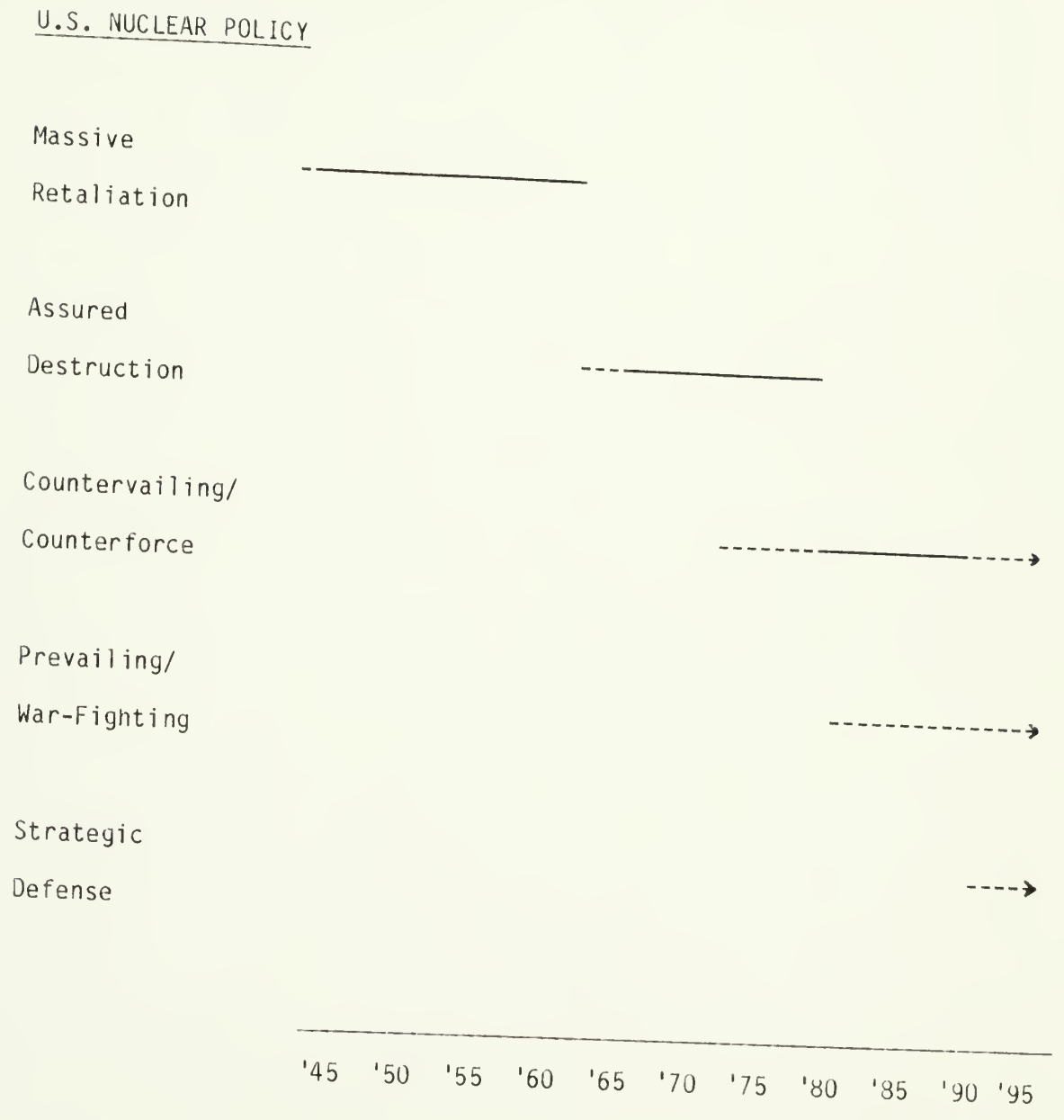
Given the possible implications for U.S. nuclear policy, this chapter will explore the components of U.S. strategic nuclear policy and the direction in which it may be headed as a result of the current debate over strategic defenses. As such, the chapter will outline and review the major elements of current U.S. strategic nuclear policy and analyze whether strategic defenses conform with each policy's objectives. An additional objective of the chapter is to describe what a U.S. strategic defense policy might look like should defensive technologies prove useful and should the U.S. deploy a defensive system. Finally, the question of strategic nuclear stability will be raised in the context of a defensive transition. In order to assess possible implications for U.S. policy, both U.S. domestic political and strategic constraints as well as Soviet efforts to deny the U.S. an effective defense will be outlined.

U.S. strategic nuclear employment policy -- the strategies and plans which might guide U.S. attacks during a nuclear war -- is currently informed by elements from three distinct strategic nuclear policies: an assured destruction/retaliation policy, a countervailing

policy, and a nuclear war-fighting policy. The periods in which individual policies have dominated are portrayed in Table 3.

The incorporation of a 'Strategic Defense' policy may alter the present U.S. nuclear policy mix in favor of a policy for defense dominated deterrence. The scope and purpose of changes to U.S. nuclear policy by a strategic defense are dependent on the technologies and their missions that may be proven useful for a defense. A second factor influencing changes to U.S. nuclear policy may be the level of effectiveness which a defense system can be expected to achieve. Given the number of uncertainties involved in answering these two questions, the U.S is likely to retain many

TABLE 3. THE EVOLUTION OF U.S. NUCLEAR POLICY



elements of its current nuclear policy mix both during a defense transition and during the initial phases of a defense dominated world. That is, the U.S. is unlikely to discard its offensive nuclear forces or the principal objectives of their employment strategies for fear that the Soviets might develop effective countermeasures to a U.S. strategic defense. In addition, the development of a perfect defense against ballistic missiles, one that would destroy 100 percent of the ballistic missiles unleashed in an attack does not preclude the delivery of nuclear weapons by other means such as strategic bombers, cruise missiles, or clandestine placement.[6] In the absence of an effective defense to combat these delivery options, such as strategic air defenses, the U.S. is unlikely to dismantle its offensive nuclear forces. United States offensive nuclear forces are likely to continue to act as an effective deterrent against a possible Soviet nuclear attack at least during the defense transition phase. In conclusion, policy guidance for offensive nuclear forces that are retained by the U.S. could be informed by current nuclear policy as well as by a newly implemented strategic defense policy.

United States strategic nuclear policy is derived from U.S. deterrence theory which represents the way in which U.S. theorists and strategists view the nuclear threat against the U.S. and its allies. A basic principle of U.S. deterrence theory since the 1940s is that nuclear weapons only can be used to deter their use by another nation. This principle stems from the tremendous respect U.S. political and military leaders have for the destructive capability of nuclear weapons. As observed by U.S. policy makers of the 1940s, nuclear weapons were a

tremendous threat to the basic fabric and structure of modern society, namely progressive economic growth and its attendant benefits. United States theorists believed, at least in the abstract, that the initiation of a nuclear war was unthinkable and was unlikely to ever happen. However, a second principle requires that the threat to use nuclear weapons be credible in the event of an attack on the United States. Maintenance of a credible threat subsequently has required that war plans be developed to allow the U.S. to execute a response to an attack.

These principles only speak to the original vision of deterrence. That vision isolated nuclear weapons such that they are useful only to deter their use. The expansion of U.S. national security requirements in the 1940s and 1950s was supported, in part, with the expansion of the role nuclear weapons might play in assuring U.S. security. The Eisenhower Administration drastically reduced conventional arms procurement in favor of relying on U.S. nuclear forces to deter aggression below the strategic nuclear level. This evolution in deterrence thought represents the central tension in U.S. deterrence theory for the past four decades. That tension can be represented by the following question: what is the most effective way to deter a nuclear war? Is it the result of an ultimate threat to punish an attacker, to threaten a potential attacker with the possibility of defeat at any level of warfare, limited or massive, or the ability to defend effectively against a nuclear attack?

A. Assured Destruction Policy:

The U.S. has depended on a policy of assured destruction to deter a

nuclear war for most of the past 25 years. The central idea behind the assured destruction policy is that deterrence is maintained by the threat of 'unacceptable' national destruction in the event of a nuclear war. The threat of national destruction exists because the superpowers are vulnerable to a nuclear attack and possess nuclear forces capable of causing tremendous levels of destruction. In addition, while the U.S. and Soviet Union have actively explored strategic defense against nuclear weapons neither nation has yet developed an effective means to defend against a nuclear attack. Yet, a condition of national vulnerability does not of itself preclude a nuclear attack. In fact, traditional military thought would suggest that vulnerability to attack is more of an invitation to attack than a deterrent to it. The critical component of assured destruction policy is that the threat of unacceptable damage can be maintained by possession of an invulnerable strategic nuclear force. That is, the deterrent credibility of assured destruction policy relies on the invulnerability of the nuclear forces backing the policy. The label 'mutual' was attached to assured destruction, hence the acronym MAD, in an effort on the part of the U.S. to gain recognition by the Soviet Union that national vulnerability is a 'fact' of the nuclear era that applies to all nations and one that cannot be avoided or changed.

The doctrinal basis of the assured destruction policy school is that nuclear weapons have rendered traditional ideas about the relationship between military forces, national defense, and the politics of war obsolete and dangerous.[7] Therefore, the most important objective for assured destruction policy is to prevent the use of nuclear weapons

as an instrument of war or political influence. Assured destruction theory suggests that nuclear weapons are useful solely as a deterrent to nuclear war. Adam Garfinkle summarized the view held by assured destruction theorists with respect to nuclear weapons as the means to "ensure that nuclear weapons are not used by maintaining a balance of power between the nuclear superpowers, which rests on a rough equality of risk, known as deterrence, or the mutual vulnerability to a nuclear attack".[8]

The risk posed by each superpower to the other is the threat of unimaginable destruction from a nuclear retaliation to an aggressor's attack. The level of destruction generally has been cloaked in terms of the number of deaths/casualties and the degree of economic destruction that would be caused by attacks on cities and industrial centers. In effect, the two superpowers possess the capacity to threaten and punish the other with massive urban-industrial destruction such that recovery from this attack might only be measured in years if measured at all.

The central strategic character of assured destruction policy can be described as a threat to 'punish' an enemy in the event that an enemy attacks the U.S. or its allies with nuclear weapons. An assured destruction threat essentially served as the basis of U.S. deterrence policy throughout the 1950s, the 1960s and early 1970s. A key element in U.S. employment strategy designed to implement a threat of punishment as alluded to above is known as countervalue targeting, or the deliberate targeting of Soviet population and industrial centers.

Countervalue targeting in U.S. war plans began shortly after World War II when the U.S. began searching for a policy to guide the use of

its newly found military power. Some of the earliest war plans to incorporate nuclear weapons, such as FLEETWOOD, called for dedicated attacks on Soviet cities. The targets of a U.S. countervalue attack would have been Soviet population centers as well as some portion of the Soviet Union's industrial base. Both targets were believed to hold considerable value to the Soviet leadership and thereby the threat of their destruction to be sufficient to deter Soviet aggression. A follow-on war plan, labeled DROPSHOT, resulted from a review of the FLEETWOOD plan by the Harmon Committee established in 1949. It specified massive attacks on all major cities in the Soviet Union and communist world.[9] The DROPSHOT war plan provided the president with a single attack option and did not require the military to withhold any nuclear forces in reserve for subsequent attacks. The number of deaths expected from the unleashing of DROPSHOT was estimated between 360 and 525 million throughout the communist world.[10] Together, these war plans and others came to be known throughout the 1950s as a policy for massive retaliation. The basis for massive retaliation -- the destruction of a considerable portion of the Soviet Union's urban-industrial base -- served to confirm the foundation upon which U.S. assured destruction policy has been based.

An important factor constraining the targeting complexity of U.S. war plans in this period was the weapons technology available to the United States. The delivery systems of the 1940s and 1950s, namely B-36 and B-52 strategic bombers, were not very accurate and thus were not particularly useful for targeting specific military assets. For example, the U.S. could not confidently target and destroy Soviet

bombers or naval vessels at bomber or naval bases, respectively. However, air bases and naval yards could be attacked with very large nuclear weapons that would likely result in damage to aircraft and ships as well as surrounding areas. The level of collateral damage that would have resulted from the targeting of military assets in the Soviet Union with the megaton yield weapons carried by U.S. strategic bombers in the 1950s was essentially just as great as direct population targeting.

The Eisenhower Administration decided in 1960 to incorporate the various nuclear war plans of the individual arm service branches into the Single Integrated Operational Plan, or SIOP. The idea was to allocate weapons more effectively and preclude the potential dual targeting of a single target by the different branches.[11] The Kennedy Administration furthered the centralization of the war plans under the direction of Secretary of Defense McNamara and also began an effort to provide the President with attack options other than a single massive retaliation.

McNamara's initial public effort was to reject the massive retaliation policy and develop counterforce options such that the U.S. could attack Soviet strategic nuclear forces and other military assets if it choose to do so before resorting to attacks on Soviet cities. The idea behind this effort was to provide a 'controlled' means for keeping the superpowers from escalating to all-out nuclear war too quickly.[12] Attacks on military assets rather than civilian centers appeared to McNamara to make more sense for deterrence; by limiting the size of U.S. retaliatory strikes, civilian populations might be spared somewhat.[13]

The introduction of the 'no-cities' approach resulted in resounding

public and allied criticism as an attempt to make a nuclear war more palatible and hence more likely. Politics and economics also played a critical role in McNamara's decision to shift in favor of assured destruction policy. The Air Force, increasingly enamored by the ICBM, had estimated that it would require 10,000 ICBMs to implement a true counterforce targeting strategy. In effect, the cost of U.S. strategic programs would have jumped tenfold in order to meet the Air Force's requirement. The Navy also is likely to have sought a greater number of weapons to perform a counterforce mission. However, the most important obstacle continued to be the capabilities of U.S. nuclear forces. The most advanced U.S. weapons of the early 1960s, carried on Titan II and Minuteman I ICBMs, were fairly inaccurate and of sizeable yields. Clearly, these forces were unsuited for discriminate surgical strikes of the kind required by a counterforce strategy. The U.S. would have been unable to confidently target Soviet ICBMs and bomber bases with its strategic force without causing considerable collateral damage. While McNamara publicly downplayed the counterforce and damage limiting aspects of U.S. nuclear policy his annual budget statements continued to reflect their roles until 1967. By 1967, assured destruction policy was formally and solidly in place.[14]

The U.S. continued to develop the notion of 'flexible response', especially in the NATO arena, and attempted to provide a greater number of attack options in the SIOP.[15] A new SIOP, introduced in 1961, incorporated the 'flexible response' concept into U.S. targeting strategy. It provided the President with a greater number of attack options, the final category and option representing an all-out

retaliatory attack on Soviet cities, while other options involved graduated attacks on both military and urban- industrial target sets.[16] In sum, although the U.S. began to provide options in the SIOP, the notion of deterring the Soviets continued to rely primarily on a strategic posture to unleash massive destruction. In addition, as Soviet ballistic missile forces grew throughout the 1960s the ability of the U.S. to carry out an effective counterforce and damage limiting strike began to dwindle correspondingly.

In support of the shift to assured destruction policy, McNamara argued "that the enemy's certain knowledge that it would be destroyed in a war prevented one from breaking out".[17] Hence, the confirmation of assured destruction policy was not strictly for public consumption but, in practice, it was the only credible threat the U.S. was capable of carrying out. The targeting requirements for an assured destruction policy were defined by McNamara in 1965 as the capability to destroy one quarter to one third of the Soviet Union's population and two thirds of its industrial capacity.[18] In effect, McNamara envisioned a policy to threaten to punish the Soviet Union should it attack the U.S by destroying assets of 'value' and concluded that this policy was the most effective and credible deterrent.[19]

The U.S. has retained elements of its assured destruction policy and associated capabilities since the mid 1960s. Each succeeding administration since the Kennedy Administration has continued to emphasize a U.S. assured destruction deterrent. The policy has been refined as the focus for targeting has shifted from populations to 'economic recovery resources' such as key economic infrastructures and

military related production facilities. However, the requirements for causing massive destruction to the Soviet Union by a U.S. retaliation has already come under scrutiny by the first few months of the Nixon Administration. Its doctrine for strategic sufficiency, while firmly establishing strategic parity as a basis of the nuclear balance, began the process of revising U.S. SIOP employment options which led to Limited Nuclear Options, Presidential Directive 59, and the Reagan Administration's war-fighting policy.

A variation of the assured destruction/retaliation policy school, often referred to as the 'minimum deterrence' school, has become more vocal in recent years as the U.S. has moved away from assured destruction in favor of more selective and limited nuclear options. Its proponents suggest that both superpowers possess more than sufficient strategic forces to 'destroy' each other's nation and, therefore, neither side needs to deploy greater numbers nor more capable nuclear forces. Minimal deterrence theorists argue that both sides, in fact, could unilaterally dismantle hundreds of weapons without degrading their deterrent posture. A popular proposition with minimum deterrent advocates is for the U.S. to dismantle all but a few Poseidon or Trident Submarines, each capable of attacking an average of 160 and 192 Soviet cities respectively.[20] President-elect Carter initially favored a return to a minimum deterrent and suggested that a U.S. submarine fleet of 200 warheads would be sufficient to deter a Soviet attack.[21]

Louis Beres, a leading proponent of the minimum deterrence school, has suggested the U.S. seek to implement three general steps to achieve a minimum deterrence posture while maintaining an assured destruction

posture. Beres calls for the U.S. to reemphasize the intolerability of nuclear war in order to pressure the Soviet Union to halt its arms buildup; create an agenda for international security that begins with removing incentives for states to acquire, enlarge, or refine nuclear weapons; and finally, Beres calls for the U.S. to renunciate the 'first use' option by strengthening conventional deterrence.[22] The basis of these arguments is that assured destruction capabilities, possessed by both superpowers, is a reality that can not be avoided. In addition, Beres suggests that possession of ever more capable nuclear weapons does not translate into an effective means for terminating a nuclear war on acceptable terms as some proponents of limited nuclear options suggest.

The assured destruction school charges that the central function of nuclear weapons is to deter an enemy's attack and a measure by which deterrence can be weighed is the stability of the strategic balance. That is, deterrence can work effectively when the balance is stable and is susceptible to breaking down when the balance becomes destabilized. Harmful to the stability of the balance are actions which undermine the parity of forces between the superpowers. Principal among these actions are attempts to erode the other superpower's confidence in their assured destruction and assured retaliation capability. Hence, all counterforce targeting strategies and weapon systems are inherently destabilizing according to assured destruction theorists.

Among the more destabilizing activities is the development and deployment of defenses against nuclear weapons, both passive and active. Passive defenses are destabilizing because they seek to limit the damage an enemy can inflict on a particular target, thereby degrading the

attacker's assured destruction credibility. For example, civil defenses which are designed to protect civilian populations would partially remove the attacker's intended target. While civil defenses might protect some portion of a population from the direct effects of an attack, i.e. overpressure and thermal destruction, it is not considered an effective defense by U.S. officials. Soviet missiles might be re-targeted to hit areas where U.S. civilians had been relocated. Additionally, the Soviets could employ more weapons or greater weapons yields to accomplish some level of destruction.

More importantly for President Reagan's defense proposal, assured destruction policy suggests that active defenses are radically destabilizing for a number of reasons. "A consequence of this view is that only offensive forces can directly contribute to deterrence."[23] Finally, for an assured destruction advocate "anything that interferes in any measure with the other side's ability to inflict assured destruction is destabilizing - in crises it is supposed to induce premptive attack and, in the long term, military competition becomes a spiraling nuclear arms race with unlimited increases in the potential for indiscriminate destruction on both sides".[24] Therefore, all efforts to incorporate defenses and ABMs, in particular, are opposed by assured destruction theorists.

While assured destruction policy suggests that defenses are dangerously destabilizing, the deployment of missile defenses by the superpowers my make countervalue targeting as prescribed by assured destruction policy the only practical option for offensive forces. Missile defenses will degrade the superpowers' abilities to execute

precise counterforce attacks thereby lessening their confidence of success. Hence, the requirements of countervalue attacks which are much less precisely defined in terms of weapons accuracy and damage expectancies could serve usefully as the employment objectives for offensive nuclear forces in a defense dominant world.

B. Limited Nuclear Options and Countervailing Policy:

American nuclear policy has evolved over the past 40 years, although some would argue that what has really happened is that a series of radical shifts have occured in the face of technological progress. The foundation of the assured destruction policy of the 1960s and 1970s has been questioned recently by a number of nuclear strategists. These strategists, such as Paul Nitze and Colin Gray, do not view assured destruction policy or posture as adequately credible to preserve U.S. security in the coming decades. Nitze, a government nuclear policy advisor for the past thirty years, has charged that the U.S. has needed more flexible and 'rational' nuclear policies for most of those years. Gray, an advisor to the Reagan Administration, has charged that a growing Soviet war-fighting capability could pose a serious and dangerous threat to the ability of the U.S. to deter a nuclear war in the future.

Both Nitze and Gray have argued that the U.S. needs to promote U.S. war-fighting options and capabilities. While few Presidents publicly emphasize these conclusions, there has been a progression toward more limited nuclear employment options since the late 1960s and especially since the early 1970s. Secretary of Defense Schlesinger for the Nixon

Administration called for the incorporation of selective and limited nuclear options (LNOs) in the SIOP as a means of enhancing U.S. deterrence credibility and to limit a nuclear war should it breakout.

The Nixon Administration's nuclear policy review led to the promulgation of LNOs in U.S. war plans. National Security Decision Memorandum 242 signed by President Nixon in 1974 "directed that further plans for limited employment options which enable the U.S. to conduct selected nuclear operations be developed and formally incorporated into the SIOP".[25] An additional focus of the new policy was targeting of Soviet post-war recovery assets to include political, economic, and military resources.

The central concept of LNOs was 'escalation control'. Desmond Ball describes this as provision of the NCA "with the ability to execute selected options in a deliberate and controlled fashion thoughout the progress of a strategic nuclear exchange".[26] The idea was to hold certain enemy targets at risk for later destruction in order to provide an enemy time to consider action. Additionally, certain targets would be withheld from destruction such as populations. That is, populations would not be a direct target although massive collateral damage to Soviet population centers was still likely to occur from a U.S. attack. Ultimately, the U.S. was seeking to impart the notion of intra-war deterrence into the strategic equation.

Much of the recent policy debate has been structured by concerns raised by the LNO development process. The decision and enactments pursuant to Presidential Directive 59, which engraved 'countervailing nuclear policy' in U.S. deterrence theory, marks the formal era of a

more flexible and dedicated nuclear counterforce policy. Presidential Directive 59 placed the U.S. firmly in the limited employment camp. The U.S. now is more likely to retaliate against a Soviet initial strike using selective and limited attack options before using more traditional massive attack plans.

The evolution of U.S. strategic nuclear policy toward limited attack options represented the most important development in U.S. nuclear policy until President Reagan's strategic defense proposal. As implied by its name, a countervailing policy suggests that the U.S. prepare to fight and fight a nuclear war to deny an enemy's wartime objectives in order to pursuade him to back down from the conflict. The notion of preparing for a nuclear war is fundamentally different from the traditionally accepted means of deterrence espoused by assured destruction theorists and assured retaliation policy. Whereas assured destruction theorists argue that deterrence works because the threat of overwhelming punishment is credible, countervailing policy theorists suggest that the threat to punish the Soviet Union is no longer adequate to deter Soviet leaders in all instances. Even though the U.S. had incorporated flexible and limited nuclear options in the SIOP prior to 1980, it had not sought to procure effectively specific weapons systems in a dedicated manner that would match U.S. policy, targeting strategy, and weapons.

Much of the debate surrounding Presidential Directive 59 centers on the following question: How will the U.S. use its nuclear weapons in the event of a nuclear war? Although the U.S. has always maintained specific employment policies for using its nuclear forces--traditionally

called warplans and now embodied in the SIOP -- these policies have been relatively unsophisticated and organized around the idea that a nuclear war was highly unlikely. This view prevailed throughout the 1950s and 1960s and is still discussed in public context for political reasons, one of which is support for arms control. In addition, where these plans were drawn up they generally sought to destroy very wide area targets such as population centers and industrial plants. "The targeting consideration that relate to counterforce strategies are . . . very different" as requirements to destroy military installations or specific weapons are in practice much more difficult.[27] A number of factors may have begun calling into question the deterrence 'guarantee' of U.S. strategic nuclear policy and has led U.S. policy planners to gravitate toward more demanding nuclear strategies.

The first of these factors is the ever increasing sophistication and capabilities of both U.S. and Soviet nuclear forces. That is, some truth exists in the proposition that technology often leads policy. While the U.S. actually sought to restrain further improvements in the accuracy of its forces after the SALT I accords, the increase in Soviet capabilities eventually convinced a number of U.S. policy makers that the U.S. required more advanced weapons. The most controversial example has been the MX ICBM.

Some nuclear weapons today and ICBMs in particular can be extremely effective weapons for attacking a variety of targets in a discriminate manner. The issue of attack discrimination and its meaning for U.S. strategic nuclear policy will be addressed later in the chapter. The improvements in the U.S.'s ability to discriminate in an attack

(generally defined as the differences between massive collateral destruction and selective strikes), has largely been the result of technological improvements in nuclear weaponry. For example, the U.S. Minuteman III ICBM deployed with the Mark 12A warhead and NS-20 guidance package has a circular error probability (CEP), equivalent to 1/10th of a nautical mile 50 percent of the time. If Soviet ICBM launch silos are hardened to withstand 2000 psi, as they have been assessed by some analysts, the Minuteman III is theoretically capable of destroying roughly 750 Soviet ICBMs in a two warheads per silo attack representing roughly half of the Soviet ICBM force.[28] Improvements in warhead accuracy and lethality allow the U.S. and Soviet Union to use nuclear weapons in a more traditional military fashion.[29] Nuclear weapons can be used to destroy much smaller military targets than before as part of an effort to prevent an enemy from achieving his military objectives.

A second factor which potentially weakens the notion of a deterrence 'guarantee' is a weakening of the idea that neither superpower can truly possess a strategic advantage and that, consequently, the superpowers are destined to remain under the balance of terror until both disarm. This notion, wedded to the assured destruction theory, suggests that the balance is an unavoidable fact of the nuclear era which can not be changed and in which neither superpower can achieve meaningful advantages. Presidential Directive 59 is predicated on the idea that the Soviet Union has probably never accepted this view and has clearly never based its weapons development on a strict interpretation of the assured destruction theory. In fact, PD59 suggests that the Soviets have not only never espoused this view of

deterrence theory but have been actively seeking to procure the weapons and associated infrastructure to fight a nuclear war. This kind of asymmetry, argue countervailing policy proponents, has left the U.S. open to a dangerous weakening of its deterrent capability.

William Odom and Zbigniew Brezinski, major architects of PD59, have argued that assured destruction theory is not consistent with Soviet strategic nuclear doctrine which has always seen nuclear weapons as weapons in the conventional sense. Odom and Brezinski also have claimed that the Soviets were impressed during the Cuban missile crisis that nuclear weapons were useful to the U.S. and as good students of Clauswitz, the Soviets believe nuclear weapons are a tool of power, albeit a dangerous tool, in support of their politics.

Attendant to a countervailing policy is the necessity of being prepared to fight a nuclear war due in part to the emergence of a massive Soviet effort to deploy a war-fighting capability. A number of theorists suggested during the 1970s that the Soviet leadership was composed of a group of 'realists' and that it would not base decisions on initiating or fighting a nuclear war solely through Marxism-Leninist lenses. However, it is unlikely that the current Soviet nuclear force was procured strictly to support a policy of deterrence. Public statements of policy by Soviet leaders could lead U.S. policy makers to believe that Soviet nuclear forces exist only to deter an aggressive Western alliance, dominated by the United States, and that these weapons have no other function. Yet, a careful review of the size and capabilities of Soviet nuclear forces provides a better understanding of Soviet doctrine and strategies. The Soviet SS-18 ICBM, while clearly

deployed to deter the U.S. from attacking the Soviet Union, has the capability to threaten the destruction of U.S. ICBMs and other hardened U.S. military installations. These types of forces, arrayed with Soviet strategic defense efforts, may be indications of a policy for other than pure deterrence.[30] That other policy, according to countervailing strategies, is an effort to prepare to fight, 'win', and recover from a nuclear war with the United States.

The combination of technological push and Soviet efforts to acquire an effective nuclear war-fighting capability have led U.S. military and policy communities to question the validity of basic assumptions in U.S. employment policies. That is, in view of the preceeding factors, can the U.S. continue to base its security on the threat of an assured destruction response to a nuclear attack when that attack may leave the U.S. few choices between losing the war and massive destruction? It was this dilemma that drove McNamara and Schlesinger to propose more flexible and limited options for the SIOP. The purpose was to preclude a choice between surrender and massive destruction. Today, the U.S. can choose among a number of options to respond to a Soviet attack. These responses can be limited in size and selective in the target set so as to preclude widespread destruction. As such, the U.S. is no longer faced with accepting surrender or massive destruction. However, a number of strategists continue to fear that the U.S. may be faced with a problem of self-deterrence. The U.S. might believe that it should not or cannot retaliate against a Soviet nuclear attack because the size of a U.S. retaliation, being dictated by the nuclear forces it possesses, would be so massive as to bring about a similar follow-on attack by the

Soviet Union. While successive administrations since the Kennedy Administration have reviewed U.S. nuclear policy and added more flexible options to the SIOP, these efforts did not produce a policy or posture which prepared the U.S. for fighting a protracted nuclear war.

An important constraint on the U.S. ability to prepare itself for protracted war has been the U.S. command-control-communication network designed primarily to warn the U.S. of an attack and allow it to retaliate. Not until the Carter Administration had the U.S. C3 network been reviewed for anything approaching a war-fighting capability.

The basic objective of Presidential Directive 59 was to enhance deterrence and also to alter the terms upon which deterrence is maintained. According to the Directive, it may be necessary to prepare to use nuclear weapons in order to maintain a credible deterrent. United States nuclear policy as informed by PD59 stresses the possible use of nuclear weapons in a war between the superpowers and suggests that the best means to deter aggression is to prepare to defeat an enemy rather than threaten punishment that may not be credible in the eyes of the enemy. In other words, the U.S. could be self-deterred during a crisis or war and thereby severely harm U.S. security if the U.S. does not maintain options to assured destruction attacks.

The purpose and structure of the countervailing policy is as follows: its main objective is to deter a nuclear war and thereby further the security of the U.S. and its allies. The central question addressed by the Carter Administration's review of U.S. nuclear policy that led to Presidential Directive 59 was whether the U.S. could continue to deter a nuclear war in the face of Soviet challenges that

were eroding the foundation of traditional U.S. deterrence policy. Countervailing policy advocates claim that once the strategic balance had reached a rough parity between the superpowers, a rational employment policy became necessary.[31] For countervailing strategists, once the U.S. lost nuclear superiority in the early 1970s, U.S. policy could no longer simply focus on the levels of damage the U.S. could inflict above and beyond Soviet capabilities but had to begin focusing on how well U.S. forces would fair in a nuclear war where Soviet forces were roughly capable of the same levels of damage.

It was important to Carter Administration theorists to advance U.S. policy in a credible manner that could deter the Soviets. The method decided upon was to show the Soviets that the U.S. was capable of fighting a nuclear war and possessed options in the SIOP to make this capability credible. United States assured destruction policy up to this point had not required an expansion in the size or sophistication of U.S. nuclear forces so long as they remained invulnerable. The deployment of more capable forces by either superpower was believed only capable of upsetting the nuclear balance. The U.S. choose to upgrade its nuclear forces during the 1970s and began to deploy new systems only in the 1980s. These decisions were influenced by the technological advancements in nuclear weaponry, Soviet strategic efforts, and domestic political factors as well as requirements of PD59.

In essence, the Carter Administration began to bring U.S. nuclear policy in line with the progress of technology. In addition, the Administration accepted arguments that the Soviets never truly accepted deterrence theory based on assured destruction. The assured destruction

theory claimed that the superpowers would have no need to deploy more deadly and capable nuclear weapons. However, an assured destruction nuclear balance only works if both superpowers base their policies and nuclear force postures on a similar understanding of the theory.[32] Odom has pointed out that the United States had always been organized under the massive retaliation policy of the 1950s and assured destruction policy of the 1960s and 1970s for a short devastating war.[33] He also claimed that once the U.S. had organized itself for a quick massive nuclear war, that was exactly what the United States would get. While there may be some truth to this proposition, U.S. political, economic, and strategic constraints are likely to influence policy makers to consider other less apocalyptic avenues. It is not altogether politically appealing to maintain that a U.S. nuclear retaliation will be massive as such an attack is likely to invite an equally massive strike on the United States. Odom also understood that the military finds it difficult to change its view of the strategic world. Once a particular strategic perspective has become embedded in the military's psyche, it may require a number of years to change those views and implement a new policy.

Presidential Directive 59 formally codified a set of targeting studies that are at the heart of the countervailing policy. While PD59 was not a new doctrine and did not alter NSDM 242, it did contain three new features. First, U.S. policy would no longer emphasize targeting to prevent Soviet economic recovery but would focus on war supporting infrastructure. Secondly, the preplanned SIOP options were to be supplemented by the ability to select new targets and destroy them

during a war. Finally, PD59 placed greater emphasis on enhancing U.S. C3 systems to support a policy of extended nuclear war fighting.[34] The central objective of the targeting studies was "to identify smaller target sets and related targets that might be selectively destroyed in the early stages of a nuclear war".[35] The initial reviews concluded that Soviet strategic defense measures such as the hardening of missile silos and command bunkers as well as civil defense efforts were considerably more effective than previously thought. The Carter Administration concluded that the U.S. might not be able to destroy 60 percent of Soviet 'recovery assets' as prescribed by U.S. nuclear policy enshrined in 1974.[36] An additional conclusion drawn from the reviews was that the biggest U.S. weakness rested in its command-control-communication and intelligence (C3I) networks. These deficiencies were seen by the Carter Administration's analysts as critical because of the perceived need to be able to control the war and negotiate while conducting a nuclear war in hopes that the war could be ended prior to it reaching spasm attacks on cities.[37]

While U.S. C3 systems were adequate by most assessments for launching a retaliation to a Soviet nuclear attack, only in the case where protracted warfare is envisioned does enduring C3I capabilities make sense. Nitze, Gray, and others also claim that war-termination requires enduring C3I capabilities. However, C3I of the kind envisioned by the Carter Administration review are more closely associated with escalation dominance. The U.S. may require enduring and redundant C3 capabilities to prosecute a nuclear war in a so-called 'controlled' fashion. Escalation dominance is commonly thought of as the ability to

control the course of a nuclear war in a certain manner by raising the stakes for an enemy while holding down one's own risks at the lowest possible level of conflict. However, once nuclear war reaches an intensity where hundreds if not thousands of weapons are used in each strike, escalation has already progressed out of control and the war is then often termed 'spasm' warfare. For countervailing theorists, controlling a nuclear war is synomous with escalation dominance.

The operational strategy that has emerged from PD59 has a distinctly traditional military cast to it. United States countervailing policy places heavy emphasis on selected, flexible, and limited nuclear options in the SIOP, counterforce weapons, and on the C3I capabilities that would be needed to fight a nuclear war over an extended period.

The Carter Administration immediately set out to provide U.S. forces with the means for incorporating PD59 recommendations into actual war plans. War plans were developed and implemented in the SIOP by way of the nuclear weapons employment policy (NUWEP) first established in the early 1970s in conjunction with LNOs. The new NUWEP increased the number of targets the U.S. could attack from 15,000 to roughly 40,000.[38] Carter also called for full development of a mobile race track deployable MX ICBM in order to provide the U.S. a less vulnerable hard target kill capable weapon than the Minuteman III. Finally, Carter called for a substantial upgrade to U.S. C3 capabilities.

United States C3 assets were believed to be incapable of effective performance beyond the initial phases of a nuclear war. A recent report written for Congress on the vulnerability of U.S. C3 assets in a crisis

warns that the U.S. system could very easily be knocked out in the first rounds of a nuclear war. The author of the report argued elsewhere that the "depth of commitment to C3 remains in doubt and the weaknesses of the system could cause a panicky reaction during a crisis".[39] That is, inadequate knowledge of the Soviet attack's parameters or subsequent intra-war strikes in addition to degraded communication systems could influence the national command authorities to retaliate more heavily in hopes of limiting further damage to the United States.

Secretary of Defense Brown stated that PD59 implied a theory of nuclear attrition and promised Soviet leaders that they would be placed in jeopardy by U.S. missiles if a nuclear war continued beyond initial attacks. The focus of U.S. employment strategy would be to attack the military sources of Soviet strategic strength, their strategic nuclear weapons, and, in particular, counterforce weapons and their force control infrastructure rather than urban-industrial targets.[40] In effect, "PD59 proposed a military campaign in the traditional sense, targeting sources of an enemy's ability to fight, not an attempt to cripple him the first day which would likely result in an all-out war".[41]

Unlike the assured destruction school, PD59 authors believed that a nuclear war might be limited and prolonged. While making these ideas known, they were careful to note that it is not the same as saying that a nuclear war will be limited. A number of critics of the countervailing policy have suggested that its supporters have come to believe that a nuclear war can be kept limited and fought to a logical, rational, military/political end in which a victor will emerge.

Although this kind of nuclear engagement rule definition might be sought on the part of some strategists, the Carter Administration stated emphatically that the Administration neither believed a nuclear war would necessarily start as a limited war nor did they believe that it would always remain limited. Critics, such as Beres, charge that PD59 is "founded on the assumption that the Soviets are more likely to be deterred by the threat of limited . . . counterforce reprisals than the threat of overwhelming, total retaliation".[42] He further argues that PD59 and the countervailing policy are clouded by the pervasive doubts of U.S. theorists and government strategists concerning the control of a nuclear conflict. Secretary Brown stated in his Fiscal Year 1981 Annual Report to the Congress that "in adopting and implementing" the countervailing policy, the U.S. had "no more illusions than our predecessors that a nuclear war could be closely and surgically controlled".[43]

Beres's comments in Parameters 1981 brought about a quick reaction from pro-PD59 theorists. Gray, writing in the same journal in reaction to Beres, charged that a number of Beres's criticisms were inaccurate. Gray stated that proponents of PD59 only believe that a nuclear war might be limited and that PD59 offers some possibility for limitation whereas assured destruction policy does not.[44] He also asserted that PD59 proponents do not assume that the Soviets will be restrained in its targeting but that the U.S. should try to provide incentives for the Soviets to restrain their targeting and should these efforts fail, the U.S. should enforce restraints.[45] While the U.S. cannot know whether the Soviets will restrain their targeting, the concept of enforcing

restraint is much more uncertain and might lead to a false sense of optimism in the U.S.'s war-fighting capabilities.

The Beres/Gray debate fails to address an additional element introduced into U.S. strategic theory by PD59. The evolution that Secretary Brown discussed in his unveiling of PD59 in 1980 applies only in the sense that the U.S. had been gradually adding flexible and selective options to its policies and strategies. Whereas the Kennedy and Nixon Administrations both discussed these kinds of war plans and pronounced new policies in support of a flexible SIOP, namely McNamara's 'no-cities' approach and the Nixon Administration's 'limited nuclear options', no administration until President Carter's, radically altered the U.S. view that a nuclear war would be short and massive. The radical departure pronounced by PD59 was that a nuclear war may be limited to military or military related targets and protracted and that the U.S. would require the forces to fight that kind of war. The policy debate should focus not so much on whether the U.S. desires a countervailing policy, as the development of technology has seemingly pushed the U.S. in that direction, but whether and how it should implement that policy. The question the U.S. needs to address is: What combination of nuclear forces and C3 assets are required that can survive and function for perhaps as long as six months?[46] United States nuclear forces in the eyes of countervailing theorists lacked enduring and survivable C3I as well as plans and support infrastructure for post-war reconstitution.[47] These kinds of assets are only necessary once the U.S. accepts the view that a nuclear war may be limited and prolonged.

Secretary Brown publicly announced the countervailing policy at the Naval War College on August 20, 1980. In his speech, Brown stated that the goal of PD59 was to convince the Soviets "that no use of nuclear weapons - on any scale of attack and at any stage of conflict - could lead to victory, however they may define victory".[48] Presidential Directive 59 bridges the gap between a countervalue policy such as assured destruction and a true war-fighting policy. Countervailing policy advocates recognized that the assured destruction policy could only work if both superpowers accepted its tenets. That is, if one superpower perceives that strategic advantages short of decisive nuclear superiority is useful (a highly de-stabilizing condition given the strategic competition between the U.S. and Soviet Union), then the other superpower is obligated to prevent the other from attempting to exploit such an advantage, real or illusiory.

Secondly, assured destruction is not sufficient in itself, as a massive retaliation against countervalue targets may not be appropriate nor will its prospects always be sufficiently credible to deter the full range of action the U.S. seeks to prevent on the part of the Soviets.[49] Countervailing policy continues to maintain the 'ultimate' threat of a massive countervalue attack as a final option while refining U.S. strategies for limited and selected attacks designed to deny military victory. A true war-fighting policy, on the other hand, advocates strategies that seek not only to deny victory to an enemy but would seek the preparations to fight and 'win' a nuclear war. A war-fighting policy accepts nuclear weapons as weapons for the purpose of achieving selected political as well as military goals.

The implications of countervailing policy for a strategic defense are fairly logical. Certain types of missile defenses are acceptable to countervailing policy advocates in that they can be deployed to bolster the deterrence credibility of U.S. nuclear forces and related assets. A counterforce defense of U.S. nuclear forces generally is regarded as consistent with countervailing policy. These defenses could be assigned to augment the survivability of U.S. nuclear forces and thereby enhance their deterrence value. A major concern of the Carter Administration while conducting its policy review was the growing war-fighting capability of the Soviet nuclear arsenal. Soviet doctrine has long emphasized an offensive strategy to include counterforce attacks on U.S. military assests. A potentially effective and politically acceptable role for a U.S. defense, then, could be to thwart a Soviet attack by denying the Soviets their wartime objectives. Hence, in addition to coutervailing policy, the U.S. may seek to integrate a BMD to perform a similar deterrent role as offensive forces. In fact, an effective BMD, namely preferential defenses of key military assets which the Soviets might seek to destroy as part of their wartime objectives, may prove as useful as present plans to deny the Soviets victory through an offensive strategy conducted with counterforce weapons and upgraded C31 systems.

Ballistic missile defenses capable of more advanced defense missions would be regarded as unnecessary and potentially provocative to the Soviets if they threatened to degrade significantly the Soviet's retaliatory capabilities. For example, an area wide countervalue defense of the boost phase type might be regarded by the Soviets as an effort to deploy a victory seeking capability rather than a victory

denial posture and could stimulate an arms race or destabilize the nuclear balance. Countervailing theorists make a critical distinction between preservation of retaliatory forces by deploying counterforce missile defenses and defense populations which threaten to degrade an enemy's retaliatory capability.

In conclusion, countervailing policy seeks the deployment of offensive and possibly defensive weapons that promote the deterrence credibility of U.S. nuclear forces but that do not threaten the stability of the strategic balance. Such force, in accordance with the policy, should provide a survivable counterforce threat to Soviet war-fighting capabilities. The purpose of these deployments would be to pursuade an enemy that the initiation of a nuclear war would be futile at any level and that in the event of a nuclear war, the enemy should back away from more damaging attacks. A U.S. ballistic missile defense could act to enhance U.S. force survivability such that the U.S. could continue to threaten the Soviets with an effective counterforce attack either in a trans-attack or post-attack environment according to countervailing policy.

C. War-Fighting Policy:

A final component of the current U.S. nuclear policy mix is the so-called nuclear war-fighting policy. This policy school has achieved greater prominence as a result of criticisms leveled against Presidential Directive 59 and countervailing policy. A basis of that criticism has been that PD59 did not go far enough in criticizing assured destruction policy and did not adequately address the threats

posed by the Soviet Union to the United States. Although the notion of a policy designed to execute a nuclear war in much the same fashion as a conventionally fought war is not approached lightly, in some sense it is the next most logical step for U.S. nuclear policy. War-fighting policies suggest that the U.S. not only take seriously the possibility of nuclear war, but that the U.S. should prepare to fight and 'prevail' in its event. That is, nuclear war-fighting policy suggests that the U.S. augment a 'victory denial' policy (as emphasized in PD59) with a policy for 'prevailing' with an emphasis on the restoration of deterrence at the lowest level of violence possible.[50]

War-fighting theorists argue that there is less need to be concerned about the perceptions of an enemy who might feel pressure to attack as the enemy becomes inferior and are more concerned with a nation that might think it is superior and attack for these reasons.[51] In a sense, war-fighting theorists emphasize deterrence perceptions about the military influence of particular weapons and strategies rather than perceptions about the stability of the nuclear balance. A war-fighting policy could be implemented by requiring that all weapons be justified on a militarily useful basis. In other words, all nuclear weapons must serve a rational military function. However, Desmond Ball has reported that population targeting, a militarily non-traditional target, has always been an inherent part of our targeting strategy.[52] This kind of attack executed against Soviet urban-industrial recovery assets would result in millions of deaths from prompt collateral damage and radioactive fallout. However, population targeting is no longer 'rational' or necessary in a nuclear war-fighting policy. United States

nuclear delivery systems have become more accurate allowing for a reduction in the size of their nuclear yields while preserving their destructive potential against a specific target. As a result, discriminate targeting of Soviet military forces and installations as well as selected economic assets is considered increasingly possible.

Discrimination is a function of the accuracy of the weapon, its yield, and the hardness of the target. Most targets are not hardened against nuclear blast overpressure and, therefore, a small yield weapon deployed on an accurate system can adequately damage or destroy these kinds of targets. The level of collateral damage to surrounding populations generally decreases as the yield of a weapon is reduced. That is, the radius of damage around the impact point (ground zero) decreases as the yield of a nuclear weapon decreases. Hence, the advent of accurate weapons may allow the U.S. to use nuclear weapons in a fashion that discriminates between a specific military target and population areas. While this discrimination targeting function can be worked out mathematically, it is impossible to assess at what level of collateral damage and dead -- 100,000; 1 million; 2 million -- the Soviets would no longer consider a U.S. attack limited. The goal of discrimination is only valid when limited and selective nuclear strikes are envisioned as large attacks are likely to generate considerable levels of collateral damage. Even in a limited attack scenario, the scale of destruction is so much creater than all other types of warfare currently known that war-fighting theorists must question the value of nuclear weapons for warfare as traditionally envisioned. That is, the scale of destruction and the uncertainties inherent in nuclear warfare

tend to relegate nuclear weapons to the role of deterring nuclear war.

The U.S. does not need to be concerned with maintaining the certainty of punishment prescribed by the assured destruction policy and retained by the countervailing policy according to war-fighting policy theorists. Rather the U.S. needs to be concerned with 'rationalizing' the U.S. deterrent if war-fighting policy is envisioned.[53] Illustrative of the nuclear war-fighting policy's view of deterrence is Leon Weiseltier's characterization that "it is not uncontrolled violence but controlled nuclear violence that the Soviet Union will really fear".[54]

War-fighting policies seek to make nuclear weapons useful tools to conduct a war in the event of a nuclear war. The Reagan Administration has given war-fighting policies their most serious attention. Secretary of Defense Weinberger, the Administration's focal point for war-fighting advocacy, has advanced the notion that the U.S. can 'prevail' in a nuclear war fought over a protracted period of time.[55] Weinberger suggested that the U.S. emphasize the decapitation or destruction of Soviet military and political authority in a counterforce/countermeasures mode.[56] A countermeasures attack could encompass the destruction of Soviet key command and control installations as well as selected leadership bunkers. The focus of a 'prevailing' war-fighting policy would be to sever the Soviet Union's ability to prosecute a nuclear war while also avoiding attacks on thousands of Soviet nuclear weapons thereby potentially reducing the level of collateral damage. However, the destruction of the Soviet Union's leadership or critical lines of communication may only make a negotiated end to the war more difficult to achieve. While

countervailing policy has focused on threatening the Soviet leadership and theri strategic forces directly, war-fighting theory suggests that the destruction of key links in the Soviet war-fighting capability to include the leadership is essential. While intra-war deterrence ultimately is the objective of both countervailing and war-fighting policy, neither has addressed the implications of destroying the Soviet national command authority for deterrence. For example, once lines of communication have been severed, Soviet launch posts and submarines may still have the capability to individually release their weapons. Negotiations in this environment are likely to prove ineffective.

Although both Carter's PD59 and Weinberger emphasize counterforce capabilities, the war-fighting school suggests that the U.S. respond to a Soviet attack by seeking an end to the conflict on favorable terms. In effect, Weinberger and war-fighting theorists posit that the U.S. be concerned with 'winning' a nuclear war. James Fallows, in summarizing the war-fighting policy, states that "it argues that nuclear warfare should be regarded not as material anninilation but rather as an exchange from which one side might emerge with significantly less damage than the other."[57]

A critical assumption in the war-fighting theory is that a nuclear war can remain limited and can be ended before escalation to countervalue attacks has begun. In effect, war-fighting policy expands the role of nuclear weapons to the deterrence of war at all levels in a fashion similar to the countervailing policy. The major difference between the two policies is that the war-fighting theory places emphasis on 'winning' the war whereas the countervailing policy seeks an end to

the war which prevents a Soviet victory. If nuclear war can be limited, as war-fighting theorists claim it might be, it must be fought rationally and efforts must be made to keep destruction at the lowest possible level. The implementation of a war-fighting policy would require the deployment of weapons that provide a full range of war-fighting options, in particular, hard target kill capable forces such as the MX ICBM and Trident II SLBM. A part of such a rational war-fighting posture, in accordance with the policy, would be a war-survival capability. That is, "the concept of war-winning requires not only effective offensive counterforce capabilities, but effective defenses in order to maintain military dominance after war-termination and effect post-war recovery."[58]

A true nuclear war-fighting policy is likely to require the full integration of ballistic missile defenses as an effective means of limiting damage to U.S. nuclear forces and war prosecuting and recovery capabilities to include some population centers. The relationship of offense and defense is such that defences might be needed to reduce the threat of unacceptable damage. "Vulnerability to unacceptable damage is not desirable for political and military stability" in a war-fighting policy.[59] The war-fighting policy calls for a true damage limitation strategy. Both offensive and defensive forces would be expected to contribute to the success of such a strategy. However, the feasibility of a truly effective damage limiting area defense is likely to be too low to convince war-fighting theorists that they can depend on defenses to limit damage to the United States. As a result, the size of a war-fighting strike against the Soviet strategic assets may be increased

in order to limit damage by initially destroying as many Soviet forces and assets as possible. Larger initial strikes are likely to cause millions of Soviet deaths and casualties thereby contradicting the desire to keep the war limited. As alluded to above, the Soviets have argued at length that limited nuclear war is not possible and that more massive nuclear attacks are likely to follow any limited U.S. strike. Given their proclivity for this view of nuclear war and the collateral damage that would result from a U.S. limited attack on Soviet forces, the Soviets are likely to respond with a massive strike on the United States. The U.S. could suffer millions of deaths and casualities in return even if it was defended by a missile defense capable of intercepting 50 percent of the attacking reentry vehicles.

Ballistic missile defense from counterforce to countervalue are compatible with a war-fighting policy. Both a silo defense and mid-course defense designed specifically to enhance the survivability of U.S. counterforce systems and national command authorities would be obvious choices. A multi-tiered countervalue defense also could serve to complement a war-fighting policy as a means of limiting the level of damage to U.S. cities and industrial centers thereby enhancing the chances of a quicker post-war recovery.

II: IMPLICATIONS OF A U.S. STRATEGIC DEFENSE

The strategic policies, outlined above, have a common background and set of principles. This background is characterized as offensively based deterrence which has played the dominant role in U.S. strategic

nuclear thought since 1945. Although the U.S. flirted with a strategic defense in the 1960s, offensive nuclear weapons have always been relied upon to maintain U.S. strategic security. With this in mind, Secretary of Defense Weinberger has provided an appropriate perspective of why the Reagan Administration's strategic defense initiative was started and where it might lead:

> "When the Reagan Administration entered office in 1981, a lengthy debate could have been held on the question: Which was in worse shape: our military hardware or our strategic concepts? . . . Indeed, most of the concepts that shape our thinking about what forces we need and how they would be used were formulated in the 1950s and early 1960s. This administration's boldest departure from the dogma of the past is the president's strategic defense initiative, a radical rejection of acquiescence in mutual assured destruction."[60]

The rejection of the past described by Weinberger is pointedly concerned with offensively based deterrence. Whereas each successive president from Eisenhower to Carter had been sure that offensive deterrence could always prevent a nuclear war, President Reagan apparently is not. The U.S. held a wide margin of nuclear superiority during the 1950s and 1960s which eroded during the Nixon to Carter years. The U.S. dealt with this erosion through a multifaceted effort to restrain Soviet strategic efforts while expanding the capacity and mission objectives of U.S. nuclear forces. That is, the U.S. attempted to enhance deterrence while accepting a less advantageous position than it had been used to. The U.S. conducted these efforts by revising its

nuclear policy, upgrading its nuclear force, and promoting arms control. The U.S. has increasingly demanded ever more sophisticated and complex missions from its nuclear force. It has also given its forces a greater capability to perform these missions. Yet, U.S. forces rarely have been capable of meeting the most demanding objectives required by U.S. nuclear policy. For example, the U.S. developed policies in the 1970s that call for an ability to respond to a Soviet attack with selective and discriminate attacks while failing to procure weapons of this capability. These efforts -- from National Security Decision Memorandum 242 in 1974 through Presidential Directive 59 in 1980 -- have attempted to squeeze the greatest deterrence value out of an early 1970s era strategic arsenal. The U.S. also sought to hold the Soviet buildup within specified limits by promoting arms control accords. Overall, these efforts have come under increasing criticism for being unable to cure the ills of a 'weakening' strategic balance.

A point often forgotten by advocates of offensively based deterrence is that the U.S. did enjoy a period of nuclear superiority. Having failed to adjust from that position to one of rough equality or Soviet advantage in a militarily rational fashion, according to the Reagan Administration, the U.S. now faces a decision between building vast new offensive weapons to catch up with the Soviets or seeking a new means to assure the deterrence of Soviet aggression. This represents the essential platform upon which the Reagan Administration criticized U.S. nuclear policy and forces in 1980.

The Reagan Administration has argued that the U.S. should seek a defense dominated deterrence posture and policy. The central question

in this context, however, is what are the implications for U.S. strategic nuclear policy? A principal element of U.S. nuclear employment policy has been that an attack on the U.S. would result in swift and certain retaliation. The composition of the retaliation in the SIOP has varied from 'massive' countervalue attacks on Soviet cities to selective counterforce strikes on Soviet strategic weapons. Retaliation has been considered essential to a credible policy of deterrence.

In a defense dominated balance, a policy for retaliation may no longer play as critical a role. In effect, the need for retaliation will have a diminished value whereas a policy for retaliation is considered essential to deter an attack in an undefended balance. The Soviets are believed to be deterred under current strategic conditions because the United States possesses a capability to retaliate and has stated its intention to do so in the event of a Soviet attack. In a defensive balance, the logic of deterrence is as follows: the Soviets might be deterred because of the potential failure of an attack rather than affecting a certain reprisal which could cause a war to escalate and result in severe levels of damage to both superpowers.

The revisions to U.S. strategic nuclear policy as a result of a defense deployment are unlikely to preclude the maintenance of some form of an offensive threat. Yet, in a world with both offensive and defensive forces, U.S. selective limited attack options become increasingly less viable. For example, a Soviet preferential defense, which conforms with Soviet strategic doctrine, might degrade a limited U.S. strike on Soviet C3 installations as to render such an attack

ineffective. As such, the U.S. would need to either attack Soviet defense (defense suppression), concurrently with its offensive attack or increase the size and sophistication of its countermeasures attack. Both avenues are likely to fail to meet the overall mission objectives, a 'critical' level of countermeasure damage, while also increasing the potential collateral damage to surrounding areas. The result might be to impress the Soviets that the U.S. had not conducted a limited strike as intended, hence failing to transmit a message for restraint.

The scenario above is frought with speculation but points up some of the policy problems that could emerge in a defense dominated nuclear world. It may be that the Reagan Administration already has recognized these inherent policy problems. One indication is Reagan's insistence that the transition to a defensive balance be accompanied by a reduction in offensive nuclear forces. Although some Administration officials have tried to portray Reagan's proposal as 'Summit talk', Reagan has emphasized the idea of a reduction in the sizes of offensive forces as well as a scheme on 'technology sharing'.[61] Both ideas are often ignored as mere political posturing -- efforts to gain support in Congress and with the public for the SDI. However, ideas such as these may provide a possible avenue for implementing a stable transition phase. The success of these avenues may be tied to a U.S. and Soviet arms agreement which could prove more difficult to accomplish as the U.S. reaches a defense deployment stage. Given the possible pressures on U.S. nuclear policy, it becomes interesting to speculate on what a U.S. offensive nuclear policy might look like in a defense dominated world.

One key to answering this question centers on the type of defense deployed and its level of effectiveness. While it is too early to know what the design of a U.S. strategic defense might look like, it is possible to model effectiveness. Table 4. illustrates the impact of differing levels of effectiveness on the penetration rates for an enemy's reentry vehicles.

For purposes of discussion, it may be assumed that a U.S. defense by the year 2000 may acquire a very high level of effectiveness. The number of reentry vehicles that would penetrate a U.S. missile defense capable of 80 percent or 90 percent kill rates -- at each of four tiers -- would be relatively small given the number of RVs in an initial attack. Under these conditions, the emphasis might shift from calculations of the level of prompt damage the superpowers could unleash against each other to estimates of the number of dead prevented. In this context, the U.S. may have a decreased need to retain a sizable counterforce arsenal as well as associated countermeasures to assure that its forces can penetrate. As such, these defenses could be relied upon to deter a Soviet attack on the U.S or its allies. However, the U.S may choose to retain counterforce weapons should it opt for a true war-fighting posture while also deploying a defense.

The issue of defense effectiveness is confused as there are several possible ways to measure the effectiveness of a defense. Measures of effectiveness can include RV penetration levels (leakage), numbers of

Table 4. Warhead Penetration Levels.

Number of Warheads in Attack	Level of defense effectiveness*										
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
1,000	1000	656	410	240	130	63	26	8	2	0	0
5,000	5000	3280	2048	1200	648	312	128	40	8	1	0
10,000	10000	6561	4096	2401	1296	625	256	81	16	1	0

*The numbers of warheads able to penetrate the defense is calculated according to the effectiveness of a four-tiered ballistic missile defense. For example, each of four defense layers might destroy 10 percent of the RVs in an attack thereby reducing an attack of 1,000 RVs to 656.

targets killed, and the number of fatalities resulting from an attack.

While it is well understood that any nuclear war is likely to cause millions of deaths and casualties, the impact of a missile defense on the numbers of deaths and casualties has not been fully addressed. The National Academy of Science has estimated that one percent of either superpowers' nuclear arsenal targeted against each other's cities would cause between 35 and 55 million dead and an additional tens of millions would die from later events resulting from the attack.[62] If these percentages and numbers are accurate -- calculations of this nature are highly subject to debate -- roughly 100 Soviet reentry vehicles exploded over U.S. cities would be enough to cause this level of devastation

(given that 100 RVs equals one percent of the roughly 10,000 reentry vehicles in each superpowers' nuclear aresenal).[63]

Senator William Proxmire has pointed out that currently it is inconceivable that a U.S. missile defense could prevent anything like 99 percent of an enemy's warheads from penetrating that defense.[64] Hence, while missile defenses may intercept some percentage of an enemy's attacking warheads, a less than perfect countervalue defense appears to benefit the U.S. very little in the event of a massive nuclear attack. However, U.S. strategic analysts have feared a Soviet attack not only on a massive scale, but on a limited scale as well, particularly against U.S. ICBMs. The more limited numbers of reentry vehicles involved in such an attack may in turn be more manageable for a U.S. missile defense. Secretary of Defense Schlesinger estimated that a Soviet counterforce attack on U.S. strategic nuclear delivery systems would cause 800,000 fatalities and an additional 1.5 million casualties from radiation sickness.[65] These numbers were criticized as being far too optimistic and a new study by the Department of Defense estimated 3.4 million prompt deaths in the least devastating attack on U.S. ICBM silos.[66] A current study has been completed and is displayed in Table 5. While the modeling is problematical, the numbers of casualties are staggering in any scenario. The attacks modeled in Table 5. are based on 100 megatons reaching their designated targets. A U.S. missile defense capable of destroying roughly 96 percent of Soviet reentry vehicles in a limited attack on U.S. strategic delivery systems (often estimated around 3000 warheads) still would not prevent millions of deaths.

Table 5. Estimated Deaths and Total Casualties From "100 Megaton" Attacks.

Model	Deaths (in millions)	Total Casualties
Attack:		
Worst-case	25-66	36-71
City-centers	14-22	32-51
Mil-industrial	11-29	23-35
Strategic-nuclear	3-11	10-16

Source: William Daugherty, Barbara Levi, and Frank Von Hippel, "The Consequences of 'Limited' Nuclear Attacks on the United States," International Security, 10 (Spring 1986): 5.

That is, four percent of 3,000 Soviet reentry vehicles (120 warheads) could cause between 10 and 16 million total casualties to the U.S. population base according to this modeling.[67] It would be unthinkable for the U.S. to abandon its offensive deterrence policy in favor of defenses in the face of these estimates.

The U.S may be capable of a meaningful damage limitation strategy under certain circumstances - presupposing that the Soviet Union has not deployed effective countermeasures to a U.S. BMD and a more capable counterforce arsenal in its own effort to develop a war-fighting and damage limitation force. However, the U.S. can only implement a meaningful damage limiting strategy today by incorporating a first

strike into its nuclear strategy. In the event that the Soviet Union has missile defenses, the ability of U.S. offensive forces to limit damage to the U.S. would be correspondingly reduced. What this suggests is that a complex calculas exists for offensive and defensive force interactions.

Another critical factor impinging on a U.S. decision of whether or not to maintain a strictly offensive deterrent policy is the possible nature of a defense transition period. The U.S. will be faced with a number of issues by the early 1990s when the SDI has achieved a level of development, with regard to some defense technologies, from which a deployment decision could be made. Depending on the level of development, the U.S. is likely to go ahead with some kind of ballistic missile defense. Once the decisions on the system structure and deployment arena are made, the U.S. will need to consider an important issue -- stability. That is, can the U.S. assure that Soviet confidence in victory will continue to be denied by posing adequate risks in the form of defense denial or the threat of offensive retaliation during a transition phase?

The issue of stability actually encompasses three separate problems which the U.S will be concerned with during a transition period: strategic stability, crisis stability, and arms race stability. The stability of the nuclear balance is not a new issue as strategic theorists have been concerned with stability since the late 1940s.

Strategic stability has been defined as the condition where the superpowers calculate that the risks outweigh the potential gains from initiating a nuclear war. Strategic stabiltiy exists, in practice, when

the superpowers are secure in the knowledge that each has a second strike capability.[68] A critical factor in securing strategic stability is that both are confident that their second strike retaliatory forces are capable of threatening unacceptable damage to the other. Michael Howard, an eminent historian of the nuclear age, has added that stability is a result of a subtle psychological relationship between forces rather than gross numbers. In any event, the U.S will need to retain an invulnerable retaliatory force in order to maintain the threat of assured destruction and preclude a shift in Soviet calculations that looks favorably about the possible risks and gains of a nuclear war. Opponents of defense charge that defense deployments will destabilize the strategic balance, whereas proponents claim that it may help preserve strategic stability by increasing the survivability of U.S. retaliatory forces. In addition, defense proponents seek to shift the onus of stability to the defense such that stability is assured when the superpowers are secure in the knowledge that each can defend against a nuclear attack.

Crisis stability reasonably could be said to exist "when neither superpower has reason to fear a preemptive strike during a crisis".[69] However, it must be said that crisis stability ultimately rests on perceptions about the vulnerability of one's nuclear forces. When the issue of Minuteman vulnerability began to appear in the mid-1970s as a result of Soviet ICBM accuracy improvements, the issue of crisis stability reappeared. The issue of crisis stability had been addressed subsequent to the 1962 Cuban missile crisis and in conjunction with arguments against the ABM in the late 1960s. Sigal provides an

insightful description of the conditions under which crisis stability can be questioned.

> "In a crisis in which nuclear war seems imminent and unavoidable, the side worried about its own vulnerability might see some advantage in preemptive attack. If either side sees itself in such a predicament, then both sides are less secure for fear of preemption. Moreover, once nuclear war seems imminent and unavoidable - and only then - each side has some incentive to shoot first even if it can not completely disarm the other side, in order to limit the damage it will suffer when the inevitable happens."[70]

Gray and Payne have argued that it will be necessary to protect against instabilities during the transition phase when it will be particulary easy to ignore U.S. offensive forces.[71] As the U.S. land-based deterrent has become increasingly vulnerable to a Soviet first strike, the other legs of the TRIAD will require upgrades and improvements to undertake wartime missions for which the ICBM force is currently responsible. However, the Scowcroft Commission concluded that U.S nuclear forces are not vulnerable to a Soviet first strike that would leave the U.S. unable to respond. The Commission concluded a study on the force vulnerability issue by stating that the Soviet Union is unable to disarm the U.S. in a first strike and that most U.S. SSBNs and some strategic bombers and ICBMs would survive an attack and would continue to pose an adequate assured destruction threat. The Commission also concluded that this situation would not change appreciably for most of the 1980s and 1990s. While it may be appealing to seek an offensive

arms reduction agreement during the early part of a defense transition phase as President Reagan has suggested, Gray and Payne argue that it will be particularly important to maintain an effective offensive deterrent while integrating a missile defense in order to preclude a Soviet strike during a crisis. However, Gray and Payne ignore the potentially destabilizing influence that a U.S. defense might have should the U.S. also maintain and improve its counterforce arsenal as currently planned.

The final category concerns arms race stability. "Arms race stability prevails when neither side is concerned that its enemy is trying to build weapons that endanger either strategic or crisis stability."[72] A particularly effective argument against the ABM defense in the 1960s, as alluded to in Chapter 1, was the potential for accelerating the arms race and expanding it to both offensive and defensive arenas. The Soviet Union has charged that the U.S. strategic defense initiative program has the potential to instigate a more dangerous and broader arms race both on earth and in space. In addition, the Soviet Union has stated that among the possible responses it could undertake to the SDI is an increase in offensive systems, penetration aids for warheads, and a strategic missile defense of its own.[73] The stability of a defense transition might be hampered as offensive arsenals expand in size and capability if the arms race is not constrained or a more vigorous race commences. As a result, the effectiveness of an initial U.S. missile defense might be degraded, especially a more limited land-based counterforce defense, thereby weakening the overall stability of the transition period.

United States concern for 'stability' has often stymied its initiating steps to preserve its security. Stephen Rosen has explored the issue of stability and its impact on U.S. strategic nuclear doctrine. He concludes that there is evidence that nuclear instabilities, of the kind that would be created by certain kinds of weapons systems, have existed and have not led inexorably to war.[74] For example, Rosen concludes that political factors and not weapons produced a peace after World War II and it is political factors that make a war possible now.[75] Hence, the propensity to observe every new weapon as either destabilizing or stabilizing may over emphasize the impact they actually have on the nuclear balance of power. However, the perceptions of 'stability' created as a result of certain weapons systems to include a U.S. defense do influence the political factors that make a war possible.

Ultimately, the U.S. may shift in favor of some kind of defensive posture to deter a nuclear war, assuming that the SDI provides the technological base to build an effective defense. Under these conditions and dependent on the mission objectives prescribed for the defense, the U.S. may begin to downplay its offensive deterrent. Offensive nuclear policy - assured destruction, countervailing, and war-fighting policies - could play an increasingly less important role in U.S. deterrence policy. However, a myriad of new issues will develop in the wake of a defense deployment. Will a strategic defensive policy encompass a true damaged limitation strategy to include civil defense and air defense? How will the U.S. compose its nuclear arsenal during the transition and once a defense is fully deployed? Finally, does the

shift to the defense require a new arms control effort to 'protect' the transition from a profusion of offensive weapons and can a new arms control regime emerge?

While it is impossible to estimate the level of effectiveness that a strategic defense could achieve there are a number of other strategic and political implications of deploying a system that need to be addressed. One of these is the potential cost of a strategic defense system and its cost to other strategic programs.

The strategic defense initiative program was projected to cost 25 billion dollars over the first five years of its research life. While the actual budget expenditures for research have been scaled back by the Congress, the deployment and maintenance costs of a multi-tiered space-based ballistic missile defense could be many times greater than the research phase. Former Secretary of Defense Harold Brown has estimated that it could cost 100 billion dollars just to place the defense systems -- weapons, sensors, stations -- into space. In addition, Brown estimates the continued research, development, and maintenance costs of a deployed system could require an additional 100 to 200 billion dollars. General James Abrahamson, Director of the SDI program, has admitted that these estimates are probably accurate given the present costs of satellites, launch expenses, and maintenance estimates. Abrahamson has stated that a dramatic reduction in the cost of all associated manufacturing and deployment technologies will have to be achieved in order to justify a defense beyond the initial research phase.

The Council on Economic Priorities issued a report in 1985 critical

of the strategic defense initiative. The Council concluded that while the costs of the defense systems envisioned by President Reagan are uncertain, because it is currently only a research program, a strategic defense program could cost between 400 and 800 billion dollars.[76] The Department of Defense has not yet projected the costs of different defense systems due, in part, to the ill defined nature of a possible deployable system. The very lack of a defense objective concerns most defense analysts as it leaves the total costs up in the air. For instance, the cost of deploying a space-based defense could be considerable. The U.S. does not currently have a space launch system capable of placing in orbit millions of pounds of weaponry and support infrastructure. The development of a launch vehicle and the cost of its operations could mount into the billions of dollars as demonstrated by the relatively small space shuttle program.

The strategic defense concept poses vast problems for nuclear doctrine, strategy, technological development, and battle management (namely C3) to include areas such as computer programming. The cost of resolving each of these problems is truly incalculable at this time. However, without a defined system or even a technolgical focus the costs could quickly grow. For example, the SDIO has contracted for overall system designs over the past three years predicated on a centralized battle management concept. A recent report by the Eastport Panel (the SDIO's computer software study panel), suggested that a de-centralized battle management program may be more effective.[77] However, the R & D and procurement costs of redundant systems are likely to increase in this context. Congress has made it clear that it is unwilling to simply

throw money into the strategic defense program and until a system design is decided upon, throwing money at widely different technologies makes little strategic or economic sense. The space shuttle is too expensive to operate and to meet the SDI requirements projected at 4.4 million pounds of space armament each year would require hundreds of shuttle flights. For example, at present cost of 3,000 dollars a pound to replace material in orbit, the U.S. would spend 13.2 billion dollars a year just launching defense-related equipment. The SDIO already has proposed a new unmanned reusable space cargo system to support a U.S. ballistic missile defense.

A related issue is the cost of strategic defense to other military programs. While the SDIO continues to research missile defenses, the U.S. has begun a multi-faceted modernization program for its strategic offensive forces. The costs of the MX and Midgetman ICBM programs, the B1 and Stealth bombers, the 600 ship Navy and Trident programs, as well as conventional force modernization are just beginning to be felt. Some of these programs will only begin full funding in five to ten years at a point when a strategic defense might be ready for initial deployment. Which other programs might be cut in order to continue a strategic defense program is likely to be the subject of intense political debate. These decisions will depend on the level of effectiveness and hence the contribution to U.S. deterrence capabilities that a strategic defense will possess. While strategic defense advocates, such as Daniel Graham, have argued that a deployed defense will allow the U.S. to dismantle offensive forces and thereby reduce the costs of some strategic programs, a conservative estimate would suggest that the U.S. will not

dismantle a proven deterrent too quickly. That is, the U.S. is unlikely to dismantle offensive nuclear forces until it is confident that it can handle Soviet defense countermeasures and has proven the value of a strategic defense to U.S. security.

The cost of continuing with SDI related research eventually will be felt on conventional arms. The U.S. has begun undertaking a massive re-equipping of its conventional forces. In addition, the U.S. has tied its security interests more closely to the Middle East, Far East, and Central America in the past few years. Shifting dollars from conventional arms purchases, training, and foreign bases in order to fund the SDI program may begin to hurt the U.S.'s ability to meet its conventional security requirements. However, until a decision to deploy a ballistic missile defense is made, cutbacks in defense dollars are unlikely to be leveled solely on the SDI or conventional arms programs.

It may be technologically and economically feasible for the U.S. to go forward with some kind of counterforce defense. While this type of defense may not buy the U.S. a defense capability of the kind envisioned by President Reagan, it is not burdened by insurmountable technological uncertainties. Former Secretary of Defense Brown recently concluded that a near term defense appears technically cost-effective for some kinds of retaliatory forces.[78] The Carter Administration's Pentagon under Brown had been actively researching the concept of a point defense for the MX ICBM.

In addition to the possible costs of deploying a missile defense is the issue of addressing U.S. air defense gaps as the U.S. is vulnerable to bomber and cruise missile attacks. As alluded to earlier, an

effective means of circumscribing a ballistic missile defense might include advanced stealth bombers, cruise missiles and depressed trajectory SLBMs. The U.S. may be faced with a requirement for effective national air defenses to combat these threats as a result of deploying a ballistic missile defense. Another related concern is the role of civil defenses in a defense dominated world. In order to effect a true national defense, the U.S. might have to reassess its civil defenses and begin a comprehensive national program. The costs of these programs are as yet completely unknown. However, the U.S. does not now have a national air defense system or civil defense program of the kind required by a true strategic defense program and therefore the costs of these related programs are likely to reach billions of dollars.

While the SDI was originally billed as a non-nuclear solution to a nuclear problem, SDIO program managers have begun to shift a considerable amount of dollars and research time to the application of nuclear power components which in turn raise a number of environmental questions. The x-ray pumped laser proposal, designed by Edward Teller, would rely on a small nuclear explosion to generate its kill mechanisms. Deployment of thousands of small nuclear warheads in addition to those already deployed either on submarines, ships, or on land is likely to increase the chances of a nuclear accident. The U.S. has begun to explore small nuclear reactors to power a space-based battle station and sensors. The U.S. had explored their use in the early 1970s but abandoned the program when it decided solar power was cheaper and less dangerous. However, a principal concern of SDIO planners is system vulnerability. Solar panels would be highly susceptible to damage while

a small nuclear reactor may be more resilient. Yet, Congress has raised the issue of possible hazards in using a nuclear reactor. The scattering of radioactive debris from a Soviet satellite's nuclear reactor in 1978 over Canada has raised fears that a similar event would be more likely if the U.S. deployed hundreds of such reactors to power its space defense. Congressional inquiry also has stimulated concern that a launch disaster -- similar to the Shuttle Challenger explosion -- if loaded with a nuclear powered defense component could contaminate large areas of Florida and harm hundreds of people. The Department of Defense has stated that all launches would have the reactors in a 'cold' state and only start them after deployment in space and that they would be placed in high orbits to prevent a similiar accident as that of the Soviet satellite. However, nuclear industry scientists agree that considerable effort is required to ensure against an accident that could poison the atmosphere or land around launch sites. In addition, concern has been generated by the SDI program's focus on placing hundreds of defense platforms in space and around the earth. While the less dense 'air' of space is advantageous for the transmission of laser beams and other kill mechanisms, it also is susceptible to erosion and contamination more easily than the thick 'air' within the earth's atmosphere. Exhaust gases and tons of space junk from these platforms could damage the atmosphere, in turn allowing more damaging cosmic radiation to filter down through the atmosphere.79

The promise of defenses against the nuclear threat is tremendously appealing. However, offensive nuclear forces currently maintain a preponderant advantage over defenses. United States deterrence policy

has recognized this fact and has attempted to engender Soviet appreciation of the nuclear balance of terror as well as the U.S. deterrent capability. While the Soviets clearly appreciate the nuclear threat, demonstrated by their offensive and defensive programs, they do not necessarily accept U.S. deterrence theory and have repeatedly rejected a number of U.S. deterrence theory revisions. For example, the U.S. took the initiative to propose a ban on ABMs in 1968 and was initially rebuffed by the Soviets who have always considered defenses an equally important component of their strategic doctrine. The Soviets eventually signed the ABM Treaty, in part, to preclude the deployment of a more capable ABM defense by the United States. In the event that strategic defenses against ballistic missiles prove effective, the U.S. may be confronted with altering the basis of its current nuclear policies. However, the shape and extent of changes to these policies is dependent on a number of factors including the level of effectiveness of a defense, the state of the offensive nuclear balance, Soviet efforts to counter a U.S. defense, and the costs and implications for other U.S. strategic programs.

Endnotes Chapter 3

[1]Walter A. McDougall, "How Not to Think About Space Lasers," National Review, 35 (May 13, 1983): 554.

[2]Harold Brown, "The Strategic Defense Initiative: Defensive Systems and the Strategic Debate," Survival, 27 (March/April 1985): 55.

[3]Ibid.

[4]Strobe Talbott, "Holier-Than-Thou on Star Wars," Time, (July 1, 1985): 26.

[5]Gerard Smith, former U.S. negotiator for the ABM Treaty, has argued that strategic defenses make no more sense today than in the early 1970s. He also has argued that defenses can only make the nuclear balance less stable and thereby make deterrence less assured.

[6]The issue of bombers and cruise missiles will be addressed more closely in Chapter 4. Refer to pages 24 - 26 in Chapter 4.

[7]Adam M. Garfinkle, "The Politics of Space Defense," Orbis, 28 (Summer 1984): 247.

[8]Ibid.

[9]The Harmon Committee, an interservice ad hoc committee led by U.S. Air Force lt General H. R. Harmon, was established to review U.S. nuclear war plans and concluded that they were inadequate to destroying Soviet capabilities to wage war. These conclusions, in turn, led to a rethinking of U.S. strategic targeting. The U.S. added targets such as airfields and other military installations to its war plans. As a result, the number of weapons in the U.S. arsenal grew and the number to be used in a nuclear war also greatly increased. See Peter Pringle and William Arkin, SIOP, (W. W. Norton & Co. New York, NY, 1983): 61 - 63.

[10]Richelson, Jeffrey T., "Population Targeting and U.S. Strategic Doctrine," The Journal of Strategic Studies, 8 (March 1985): 10.

[11]The Eisenhower Administration created the Joint Strategic Target Planning Staff, made up of representatives from each of the military services, and charged it with establishing a target list for the single integrated operational plan (SIOP). Prior to the organization of this staff, the Navy and the Air Force had independently targeted between 200 and 300 similar Soviet targets. The newly created planning process helped eliminate duplication and allocate weapons to target more effectively. However, the problem of 'overkill' - too many weapons and weapons disproportionate in size placed on a target - remained unresolved as the competition for targets between the services generated a demand for more weapons. Pringle and Arkin, SIOP, 103 - 107.

[12]Ibid., 108.

[13]See pages 22 to 24 in Chapter 1 for a review of the initial efforts by McNamara to develop a damage limiting strategy for the United States.

[14]See Senate Armed Services Committee and Senate Appropriations Committee, Military Procurement Authorization, Fiscal Year 1966, p 43. for a statement of the strategic objectives of U.S. nuclear forces: 1. to deter a nuclear attack and 2. to limit damage on U.S. population and industry.

[15]See both Jeffrey T. Richelson "Population Targeting and U.S. Strategic Doctrine," The Journal of Strategic Studies, 8 (March 1985): 5 - 21, and Thomas Powers "Choosing A Strategy for World War III," Atlantic, 250 (November 1982): 82 - 110 for a more detailed discussion of the development of attack options in the SIOP and their impact on U.S. strategic nuclear policy.

[16]Richelson, "Population Targeting and U.S. Strategic Doctrin," 5 - 21.

[17]Powers, "Choosing A Strategy for World War III," 94.

[18]Statement by Secretary of Defense Robert S. McNamara before the House Armed Services Committee on the Fiscal Year 1966-70 Defense Program and 1966 Defense budget, 16 February 1965, p 39.

[19]Robert Jervis, "MAD is the best possible deterrence," Bulletin of Atomic Scientists, 41 (March 1985): 44.

[20]U.S. Poseidon and Trident submarines carry Poseidon/C-3 and Trident/C-4 SLBMs each capable of carrying between eight and fourteen warheads depending on the number of penaids deployed on the missile. United States Poseidon/C-3 SLBMs average 10 warheads apiece while Trident/C-4 SLBMs average 8 warheads. "U.S.-Soviet Nuclear Arms: 1985," The Defense Monitor, 14 (1985): 5.

[21]Pringle and Arkin, SIOP, 172.

[22]Louis Rene Beres, "Presidential Directive 59: Two Views, A Critical Assessment," Paramters, 11 (March 1981): 26.

[23]Fred S. Hoffman, "The SDI in U.S. Nuclear Strategy," International Security, 10 (Summer 1985): 17.

[24]Ibid.

[25]Desmond Ball, Targeting for Strategic Deterrence, Adelphi Papers #185, (London, England: The International Institute for Strategic Studies, Summer 1983), 19.

[26]Ibid.

[27]Ibid., 1.

[28]Powers, "Choosing a Strategy for World War III," 106.

[29]Ibid., 95.

[30]See Soviet Military Power 1981, as well as the same publication issued March 1983, April 1984, April 1985, and March 1986 (Washington, D.C.: U.S. Government Printing Office); Soviet Strategic Defense Programs, (Washington, D.C.: U.S. Government Printing Office, October 1985); and The Military Balance: 1985-1986, (International Institute for Strategic Studies, London: IISS, 1985) for a detailed overview of the Soviet strategic defense efforts.

[31]Colin S. Gray, Panel discussion with Colin S. Gray, Amb. Seymour Weiss, James T. Hackett, and William R. VanCleave at Heritage Foundation, March, 1985.

[32]Powers, "Choosing a Strategy for World War III," 95.

[33]Ibid., 96.

[34]Ball, Targeting for Strategic Deterrence, 22.

[35]Powers, "Choosing a Strategy for World War III," 95.

[36]Ibid. 96.

[37]Tim Carrington, "The Ultimate Secret: A Pentagon Report its Author Can't See," Wall Street Journal, February, 18, 1986, 1.

[38]See Desmond Ball Targeting for Strategic Deterrence, Adelphi Papers #185, (London, England: The International Institute for Strategic Studies, Summer 1983), pages 19 - 20 for a review of the development of the nuclear weapons employment policy (NUWEP).

[39]Powers, "Choosing a Strategy for World War III," 96.

[40]Ibid., 104.

[41]Ibid.

[42]Beres, "Presidential Directive 59: Two Views, A Critical Assessment," 23.

[43]Harold Brown, Department of Defense Annual Report for FY 1981, (Washington, D.C.: U.S. Government Printing Offcie, 1980), 66.

[44]Colin S. Gray, "Presidential Directive 59: Two Views, Flawed But Useful," Parameters, 11 (march 1981): 30.

[45]Ibid.

[46]Ibid.

[47]Ibid.

[48]Powers, "Choosing a Strategy for World War III," 108.

[49]Garfinkle, "The Politics of Space Defense," Orbis, 28 (Summer 1984): 250.

[50]Ibid., 251.

[51]Ibid., 252.

[52]Desmond Ball, Targeting for Strategic Deterrence, Adelphi Papers #195 (London, England: The International Institute for Strategic Studies, 1983): 19.

[53]Garfinkle, "The Politics of Space Defense," 252.

[54]Leon Wieseltier, "When Deterrence Fails," Foreign Affairs, 63 (Spring 1985): 835.

[55]Ibid.

[56]Ibid., 838.

[57]James Fallows, "Reagan's MX Surprise," Atlantic, 248 (December 1981): 8.

[58]Leon Goure, William G. Hyland, and Colin S. Gray, The emerging Strategic Environment: Implications for Ballistic Missile Defense. (Cambridge, MA: Institute for Foreign Policy Analysis, Inc., 1979), 6.

[59]Ibid., 19.

[60]Caspar W. Weinberger, "What is our Defense Strategy?," Defense 85, (December 1985): 2.

[61]See "Excerpts From Reagan's Interview With Reporters From New Agencies," New York Times, November, 7, 1985, p. 6, and "Pre-Summit Confusion Persists," Philadelphia Inquirer, November, 10, 1985.

[62]Senator William Proxmire, Congressional Record, 99th Congress, 2nd session, May 5, 1986, 132.

[63]The numbers of casualties are dependent on certain known-quality constants:

- Demographic distribution of the population
- Topographies of the local region under attack
- Prevailing winds, and
- Availability of shelters.

Additionally, there are a number of uncontrollable variables:

- Timing of an attack
- Magnitude

- Targets (counterforce - countervalue)
- Type of burst (air or surface)
- Accuracy of weapons
- Yield of weapons
- Weather
- Warning time
- Degree of effectiveness of passive defenses, and
- Degree of effectiveness of active defenses.

Source: Congressional Research Service, United States and Soviet City Defense, (Washington, D.C.: U.S. Government Printing Office, 1976): 19.

[64]Ibid. Also reference to Table 4. in text indicates that the U.S. missile defense would have to achieve roughly 70 percent kill rates at each of four defense layers in order to achieve greater than 99 percent overall reentry vehicle destruction.

[65]Ibid., 20.

[66]Ibid., 23.

[67]The estimated numbers of casualties are dependent on the targets actually destroyed in an attack and which targets are spared by the missile defense. However, prediction of this kind is highly uncertain. The best possible approach is to repeat a 'Monte Carlo' statistical analysis which randomizes the likelihood that any target is actually destroyed in an attack.

[68]Leon V. Sigal, "Stability and Reduction of Nuclear Forces: The Intercontinental and Theater Levels," Bulletin of Peace Proposals, 16 (1985): 233.

[69]Ibid.

[70]Ibid.

[71]See Keith B. Payne and Colin S. Gray, "Nuclear Policy and the Defense Transition," Foreign Affairs, 62 (Spring 1984): 820 - 842.

[72]Sigal, "Stability and Reduction of Nuclear Forces: The Intercontinental and Theater Levels," 234.

[73]Gary Lee, "Soviets Warn of Retaliatory SDI Move," Washington Post, October 19, 1985, p. 14.

[74]Stephen Peter Rosen, "Nuclear Arms and Strategic Defense," The Washington Quarterly, 4 (Spring 1981): 86.

[75]Ibid., 87.

[76]William Hartung, Strategic Defense Iniative: Costs, Contractors, and Consequences, (New York, NY: Council on Economic Priorities, 1985).

[77]See "Star Wars: Will a Simpler Design Work?", Military Logistics Forum, 2 (April 1986): 56 - 58 for a discussion by Daniel O. Graham, David D. Redell, John Pike, David Parnas (former member of the Eastport Panel), and others concerning the problems associated with the SDI's computer software program.

[78]Harold Brown, "Is SDI Technically Feasible?" Foreign Affairs, 64 (1986): 454.

[79]Nevell Brown, "SDI: the cardinal questions," The World Today, (May 1986): 82.

CHAPTER FOUR

STRATEGIC NUCLEAR FORCES

The development and deployment of effective strategic missile defenses could have their most far-reaching impact on the composition and structure of the U.S. strategic nuclear arsenal. The principal objective of a U.S. strategic defense, as stated by the President and a number of Administration officials, is to foreclose on the era of offensive nuclear weapons dominance. While the technological feasibility of a strategic defense remains unproven and its strategic merits are not altogether clear, the Reagan Administration intends to explore the composition of U.S. offensive forces in a defensive world. To that end, the U.S. will be faced with choosing from a range of options for composing its nuclear arsenal. In the event that strategic defenses are highly effective, the U.S. could choose to dismantle a portion of its offensive forces, alter the force composition while integrating defenses, or further upgrade the size and capabilities of the arsenal. While the U.S. may seek to alter its offensive forces to some extent once a defensive system becomes feasible, the U.S. will continue to rely on its offensive arsenal to deter a nuclear war at least into the 1990s.

During the 1960s, strategic defenses -- ABMs, civil defense, etc. -- became one of a number of important factors in the debate over the future direction for U.S. deterrence policy. The anti-ballistic missile represented one option among the various technologies developed in the 1950s and 1960s to enhance the U.S. deterrent position. At the same

time, the ICBM matured into the principal strategic delivery system for the superpowers while SLBMs became more reliable and therefore eventually were deployed. As a result of these technological advances, the U.S. decided to deploy a redundant Triad of nuclear forces. The overall scope of these developments was part of a response to requirements to fit forces to U.S. nuclear policy and, secondly, to the development of a Soviet ABM system.

One of the most important factors in the ABM debate in the 1960s was the tremendous technological advance in offensive nuclear weapons. That is, the U.S. decided to explore strategic defenses because of the tremendous threat of destruction posed by nuclear armed ballistic missiles as compared to the strategic bombers available at the time. While the threat of a ballistic missile attack instigated ABM research, the ability of an offense to overcome the ABMs developed in the 1960s was relatively great. However, the development of the ABM also led the U.S. to make changes in the capabilities of its offensive forces. For example, the multiple independently targeted reentry vehicle (MIRV), was developed as a means of countering a Soviet ABM defense. By 1970 the U.S. began deploying MIRVed ICBMs and SLBMs and was actively researching the possibility of incorporating penetration aids for its ballistic missiles. While there was a number of other equally important factors, the ABM greatly influenced the direction of U.S. offensive force development. Not unlike this past experience, the development of strategic defenses in the 1980s and 1990s may influence the composition of U.S. nuclear forces. In addition, current offensive technological developments could influence the feasibility of a strategic defense

against Soviet ballistic missiles.

The technological pendulum, which periodically shifts from offense to defense, remained on the side of the offense during the 1960s. The signing of the ABM Treaty confirmed the dominance of offensive forces in the nuclear balance at that time and was expected to hinder the development of defenses which were perceived to be destabilizing. While it is conceivable that a truly effective missile defense could alter the principal basis of the U.S. deterrent, that being offensive nuclear forces, it will have to overcome a tremendous advantage currently held by offensive forces.

The focus of U.S. strategic nuclear policy is to deter a nuclear attack on the U.S. and its allies. These policies are effective to the extent to which any potential enemy is dissuaded from attacking the U.S. with nuclear weapons. In practice, this means that any potential aggressor must be persuaded to believe that the U.S. will use its nuclear weapons in response to an attack and has the capability to back up its policy in the event of war. Herein lies the purpose and dynamic of nuclear weapons development. As U.S. strategic nuclear policy has become ever more refined, in part as a result of the ever increasing technological sophistication in nuclear weapons, the U.S. has procured specific nuclear forces in support of these policies.

One of the objectives of U.S. nuclear policy with respect to its nuclear weapons has been to maintain both the real and perceived strengths of these forces. Secretary of Defense Brown has argued that one of "our highest military priorities includes . . . maintaining the perception . . . and the reality that U.S. forces are as capable as

those of the U.S.S.R. and that there is no level of nuclear conflict at which the U.S.S.R. can gain a military or a political advantage. We need forces of size and character so that . . . the Soviets . . . perceive that we can not be coerced or intimidated by larger or more capable Soviet forces".1 This statement suggests that strategic military strength can be measured in some fashion and it is this measure when compared to the Soviet strategic strengths which help deter a nuclear war. While it is nearly impossible to measure the perceived strength of U.S. nuclear forces, it may be possible to measure their 'real' strength.

Maxwell Taylor has stated that real strategic strength refers to "that form of military power characterized by our ability to destroy major Soviet targets, military and civilian, with nuclear weapons at intercontinental ranges".[2] The destructive power of U.S. strategic forces depends on the performance and survivability of these forces and associated equipment, the character of U.S. leaders, and the reliability and survivability of command-control-communication systems linking national command authorities to weapons.[3] The simple tabulation of strategic weapons does not provide an adequate measure of strategic strength. Rather, a measure of true strength would factor in the accuracy, reliability, and survivability of the system. The combination of these factors are considered by military planners when estimating the relative strengths of the superpower forces and will be considered when a decision to go forward on a missile defense can be made.

I. U.S. Nuclear Forces

An analysis of the implications of strategic defenses for the U.S. nuclear arsenal must begin with a description of the current U.S. arsenal and its capabilities. The U.S. offensive nuclear arsenal currently is composed of weapons systems primarily based on technology from the late 1950s and 1960s, namely the strategic bomber, the ICBM, and MIRVed reentry vehicles. The U.S. has implemented a number of upgrade programs to incorporate newer technology and has maintained a R & D program to explore various weapons systems for possible future deployment. For example, twenty-five year old bombers are being fitted with the latest cruise missile technology while a number of U.S. ICBMs have received accuracy and yield upgrades. In addition, the U.S. has explored advanced technologies such as the maneuverable reentry vehicle (MARV) concept which was designed to evade Soviet ABM defenses. The U.S. decided against the MARV as the technology did not appear to add significantly to U.S. penetration capabilities.

These forces also are deployed in support of various nuclear policies -- assured destruction, countervailing, and war fighting. In general, the current U.S. nuclear stockpile is a decade older than the latest policies and strategies it is charged with carrying out. This condition is partly the result of the development and deployment time between policy pronouncements and composition of a supporting force, but also is the result of the decision making process which has sought to secure peace by means other than through the posturing of nuclear weapons. The U.S. depends on a variety of means other than nuclear weapons to help deter nuclear war, namely strategic deterrence policy and strategy as well as arms control efforts. While the U.S. inventory

has not changed radically for 15 years, U.S. nuclear policy and arms control efforts have displayed considerable dynamism. In fact, the U.S. actually restricted its weapons development process in the 1970s in order to encourage restraint by the Soviet Union. These efforts were made in light of the original ABM Treaty and SALT I accords.

The interaction of the strategic policy formulation process, the arms control process, and U.S. domestic political constraints has a tremendous influence on the final composition of U.S. nuclear forces: U.S. military planners assess the Soviet nuclear threat to the U.S. today and in the future; based on the results of these assessments, the Department of Defense recommends policy and strategy to deter a Soviet attack.[4] While this is one of the avenues in which U.S. nuclear policy is derived, other actors have come into play in the past. Congressional influence on U.S. nuclear policy, while somewhat less precise on strategy and tactics, is generally recognized as important. For example, Congress played an important role in the confirmation of the U.S. shift toward limited nuclear options in the 1970s. Congress also has criticized efforts on the part of some Reagan Administration officials to move the U.S. more closely to a nuclear war-fighting policy. The final outcome of these deliberations is a set of policies which would guide the U.S. in a war and seek to enhance its deterrent capability.

The focus of these policies, be it assured destruction or war-fighting policy, defines the requirements for the U.S. nuclear arsenal. The mutual assured destruction model, more than any other set of strategic ideas, has provided the principal structural basis for the

development of U.S. nuclear forces. This development has taken the form of a series of improvements in U.S. retaliatory capabilities - that is, the ability of the U.S. to survive a nuclear attack and still inflict unacceptable damage on the Soviet urban-industrial base.[5] It has been only in the past decade or so that the U.S. has seriously considered effective counterforce weapons and only recently has begun to field weapons with some counterforce capabilities. The Carter Administration's most important policy pronouncement was to confirm the dominance of counterforce options in its countervailing policy. While the U.S. had explored limited and selective options for the SIOP in the past, Presidential Directive 59 made them the focus of U.S. policy. The result of this shift was a concerted effort by the Department of Defense to procure counterforce capable weapons, namely the MX ICBM, as well as improvements for the U.S. C3 system.

Congress also holds the power of the purse. As such, Congress greatly influences the actual composition of U.S. forces. The cost of the MX ICBM versus the Trident II SLBM, both counterforce weapons, had been a widely debated issue. While the MX is not yet deployed, the Trident system is going forward on schedule. Congress has questioned the survivability of the MX and while a viable deployment mode has not been agreed upon, it refuses to authorize procurement of all the MX missiles asked for by the Department of Defense.

The arms control process clearly is an important influence on the composition of U.S. nuclear forces. The various treaties which the U.S. has become a party to constrain the size and capabilities of U.S. nuclear forces. The SALT I and II accords are the most important

treaties to date in this regard. For example, the U.S. and Soviet Union are allowed to deploy no more than 2400 strategic delivery systems including ICBMs, SLBMs and strategic bombers. In addition, there are various sublimits on the number of MIRVed systems as well as the number of strategic bombers allowed to carry cruise missiles. While treaty limitations clearly constrain U.S. force developments, domestic arms control pressures also impact the U.S. force composition. Competing political groups debate the impact of various weapons programs on the arms control regime. For example, MX critics have charged that the system will provoke the Soviets to move toward mobile ICBMs and thereby preclude effective control of these systems. The Reagan Administration has criticized past arms control accords and has favored a new approach incorporating proposals to cut deeply into the superpowers' strategic arsenals. These efforts weigh heavily on the types of systems the U.S. deploys as well as its research programs for future weapons systems. On the defense side, the arms control debate is likely to have profound influence on the possible role and composition of a U.S. strategic defense.

A considerable portion of the most capable weapons in the U.S inventory today was developed, in part, as a result of the ABM debate of the 1960s. For example, the initial versions of the Minuteman III and Poseidon/C-3 systems were specifically designed to incorporate MIRV technology. Similarly, the current defense debate is likely to have profound implications for the role, composition, and size of the U.S. strategic nuclear offensive arsenal.

A brief review of the major weapons systems in the current U.S.

inventory and a discussion of their roles and capabilities as presently configured follows.[6]

A. U.S. ICBM Forces

The current U.S. land-based leg of the Triad - its ICBM forces - is composed of two major weapons systems: the Minuteman II and Minuteman III ICBMs. The U.S. also has a small number of Titan II ICBMs that are currently being deactivated at a rate of one per month. This system is essentially twenty-five years old and relies on dated technology such as liquid fueled boosters. For economic, maintenance, and safety reasons, all Titan IIs will be completely removed from the active inventory by 1987.[7]

The Minuteman II ICBM is the U.S.'s main prompt assured destruction weapon. The Minuteman II became operational in 1966 as a follow-on to the Minuteman I ICBM. The principal mission of the Minuteman II has been to pose a credible assured destruction threat to the Soviet Union. It carries a single 1.2 megaton yield nuclear warhead and is capable of destroying very wide-area targets. That is, the Minuteman II is capable of destroying moderately hard targets and soft large-area military or industrial installations requiring high yields and less than pinpoint accuracy.[8] Once the remaining Titan IIs have been removed from the active arsenal, the Minuteman II will have the largest deliverable warhead in the U.S. strategic arsenal other than a few very large bomber delivered gravity bombs.

The majority of the U.S. ICBM force is composed of 550 Minuteman III ICBMs, a MIRVed solid fueled weapon essentially similar to the Minuteman II. The latest of two Minuteman III versions represents a

phased upgrade to a portion of the force and was undertaken to provide the U.S. with a more credible hard target kill weapon as a result of Soviet efforts to harden their launch silos and command bunkers. Three hundred Minuteman III have received the Mark-12A warhead package which increased their yield from 170 kilotons (kt) to 335kt per warhead. These weapons are the only current U.S. weapon capable of directly threatening Soviet hardened ICBM silos and command bunkers in a timely fashion.

The U.S. will not add to its arsenal of time-urgent hard target kill forces until the MX ICBM is deployed in late 1986 and Trident II SLBMs are deployed in the late 1980s. The U.S. also has under development a single warhead small ICBM (SICBM), designated Midgetman, which is scheduled for deployment in the 1990s. However, both the MX and Midgetman ICBM programs have run into a number of political obstacles. The number of MX ICBMs to be deployed has been reduced from an original deployment projection of 200 missiles to a current 100. Additionally, Congress has legislated a limit of 50 MX ICBMs in Minuteman silos until a survivable basing mode can be developed for the other 50 MX ICBMs. The debate over a basing scheme for both the MX and the Midgetman has hampered the U.S.'s effort to field a new ICBM since the late 1970s.

The Midgetman is now facing greater scrutiny concerning its strategic purpose and make-up. A number of Congressmen have suggested that the Midgetman carry three warheads rather than one and that its size be increased to provide for the inclusion of penaids in the event of a Soviet nationwide BMD deployment in the 1990s. These efforts, if

successful, will obviate the original purpose for the Midgetman missile. The missile is being designed and was promoted by the Scrowcroft Commission as a small, mobile system and hence relatively invulnerable weapon. In addition, the Midgetman would allow the U.S. to preserve its land-based deterrent. As a single warhead weapon the Midgetman is likely to pose a more limited threat to Soviet strategic forces than the MIRVed MX ICBM. While Congress has decided to become more critically involved in the future composition of the U.S. ICBM force, it has been more favorable toward the Navy's modernization program.

B. U.S. SLBM Forces

The U.S. sea-based deterrent is currently composed of 43 strategic nuclear submarines (SSBNs), including 18 Poseidon submarines each carrying 16 Poseidon/C-3 missiles and 12 Poseidon submarines each carrying 16 Trident I/C-4 missiles each. Seven Trident submarines also have entered the U.S. strategic force since the late 1970s, each carrying 24 Trident I/C-4 missiles.[9]

The SLBM force is generally considered the U.S.'s most secure assured destruction force as a portion of the force is always out to sea and these submarines are difficult to locate and track for Soviet anti-submarine warfare (ASW) forces. The ability of strategic submarines to move quickly and quietly and at times lie still enhances their prospects for higher rates of survivability than either land-based missiles or bombers. A number of additional factors help prevent successful destruction of SSBNs by Soviet ASW forces. Soviet attack submarines and surface vessels must successfully track U.S. submarines as they leave their ports in order to quickly attack them in a war. In

addition, Soviet attack submarines must manuever to attack U.S. strategic submarines thereby providing U.S. ships and submarines warning of their location. United States strategic submarines can remain passive and thereby complicate the attacking submarine's job. SSBNs also have a large percentage of the oceans in which they can patrol effectively stretching and hampering ASW detection and destruction efforts. Finally, for strategic anti-submarine warfare to be effective it must be able to undertake an effective and coordinated attack to destroy a large portion of the enemy's SSBN fleet in a very short period of time. These constraints make it nearly impossible for the Soviets to destroy the U.S. strategic submarine forces in a first strike.[10]

Poseidon/C-3 SLBMs are fitted with a 40kt warhead while the Trident I/C-4 is fitted with a 100kt warhead and was provided with greater range capability over the Poseidon allowing U.S. submarines carrying Tridents to expand their areas of patrol, thereby adding to their survivability. As the number of Trident I missiles are increased - as new Trident submarines come on line subsequently requiring the retirement of Poseidon Submarines - Poseidon SLBMs have been selectively refitted with greater numbers of warheads to compensate for the fewer number of warheads on average deployed on the Trident I missiles.[11] The U.S. will begin deploying the Trident II/D-5 SLBM in the late 1980s. Trident II will be the first submarine launched strategic system with substantial hard target kill capability. This deployment will effectively provide the U.S. with a credible counterforce strategic arsenal and greatly reduce concern over the U.S.'s ability to pose a credible and flexible deterrent in the event of a Soviet first strike.

The U.S. also is increasing its sea-based offensive nuclear force with the introduction of the Tomahawk submarine-launched and ship-launched strategic cruise missile (SLCM). While the U.S. envisions deployment of thousands of the Tomahawk cruise missile, all of them are not slated for a strategic role. Among the missions envisioned for these weapons are anti-ship warfare and support to theater operations to include tactical land targeting as well as strategic targeting. The Navy began deploying SLCMs in 1984 and projects a total deployment of 194 strategic cruise missiles on 74 attack submarines as well as 190 strategic versions on 30 surface ships by the late 1980s. "The main advantage - and at the same time the main disadvantage - of the Tomahawk is the fact that it is not possible to distinguish it externally from the tactical versions."[12] The U.S. will be able to effectively saturate the Soviet Union's ocean surveillance and targeting systems. In the event of increased tensions between the superpowers, the U.S. also could deploy Tomahawk cruise missiles onboard non-naval vessels thereby greatly expanding the Soviet Union's targeting problem. Each strategic Tomahawk can carry a 200kt warhead and has a range of 1500nm. The numbers and yield of these weapons will increase the overall capability of the U.S.'s hard target kill force.[13] Another significant strategic advantage of the cruise missile is its ability to hug the ground below radar coverage and thereby penetrate Soviet air defenses in addition to its ability to strike within 200 feet of its target.

C. U.S. Strategic Bombers

The U.S. long-range bomber force is one of the most flexible legs of the Triad. Strategic bombers can carry a more diverse nuclear

weapons load, can perform a number of different missions, and can be re-called after being launched. However, the bomber force has been the subject of contention for a number of years. Critics have charged that a manned penetration bomber is no longer necessary due to the development of cruise missiles and because Soviet air defenses potentially make this form of attack extremely ineffective. In addition, the last of the B-52 strategic bombers, which represent the bulk of the U.S. bomber deterrent, were built in the early 1960s.

The active bomber inventory consists of 167 B-52Gs, 96 B-52Hs, and an additional 60 FB-111s. The bomber force is no longer as capable of penetrating Soviet airspace and is, therefore, responsible for fewer targets within the Soviet Union. Where twenty-five years ago the bomber force carried 97 percent of the U.S. nuclear weapons inventory, it currently carries roughly 23 percent while still half of the megatonnage.[14] The bomber force has been modernized on a number of occasions, most recently to begin carrying air-launched cruise missiles (ALCMs). The first squadron of 16 B-52G bombers equipped with the ALCM became operational in December, 1982. The U.S. may eventually outfit 200 B-52s to carry ALCMs with remaining bombers designated for a combination of gravity bombs and short-range attack missiles (SRAMs). In order to further modernize the bomber leg of the Triad, the U.S. has begun to deploy the B-1b strategic bomber as the principal U.S. manned penetrating bomber for the late 1980s and early 1990s when the advanced technology bomber (ATB) -- the so-called Stealth bomber -- also will begin to come on line and assume the penetration role.[15] In conjunction with the introduction of the B1-b bomber, the U.S. will begin

dismantling older B-52G bombers. Both of the new strategic bombers will be deployed with cruise missiles, presumably advanced stealth versions of the cruise, and gravity bombs.

II. Implications of a Strategic Defense

The U.S. currently seeks to deter Soviet aggression, in part, by the threat to use any of the forces described above to retaliate against a Soviet attack. Both opponents and advocates of strategic defenses have praised and criticized the 'deterrent value' of the U.S. strategic nuclear arsenal. Defense advocates such as Secretary of Defense Weinberger, perceive a need to continue strengthening U.S. strategic forces while BMD are developed and possibly later deployed. President Reagan has continued President Carter's program to procure counterforce weapons for the U.S. inventory and has made additions to the program. For example, President Reagan has resurrected the B1 bomber, pushed ahead the Trident II SLBM, and asked for the development of the Midgetman ICBM. While President Reagan has supported and initiated a number of the current strategic force modernization programs, he has alluded to the need for offensive arms reductions for a stable implementation of a strategic defense system. Former Secretary of Defense Brown, an opponent of the SDI in its current form, has charged that the current U.S. nuclear arsenal is inadequate to carrying out its counterforce missions. Brown has advocated the deployment of the MX ICBM as well as the Trident II SLBM. Finally, the Union of Concerned Scientists has charged that the current U.S. arsenal is more than adequate to deter a Soviet nuclear attack today and in the future and

does not perceive a need to upgrade or expand it. However, the ultimate judgement as to "the capability of these forces depends on the mission against which U.S. forces are measured".[16] That is, while the U.S. can confidently carry out an assured destruction retaliation against the Soviet Union, it is probably not well suited to protracted counterforce warfare.

United States strategic forces are generally viewed by military analysts as highly capable of carrying out a devastating retaliatory strike against the Soviet Union after enduring an initial Soviet strike. The office of Technology Assessment has estimated that 141 large (one megaton) U.S. weapons could destroy over 50 percent of the total Soviet industrial capacity.[17] However, "the overall U.S. counterforce capability - the ability to destroy a significant portion of Soviet retaliatory forces - is minimal".[18] The Carter and Reagan Administrations have pushed to acquire counterforce capable strategic weapons in an effort to support U.S. counterforce nuclear policy, namely embodied in Presidential Directive 59. If the U.S. begins to shift its nuclear deterrence policy to incorporate strategic defenses, it may alter the composition and mission of its offensive nuclear forces.

An important consideration for U.S. policy planners in a defensive world will be the mission which U.S. offensive forces will be charged with executing. Clearly, U.S. policy will continue to emphasize the deterrence of Soviet aggression and U.S. strategic offensive forces will be responsible for posing a credible deterrent to the Soviet leadership along with defense forces that are deployed. However, the actual wartime role of U.S. offensive forces will be dependent on a number of

factors. The most important factor in this regard is the interaction or balance of missions between the offensive and defensive forces in the U.S. arsenal. If the U.S. pursues a robust strategic defense policy, offensive nuclear forces might relinquish their current role of deterring nuclear war by threatening to deny the Soviets a successful attack. In effect, U.S. policy might shift to emphasize 'defense' as a deterrent. In this environment, the role of U.S. offensive nuclear forces could be defined in a more traditional assured destruction mode. However, the currently projected limits on a missile defense -- Soviet countermeasures, C3 problems, and the difficulties and costs of maintaining the system -- will influence the extent to which the U.S. revises its offensive force missions. The U.S would have the option of continuing to rely on its offensive forces for limited counterforce missions or to seek more demanding war-fighting roles for its offensive forces. These options are displayed in the following tables.

Table #6 displays the projected gains in U.S. counterforce capabilities in the early 1990s as a result of the deployment of the MX ICBM and Trident II SLBM. The mission capabilities of U.S. offensive forces may then remain constant as a result of a cancellation of the Midgetman ICBM and deployment of a strategic defense. The mission capabilities of remaining U.S. offensive nuclear forces also will be influenced by Soviet defensive deployments and in time might decline.

Table #7 displays an increase in U.S. counterforce capabilities from MX and Trident II deployments as well as possible Midgetman deployments. The offensive mission might then be expected to fall off and an assured destruction posture to prevail as an effective missile

defense was deployed and U.S. offensive forces were dismantled.

Table #8 portrays the option to increase constantly the U.S. counterforce capabilities in an effort to achieve an effective war-fighting posture. In this case, the Trident II, MX, and Midgetman could be expected to play an integral role in addition to a robust ballistic missile defense.

TABLE #6 MAINTAIN LIMITED COUNTERFORCE ROLE

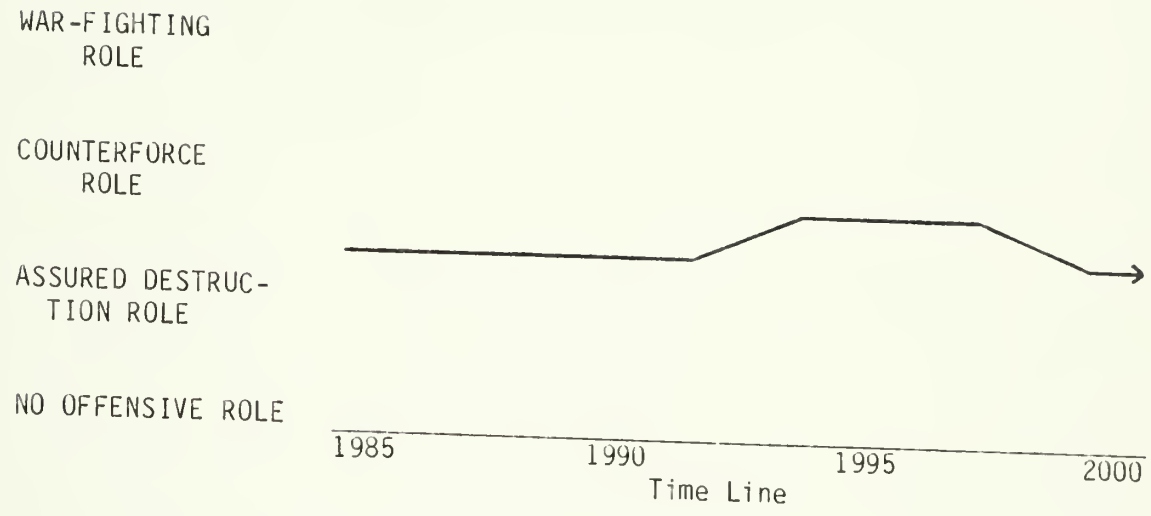


TABLE #7 PROVIDE ASSURED DESTRUCTION ROLE

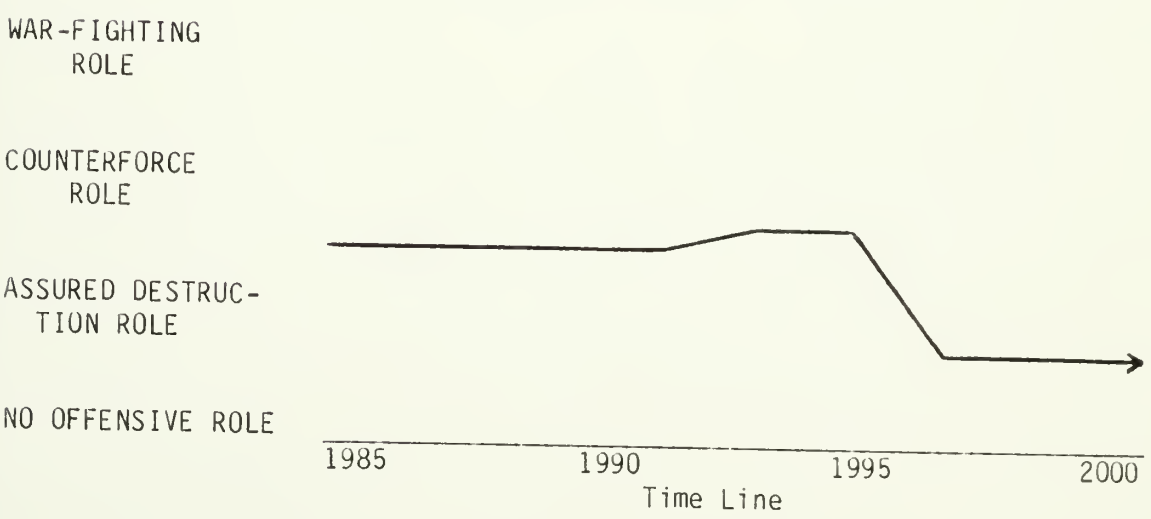
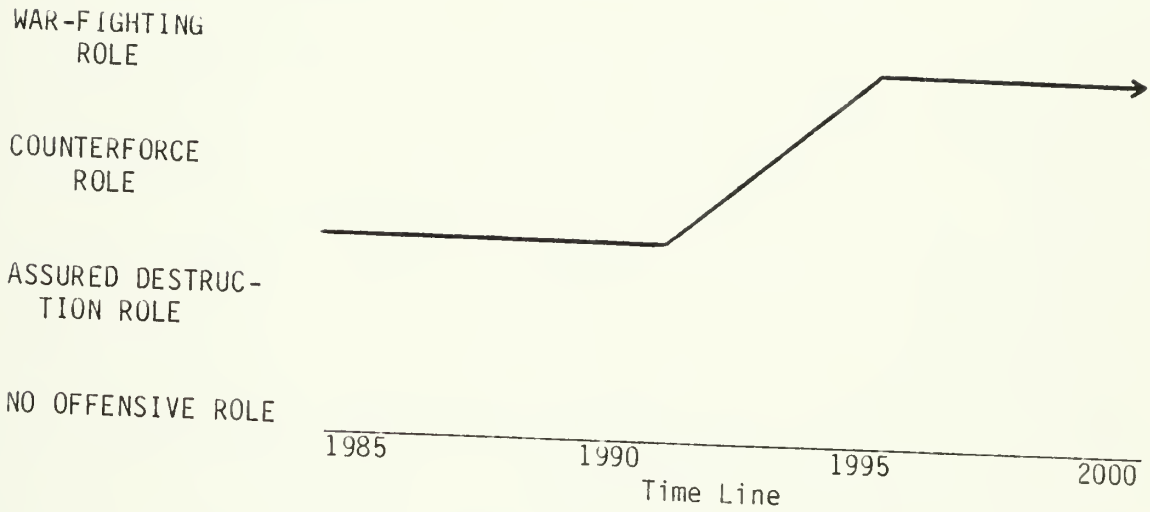


TABLE #8 ENHANCE TO WAR-FIGHTING ROLE



Clearly, these tables only portray some of the options open to U.S. policymakers. A number of other factors will influence the direction of U.S. offensive force capabilities and roles. The prospects for arms control with the Soviet Union with respect to both offensive and defensive forces could change the roles that offensive forces would be expected to play if a strategic defense became available. The likelihood of a Soviet missile defense and its corresponding level of effectiveness will greatly influence the future role of U.S. offensive forces. In addition, the costs and operational effectiveness of a U.S. strategic defense will influence the requirements for offensive deterrent forces as well as the size and composition of these forces. For example, U.S. offensive forces could continue to have a counterforce wartime role as a threat to deny the Soviets a victory by placing their military forces at risk. As such, U.S. offensive forces could play a co-equal deterrent role with a deployed strategic missile defense.

It is unlikely that the U.S. will completely dismantle its offensive forces or seek to deploy them in a true war-fighting role even if ballistic missile defenses become a reality. There are a number of strategic reasons for maintaining an offensive nuclear arsenal and preserving their current deterrent role, namely a limited counterforce strategy as displayed in Table 6. The procurement of additional counterforce weapons while also procuring an effective missile defense might appear to the Soviets to be a U.S. effort to create a first strike capability. That is, a condition might arise where a defense protected U.S. could strike against Soviet nuclear forces with near impunity, sufficient to deny the Soviets a meaningful second strike retaliatory

capability. Hence, offensive forces in this mode along with a deployed missile defense could appear to be provocative and potentially destabilizing.

There are indications that the Reagan Administration and, more specifically, the Department of Defense have begun to address the issue of offensive and defensive integration and the role for offensive forces. A nuclear strategy review was initiated in 1985 that focuses on the integration of a U.S. strategic defense with its offensive forces. The intent of the review is to "update U.S. nuclear employment plans and provide guidance for the transition from offense to defense in the 1990s" should defenses prove feasible.[19] According to press reports, the review envisions the integration of offensive and defensive forces under a new nuclear war-fighting command structure. Given the Reagan Administration's plans to procure counterforce capable strategic weapons -- plans established prior to the initiation of the SDI -- and their associated C3I elements, it is not surprising that the Department of Defense will proceed with its original modernization plans while studying the integration of defenses.

The Soviets have repeatedly charged the Reagan Administration with seeking offensive superiority and that a U.S. missile defense would act as an offensive weapon system. Although the technological focus of the SDI as described by President Reagan is clearly defensive, there are a number of ways in which a U.S. missile defense could be used to augment U.S. offensive forces and an offensive nuclear strategy. First, a missile defense might be deployed to preserve an offense dominant force and deterrent. That is, the U.S. would continue to rely on its

offensive nuclear forces to deter Soviet aggression and a U.S. ballistic missile defense could augment their role. A point defense of U.S. ICBM silos would fit well in this role, as previously described in Chapter 2. Second, as alluded to above, a U.S. offensive strategy designed to strike first to limit the damage Soviet forces could cause to the U.S. may be greatly enhanced by missile defenses charged with destroying Soviet forces left undamaged by a U.S. counterforce attack. The Soviets claim that the SDI in conjunction with the Reagan Administration's current plans to deploy more capable counterforce weapons - the MX ICBM, Trident II SLBM, and the B1-b and advanced technology bombers - will provide the U.S. a first strike offensive force and thereby some damage limitation capability. These efforts, charge the Soviets, represent a clear attempt to regain nuclear superiority and render the Soviet nuclear force inferior.

Another issue largely ignored by the Reagan Administration to date is the potential anti-satellite capability of a U.S. missile defense system. While a laser defense against Soviet ballistic missiles may be impossible, satellites are relatively passive targets that might be easily destroyed by laser weapons. As such, these weapons could perform an offensive role by destroying Soviet satellites prior to a U.S. attack thereby degrading the Soviet Union's space-based surveillance and communication capabilities.

A second reason why the U.S. is unlikely to dismantle its offensive deterrent completely is the fear that in the absence of an arms control agreement or mutual reductions the U.S. could be caught by surprise without an offensive force sufficient to deter an attack in a crisis.

In addition, the U.S. would want to remain confident of its deterrent capability in the event that the Soviets developed effective countermeasures to a U.S. missile defense.

The U.S. will maintain, at the very least, an assured destruction retaliatory force as a means of protecting against countermeasure advances against a U.S. defense and as a means of deterring third party nuclear forces. As such, the U.S may cancel the further modernization of its forces, dismantle some of its counterforce weapons, completely remove its ICBMs in favor of SLBMs, or reduce the overall size of its nuclear arsenal. A number of defense advocates, such as Keith Payne, have argued against these options, at least during the initial phases of a defense deployment. Payne has argued that the U.S. must remain offensively prepared for war until an effective BMD could accept the lion's share of U.S. deterrence responsibility.[20] However, Payne fails to appreciate the potentially destabilizing influence that dual offensive improvements and defensive deployments may pose. In the absence of some offensive arms reductions agreements, particularly concerning counterforce weapons, the U.S. is likely to maintain some counterforce capabilities as a means of threatening Soviet strategic assets and Soviet national command authorities (NCA).

Ultimately, the key factor concerning the future role and composition of U.S. nuclear forces will be their expected wartime role. In this regard, the U.S. may go beyond the current force modernization programs described above which are being implemented to develop a more capable counterforce strategic arsenal.[21] Among the forces likely to exist by the mid-1990s or the turn of the century when a decision to

deploy missile defenses could be made are a number of MX and Midgetman ICBMs with some remaining Minuteman III missiles, the Trident I and II SLBMs, numerous cruise missiles on B-1b bombers as well as cruise missiles and new gravity bombs on the ATB, and finally a number of submarine- and ship-launched strategic cruise missiles now being deployed. The combination of accuracy and lethality of these forces will pose a credible hard target kill capability to the Soviet Union's strategic forces and their command and control infrastructure as presently configured.

Each of these preceeding descriptions assumes to varying degrees that ballistic missiles will continue to be a major, if not the most important, component in the U.S. offensive arsenal. Assuming that some kind of strategic nuclear force is maintained by the U.S., the mix between ballistic missiles, namely ICBMs, SLBMs, and air breathing forces, is likely to be widely debated in policy circles. Ballistic missiles are likely to be increasingly less capable of performing their current missions in a defensive balance. That is, ballistic missiles may have less utility for specific counterforce and other war-fighting roles. For example, a missile defense capable of a high percent kill ratio could severely restrict, if not altogether preclude, the attacker's ability to predict which targets were destroyed. However, defenses will not completely degrade the ballistic missile's deterrent value as these weapons could still pose a residual assured destruction threat.

In order to execute a successful attack, many thousands more ballistic missiles may be required in a defense dominated world. The

expansion of nuclear forces is likely to increase the level of collateral damage. The defense, in turn, will lower the attacker's confidence for a successful attack. As a result, an attacker may seek to destroy or degrade the defender's missile defense as another means of securing a successful attack. Under these conditions the U.S. may seek to transfer some, if not the major portion, of its offensive forces to SLBMs, although they may be vulnerable to some degradation in utility from a Soviet missile defense. The advantage of using SLBMs is the height of their trajectory and time from launch to target, which can be significantly less than ICBMs and which can make the task of tracking and destruction for a missile defense more difficult. On the other hand, depressed trajectories also lead to a degradation of missile accuracy and thereby lessen the confidence of target destruction and potentially increase the levels of collateral damage.[22]

A potentially more effective option than SLBMs would be to shift U.S. offensive forces to strategic bombers and cruise missiles (ALCM and SLCM). The strategic advantages of a manned penetration bomber lie in their ability to be retargeted at any time during their attack sequence as well as their ability to attack multiple targets. Strategic bombers may prove very useful against the new generation of Soviet mobile nuclear systems which can relocate to hide from U.S. targeteers. Strategic bombers can act as surveillance platforms to locate mobile weapons and subsequently destroy them. However, U.S. strategic bombers also must contend with an extremely dense Soviet air defense network and as a result are less likely to survive once they deviate from planned flight routes.

The U.S. had begun exploring the use of cruise missiles shortly after acquiring German technology in World War II. However, during the 1950s these weapons were abandoned in favor of the ballistic missile as they proved cumbersome for ships and aircraft. Today the cruise missile offers a number of strategic advantages as compared to the ballistic missile stemming from the miniaturization of nuclear warheads and fuel efficient engines. While the cruise missile has a number of equally compelling disadvantages --the missiles are relatively slow -- the cruise missile is relatively small and can fly great distances at extremely low altitudes. The range of the ALCM and SLCM designated for strategic missions is roughly 1500nm. In the case of the ALCM, this range allows the U.S. to attack roughly 85 percent of strategic targets in the Soviet Union without bombers entering Soviet airspace.[23] The missiles' guidance packages, called Tercom assisted inertial navigation system (TAINS), allows the missiles to achieve great accuracy thus making them potential hard-target kill weapons when equipped with sizeable nuclear warheads. A final advantage of the cruise missile is its procurement and maintenance cost. Thousands of cruise missiles can be deployed at the cost of a few new ballistic missiles. The missile requires minimal support facilities and a relatively simple launcher.

The cruise missile may be able to act as an insurance against the deployment of a Soviet ballistic missile defense that degrades the penetration advantages ballistic missiles currently have over aerodynamic forces.[24] Given the potential for the cruise missile to reach its target even in a highly defended environment, the U.S. will need to be concerned with the expected deployment of Soviet sea-launched

cruise missiles in the late 1980s, well before a U.S. BMD can be deployed. As such, the U.S. will either have to reconsider its ballistic missile defense program or begin a strategic air defense initiative to handle Soviet air breathing threats. The decision to go forward with either a ballistic missile defense and/or an air defense system will be dependent not only on their corresponding levels of effectiveness against the threat but also the dollar expenses to develop and deploy these defenses at the same time and the relative costs to the Soviets to circumscribe the defenses.

The U.S. is currently exploring an advanced cruise missile (ACM) that might add to the overall effectiveness of these weapons. The ACM will be carried by the B1-b and ATB and will have greater range, accuracy, and targeting flexability than current cruise missiles and be able to perform evasive maneuvers. In addition, the ACM will incorporate stealth technology reducing its radar cross-section while a new engine will lower its infrared signature.[25] The combination of these improvements to the cruise missile will make it a more difficult threat for the Soviet air defense focus to contend with and a potentially more useful weapon for the U.S. to employ.

One major disadvantage of the cruise missile is its flight time to target. Most cruise missiles will be carried on U.S. strategic bombers which would fly up to the Soviet coasts and then release their missiles for the second leg of the attack. One option for reducing the total attack time could encompass the deployment of SLCMs on submarines that would patrol close to the Soviet Union's coast. In addition, the TAINS guidance system which depends on geographic height variations currently

restricts the cruise missile to certain penetration routes.[26] The cruise missile also is subject to direct countermeasures by current Soviet air defense weapons, including air defense interceptor aircraft and strategic surface-to-air missiles (SAMs).

While these weapons systems can not provide the time urgent capabilities of ICBMs and SLBMs in most cases, they are likely to be more survivable and may be able to penetrate Soviet defenses more easily than ballistic missiles should the Soviet Union also deploy a ballistic missile defense. In fact, the addition of significant numbers of SLCMs could provide the U.S. with an effective hard-target kill weapon thereby providing an important redundancy in this weapon category. However, their introduction on a wide scale by the Soviets also could pose a significant problem for the United States. Soviet submarines and ships deployed just off the U.S. coast could destroy a portion of U.S. military and economic assets within minutes of launching their cruise missiles. A U.S. ballistic missile defense of the kind currently envisioned might have almost no capability against these forces. The U.S. would have to consider rebuilding a nationwide air defense net of surface-to-air missiles and a fleet of fighter interceptor aircraft.[27]

The U.S. also could seek to increase the numbers of its intermediate range ballistic missiles (IRBMs) with strategic roles stationed in Europe, namely the Pershing II. These weapons, which currently total 108, are extremely accurate due to terminal guidance and have hard-target kill capabilities. The Pershing II can arrive on Soviet targets within eight minutes from West German launch points. From another perspective, the U.S. may no longer require the capability

to destroy Soviet military assets in as time urgent a fashion. That is, should ballistic missile defense effectively preclude counterforce attack options -- an effective BMD could prevent predictable targeting with ICBMs and SLBMs -- an assured destruction retaliatory strategy would likely prevail. The success of counterforce and war-fighting attacks is likely to be severely degraded by a missile defense thereby requiring either greater forces in an attack or precluding these kinds of attacks altogether. In addition, retaliation does not demand the execution of an attack within minutes of an initial strike. Therefore, ICBMs and SLBMs may not be perceived as required any longer.

Finally, ballistic missile defenses are likely to lead to a concerted effort by the U.S. and Soviet Union to develop and deploy countermeasures to ballistic missile defenses. Although a number of countermeasures have been previously developed, i.e. chaff and balloons deployed by the ICBM 'bus' to confuse the defense's identification and tracking subsystems, there may well be a tremendous expansion in countermeasures technology. This expansion could erode the defense's effectiveness and thereby enhance the offense's ability to penetrate. Ballistic missile defense countermeasures can be categorized as both active and passive. Passive countermeasures include changes to the ballistic missile, additions to its ability to avoid and penetrate a defense, and tactics designed to confuse or overwhelm the system. Active countermeasures to a U.S. BMD include ASAT weapons, space mines, and electromagnetic pulse from the detonation of a nuclear weapon either in space or in the atmosphere to blind or degrade the defense's sensors. The Soviets probably are actively seeking effective countermeasures to

any potential U.S. strategic defense. They have repeatedly stated that they will perfect and deploy countermeasures to prevent a U.S. strategic defense from creating asymmetries in the strategic military relationship between the superpowers.

Among the countermeasures often mentioned by the Soviets are methods to attack and degrade or destroy space-based laser stations. The Soviets have listed among these space mines and ground-based lasers. The Soviets have pointed out that a ground-based laser countermeasure is cheaper and easier to operate than a space system. In addition, the power required to disable a space platform is less as the dwell time is substantial as satellites pass over the Soviet Union. The Soviets also have stated their intention to upgrade their offensive forces should the U.S. proceed with deploying a defense. Such measures include increases in the numbers of missiles, warheads, and dummy reentry vehicles creating difficulties for the detection systems of a U.S. defense. They have spoken of depressing their SLBMs and adding cruise missiles in different basing modes to their strategic arsenal.[28] These methods may prove highly effective against a U.S. missile defense.

The U.S. strategic nuclear arsenal is in the midst of a major modernization program. That program will be nearing completion by the time the U.S. could decide to deploy a strategic missile defense. By the mid 1990s, the U.S. will have new ICBMs, SLBMs, and two new strategic bombers in its strategic force. These weapons will be far more capable than the current force for carrying out counterforce strikes on Soviet strategic forces and other critical war-supporting assets. The introduction of strategic defenses of the kind envisioned

by President Reagan may lead the U.S. to debate the role of its offensive forces. However, the technological, strategic, and political obstacles to an effective strategic defense are numerous and may preclude its ever being deployed. Given the number and nature of these obstacles and the uncertainty over the nature of the strategic balance in the 1990s, it is likely that the U.S. will maintain its offensive deterrent. Any effort to radically alter the composition and mission of U.S. offensive nuclear forces prior to or during a defense deployment is likely to be considered premature. Finally, while strategic defense technology appears to be gaining leverage on offensive forces, there is little doubt that offensive countermeasures as well as new offensive technology will be developed that may assure the offense's dominance in the coming decades.

Endnotes Chapter 4

[1]Maxwell D., Taylor, "Perceived Versus Real Strength of America's Strategic Forces," Parameters, 9 (December 1979): 7.

[2]Ibid.

[3]Ibid., 8.

[4]See Soviet Military Power 1986, (Washington, D.C.: U.S. Government Printing Office, 1986). It provides a current assessment of the Soviet nuclear threat to the U.S. as perceived by the Reagan Administration's Department of Defense.

[5]Alun Chalfont, "SDI in Context," Proceedings, 112 (April 1986): 72.

[6]Refer to APPENDIX A for an overview of the U.S. strategic nuclear arsenal.

[7]There are fewer than 20 Titan II ICBMs remaining in the active U.S. nuclear arsenal and although they will remain the largest countervalue weapons in the U.S. inventory until early 1987 - with a warhead yeild between 5 and 9 megatons - they will not be considered further in this study. "Preparing for Nuclear War: President Reagan's Program," The Defense Monitor, 10 (1982): 1 - 16.

[8]Thomas B. Cochran, William M. Arkin and Milton M. Hoenig, Nuclear Weapons Databook, Volume 1 Cambridge, MA: Ballinger Publishing Co., 1984, 114.

[9]James L. George, "Start and the Navy," Proceedings, 112 (April 1986): 35. Also see "Strategic Nuclear Forces of the United States and the U.S.S.R.," Arms Control Today, 15 (June 1985): 9, for a description of the U.S. sea-based strategic force.

[10]Alton H. Quanbeck and Barry M. Blechman, Strategic Forces, Issues for the Mid-Seventies, (Washington, D.C.: The Brookings Institution, 1973), 80.

[11]"Strategic Nuclear Forces of the United States and the U.S.S.R.," 9.

[12]Ezio Bonsignore and Norman Friedman, "The cruise missiles and their technology," Military Technology, 7 (April 1983): 66.

[13]"Preparing for Nuclear War: President Reagan's Program," 6, 13.

[14]"Preparing for Nuclear War: President Reagan's Program," 4.

[15]The advanced technology bomber (ATB) is so named for its ability to absorb the energy emitted by radars thereby reducing its 'signature' and radar cross-section. The plane's shape and material composition will allow it to penetrate enemy air defenses by evading radar detection.

[16]Barry R. Posen and Stephen Van Evera, "Defense Policy and the Reagan Administration," International Security, 8 (Summer 1983): 13.

[17]Office of Technology Assessment, The Effects of Nuclear War, (Washington, D.C.: U.S. Government Printing Office, 1979), 76.

[18]Posen and Van Evera, "Defense Policy and the Reagan Administration," 13.

[19]Richard Holloran, "U.S. Studies Plan to Integrate Nuclear Arms with a Missile Shield," New York Times, 29 May, 1985, p 8.

[20]Keith B. Payne, Talk given on Ballistic Missile Defenses at the Heritage Foundation, Washington, D.C., March 1, 1985.

[21]See "Preparing for Nuclear War: President Reagan's Program," The Defense Monitor, 10 (1982): 1 - 16 for a detailed discription of the current U.S. nuclear force modernization program.

[22]Jeffrey T. Richelson, "Old Surveillance, New Interpretations," Bulletin of the Atomic Scientists, 42 (February 1986): 20.

[23]Bonsignore and Friedman, "The cruise missiles and their technology," 76.

[24]Bonsignore and Friedman, "The cruise missiles and their technology," 66.

[25]"USAF faces the future," Flight International, 129 (May 17, 1986): 13.

[26]Bonsignore and Friedman, "The cruise missiles and their technology," 74.

[27]George C. Wilson, "Sea-Based Missiles Defy Limiting," Washington Post, 9 November, 1985, p 8.

[28]See Nikita Zholkuer, "Taking up a Point," Moscow New Times, No. 15 (21 April 1986), p 31.

CHAPTER FIVE

STRATEGIC DEFENSES AND STRATEGIC ARMS CONTROL

Strategic arms control has played an important role in U.S. deterrence policy since the late 1950s when U.S. officials began to appreciate that the U.S. was becoming increasingly vulnerable to Soviet nuclear forces. As a result, the view of arms control as an effective means of enhancing the deterrent relationship between the superpowers intensified. In addition, the signing and negotiation of an arms control agreement came to be perceived as one measure of the stability of the strategic balance. While negotiations and agreements have been difficult if not illusive for the past six years, arms control remains a critical measure of stability and key to the future of the strategic balance.

The objectives and roles promoted for strategic arms control have expanded since the 1960s and resulted in the signing of a number of agreements between the U.S. and Soviet Union. These agreements were structured in a fashion as to regulate the strategic competition between the superpowers and, in turn, to help reduce the risks of a nuclear war. While strategic analysts and politicians have argued over the relative merits and faults of the various standing agreements as well as the arms control process, arms control continues to be an important component of U.S. deterrence policy. A substantial part of the debate concerning U.S. deterrence policy that emerged in the late 1970s focused on the

strategic value of arms control for U.S. security.

President Reagan's strategic defense initiative is a consequence, to some extent, of his Administration's disillusionment with the arms control agreements in force and the Administration's perception of a flawed arms control approach by past administrations. The Reagan Administration also is concerned with the pattern of U.S. responses to the Soviet nuclear buildup and is particularly interested in the emergence of new defense technologies and their potential role for enhancing U.S. security. Regardless of the justification for the SDI that relates to arms control, it is difficult to ignore the impact that standing agreements and the arms control process continue to have on U.S. policy.

The U.S. has advocated arms control to help promote and maintain its national security, in the broadest sense. The U.S. also has sought to restrain Soviet aspirations to use nuclear weapons, either directly or indirectly, to defeat the U.S. and its allies by tying the Soviets to certain mutually accepted 'rules' of the game. In this case, these rules concern the numbers, types, and capabilities of strategic nuclear forces that the superpowers are allowed to develop and deploy.

Chapter One reviewed some of the various arguments made against ABM systems in the 1960s, one of which charged that defensive weapons would accelerate the arms race. In addition, critics of the ABM claimed that a defensive arms control agreement could restrain an arms race between the superpowers. Similar arguments have re-appeared since President Reagan's initiation of the SDI and his call to "render ballistic missiles obsolete". For example, the New York Bar Association's

Committee on International Arms Control and Security Affairs has issued a report critical of the Reagan arms control approach. The central charge of the study is that "a key danger" of the SDI "is that a large U.S. program on nationwide ballistic missile defense will result in an acceleration of the Soviet offensive buildup . . . and will lead to an unregulated arms competition".[1]

Former Secretary of Defense McNamara, an architect of U.S. nuclear policy in the 1960s that ultimately lead to the control of defenses to prevent an arms race, has actively spoken against the SDI on the grounds that it will "sharply escalate the arms race because", as he states, "the Soviets will expend unlimited funds to invent weapons to defeat it".[2] McNamara has argued that, although the SDI may develop a deployable missile defense system for the U.S., "the concept" of a defensive balance "can not work because all of the (Reagan) Administration's star wars plans . . . call for the U.S. to continue to rely on offensive weapons".[3] The arms race critique of the SDI is one part of an ongoing debate concerning the very nature and role of arms control in U.S. deterrence policy. That role, illustrated by the signing of the ABM Treaty and SALT agreements, has been characterized by efforts to preserve U.S. security while setting limits on the offensive nuclear forces and defensive forces of both superpowers. The Reagan Administration came to power criticizing both existing arms control agreements, in particular the unratified SALT II Treaty and the arms control process in general. The Administration's missile defense proposal has heightened the arms control debate by questioning the basis of the existing arms control regime. By establishing the goal of a

strategic defense against ballistic missiles, the Administration has questioned the deterrence value of the ABM Treaty.

A discussion of the implications of the SDI for arms control can be divided into two major sections. The first section will analyze the role of arms control in a defense augmented or dominated strategic balance. The second section will address implications for existing treaties.

I. Strategic Defenses and the U.S. Arms Control Process

The possibilities of an effective defense against a ballistic missile attack pose a number of problems for strategic arms control between the U.S. and Soviet Union including the potential violation of existing treaties and the more fundamental issue concerning the future of arms control as traditionally approached. Donald Snow goes as far as to argue that "the introduction of BMD on any meaningful scale will require some basic adjustments to our conceptions of deterrence, and because arms control has been based on these conceptions, it is likely to be traumatic for arms control as well".[4]

U.S. strategic arms control policy has been nearly coequal in importance with other components of U.S. deterrence policy. Until the Reagan Administration, arms control had played a more active role in U.S. efforts to reduce the risks of war, reduce the potential damage that might otherwise be suffered should war occur, and reduce the burdens of peacetime defense preparations by slowing the nuclear arms race.[5] These objectives appear to be very similar on a strategic level

with the goals associated with the strategic defense initiative, namely a lowering of the nuclear threat, an increase in crisis stability, and greater incentive for reductions in offensive nuclear weapons. These later goals were enumerated in the Hoffman Report commissioned by President Reagan in 1983. However, the basic approach of U.S. arms control policies in the past and the defense initiative of the present clash from a practical, if not philosophical, stand. A solid understanding of this conflict begins with a review of the foundations upon which strategic arms control in the U.S. has been built.

The primary purpose for which arms control has been sought by the U.S. is a reduction in the risks of a nuclear war. The first official consideration of an arms control policy by the U.S. came in 1954 with the establishment of a Panel of Consultants on Disarmament chaired by Robert Oppenheimer.[6] The Oppenheimer Panel concluded that the U.S. needed to pay particular attention to reducing the dangers of a surprise nuclear attack on U.S. strategic nuclear forces. The issue of force vulnerability was later grafted onto the concept of crisis and strategic stability and has been a part of the nuclear debate since this time. The threat to U.S. strategic forces, namely U.S. bomber bases, was under review by Albert Wolhsetter at the Rand Corporation when the Panel's Report was issued. The combination of these studies highlighted the problems associated with reducing the threat of a surprise attack on U.S. forces and provided an impetus to a number of academic discussions on arms control. The development of theories concerning the role that arms control could play in U.S. deterrence policy followed shortly thereafter. In effect, these studies asked the question: can strategic

arms control provide a useful means for stabilizing the strategic balance and enhancing U.S. security?[7]

Studies conducted by analysts such as Morton Halperin, Thomas Schelling, Hedley Bull, and others established a number of major tenets of an early U.S. arms control theory in the 1960s.[8] Jospen Kruzel has identified four major themes as a result of his review of these works.

1. The primary importance for arms control is to enhance stability and reduce the vulnerability of the U.S. to a surprise attack.[9] The emergence of the ICBM as the central strategic weapon of the superpowers had further dramatized the threat of a surprise attack on U.S. forces. A critical objective in these authors' opinions was for the U.S. to develop and deploy invulnerable weapon systems. These early remarks were accurate in projecting the vulnerability problem as a major issue of the deterrence debate of the 1970s.

2. Secondly, these early theorists placed particular importance on the avoidance of an accidental nuclear war for which they argued was a need to improve communication links between the United States and Soviet Union.[10] The establishment of the Washington to Moscow 'Hot Line' was one result of this idea and the advancement of communication links has remained an important project among arms control advocates. Some of the more recent examples of these kinds of communication mechanisms include the Standing Consultative Committee (SCC) established by the SALT I accords in which the superpowers can raise questions of treaty compliance or any other strategic issue. A recent proposal by Senator John Warner of Virginia calls for the establishment of a Crisis Command Center permanently and jointly manned by Soviet and U.S. delegates which

could pass critical military and political information between the superpowers as a means of diffusing potentially explosive situations.

One of the proponents' arguments for the ABM system in the 1960s was that an ABM system could help protect against an accidental war. Should a ballistic missile be accidentally launched by a superpower or a third party nation, an ABM defense might be able to destroy the missile before a retaliation might be ordered. A number of defense advocates have reiterated this argument today. Another major concern is that the proliferation of nuclear weapons could increase the likelihood of an accidental missile launch or nuclear detonation and that these conditions might quickly draw the superpowers into a war.

3. A third theme was the notion that the new enterprise of arms control need not be explicit.[11] In effect, these theorists suggested that arms control need not involve formal negotiations or treaties. Some of the early theorists argued that unilateral measures and/or informally agreed upon steps to reduce weapons or control certain aspects of the strategic balance could provide equally successful measures to reduce the risks of war as could formal agreements. While there have been proposals for unilateral arms reductions efforts since the 1960s, particularly in the West, neither superpower has taken major steps in this direction. For example, the U.S. has continued to reject Soviet proposals to follow its lead in declaring a nuclear weapons test moratorium. The Reagan Administration's response has been to argue that the U.S. must continue testing in order to catch up with Soviet weapons development efforts. In addition, Teller's SDI program for a nuclear pumped X-ray laser defense requires the testing of nuclear weapons.

4. Finally, these theorists emphasized that the U.S. should maintain a "keen appreciation for the limitations of arms control".[12] There was a clear understanding that arms control was not disarmament but that it was a potentially effective instrument for stabilizing the strategic balance. That is, arms control could not be expected to solve U.S. strategic security problems; rather, it might help prevent certain kinds of superpower activities or events that could have very serious and adverse influence on the security of the United States.

As Kruzel has argued, and taken as a whole, the basic principles of these early theorists present arms control as a modest but useful process.[13] These theorists were largely arms control conservatives. The task, then, for arms control was to help safeguard the condition of mutual deterrence. Arms control was to be a coequal part of U.S. defense policy, rather than a substitute for it.[14]

The arms control process has been expanded beyond these modest principles and goals and has been charged with a broader task. While the preservation of stability was an overriding objective of the early arms controllers, it has often taken an equal or second seat to other objectives. "A serious problem for modern U.S. arms control has been confusion over objectives, over the basic purpose of the entire enterprise".[15] That is, it has become increasingly more difficult to obtain agreement within the U.S. and Western strategic community on the nature of more comprehensive and complex accords. For example, the ABM Treaty and SALT I accords were presented to the U.S. Congress and public and justified as appropriate steps that would lead to offensive nuclear arms reductions. Having failed to achieve arms reductions, arms control

"in its objective of security in the presence of arms, by means of stabilization techniques", has all but "veered back to the notion of counting guns in an age when advancing technology has all but eclipsed such possibilities".[16] A number of obstacles have developed that influence the likelihood of achieving arms agreements. Clearly, the most important factor is the general degree of political willingness displayed by the superpowers to reaching an agreement. However, there are a number of domestic political impediments to arms control.

Steven Miller has suggested that the arms control process does not lack for ideas and proposals, just success. Miller argues that much of the failure to achieve agreements is due to domestic political factors.[17] Miller further suggests that while politics can prevent agreements, it is not always to the detriment of U.S. security. Two phases of arms control can be described. On the one hand, the policy formulation process occurs in which negotiations among the various branches of the government are conducted. The Department of State, Department of Defense, the Arms Control and Disarmament Agency (ACDA), and Congress often have their own differing arms control agendas for political and foreign policy concerns.[18] The most important player at this juncture is the White House. Any policy, therefore, is the result of considerable position jockeying and political bargaining as the various interests of the players are often quite opposed. For example, the Department of Defense is concerned with a myriad of defense issues -- budgetary, weapons procurement, and safety -- all of which become very complex when interfered and constrained by arms agreements. However, these conflicts do not take away from the fact that arms

control agreements can enhance U.S. security by constraining certain weapons systems.

On the other hand, a second phase of arms control lies in the politics of ratification.[19] During the initial phase the White House leads, however, the Senate becomes the center of attention during the ratification process. The critical factor in this regard concerns the handling of minority groups, either for or against the agreement. For example, 34 Senators can block the ratification of a treaty. While public opinion also can be brought into the ratification process, the game of politics rules. And, as demonstrated by the SALT II ratification debates, the outcome is not necessarily guaranteed even after an agreement has been signed.[20]

Miller concludes that the "results of arms control" -- seen, in general, as disappointing -- "seems to be a consequence of the effects of an imposing set of political impediments: policy formulation, the ratification process, electoral politics, congressional politics, bureaucratic politics, public opinion, even international politics, (all of which) have to be aligned properly or managed effectively if arms control is to be pursued successfully."[21]

Finally, the absence of a few components in favor of an agreement can prevent its successful completion. For example, while there appears to be strong public and Congressional support for arms control today, the Reagan White House has appeared less interested and consequently no agreements have been reached during the Reagan Presidency.

In uniliteral Statement A of the ABM Treaty, the U.S. specified that it considered an offensive arms reductions treaty critical to its

'supreme interests' and the failure to achieve such an agreement would represent a sufficient basis for withdrawal from the Treaty.[22] It required more than five years, the time prescribed by Statement A, for a new strategic arms limitations treaty to be negotiated and signed. The SALT II Treaty has never been ratified by the U.S. for various reasons, among them the growing debate in the U.S. over the value of such treaties to U.S national security. In addition, the Reagan Administration has put added pressure on the standing treaties as well as U.S. compliance with SALT II by publishing reports of Soviet violations of the Treaty. Some arms control critics, such as the conservative Heritage Foundation, have urged the U.S. to take steps to counter reported Soviet Treaty violations to include withdrawal from the Treaty. However, the Administration had decided until recently to keep the U.S. in Treaty compliance. The Administration now plans to deploy cruise missiles on U.S. B-52 strategic bombers in late 1986 which would be in violation of the SALT II Treaty.

Another critique, espoused by Magnus Clarke, sees arms control so far behind technology that "the complete abandonment of the arms control process, as it exists, and consequent total de-regulation of the superpower arms race in all its aspects may now be the more appropriate policy. To continue in the pursuit of arms control . . . is to ignore avenues which offer more promise to the goal of security".[23] A number of other arms control critics, including Reagan Administration officials, go beyond these conclusions and argue that arms control has in fact had a negative effect on U.S. national security.

These critiques are neither accepted by the entire policy community

nor by the Congress. The Congress continues to urge the President to seek arms agreements and has tied its support of major weapons programs to such efforts by the Administration. In addition, U.S. NATO partners have strongly backed the arms control process. The deployment of new U.S. intermediate-range nuclear weapons (INF) in Europe was tied to the so-called 'two-tracked' approach in which the European governments would support INF deployments so long as the U.S. sought an arms agreement on these weapons at the same time. The NATO allies are sensitive to any suggestion that the U.S. abandon its nuclear umbrella as well as existing treaties or the arms control process. While the European governments wish to encourage efforts such as the SDI that may lead to increased security, they are fearful that current U.S. efforts outside of an arms agreement may de-couple U.S. and NATO security. These governments are likely to pressure the U.S. to seek an arms agreement on offensive forces before the U.S. can begin deploying a missile defense. In addition, any anti-tactical ballistic missile defense (ATBM) designed for NATO is likely to be accompanied by great pressure in the arms control arena as Soviet offensive weapons related efforts to counter a defense would agitate the Europeans.

Kenneth Adelman, Director of the Arms Control and Disarmament Agency for the Reagan Administration, has criticized the arms control process from another perspective reminiscent of the early theorists. Adelman argues that the arms control process has become overly political and a process in which the U.S. has not played very well. Adelman has argued that the U.S. "changes its positions on arms control so often that the Soviets can take pleasure in the expectation that if they stand

pat, the U.S will negotiate with itself and probably change its position as a result".[24] Arms control took on an "extraordinarily symbolic importance in U.S. political life" for both domestic reasons as well as concerns over U.S. relations with its allies.[25] President Reagan had stood firm on certain arms control positions for most of his first term but has now shown himself to be more flexible, in part, due to pressures to include arms control in his Administration's deterrence policies. That is, Reagan increasingly has sought to portray arms control as an important link in the future of the nuclear balance as well as the role of strategic defenses. These pressures have been generated by the Congress as well as U.S. allies. Adelman's argument, along with the critique that arms control has been unable to account for the differences in Soviet and U.S. strategic policy and objectives, is central to the Reagan Administration's position.

Strategic missile defenses run against the central tenets of existing arms control treaties which purport to regulate the strategic nuclear balance by confining the arms competition to the offensive arena. The decision to rely on offensive deterrence rests with the realization that defenses could not prevent an enemy from causing unacceptable damage to the United States. The U.S. has basically dismantled its defenses against a nuclear attack and has, in turn, sought to preserve its security through a policy of retaliation and arms control agreements. For example, the U.S. dismantled its surface-to-air missile network, has allowed its air defense interceptor force to dwindle, and mothballed all but the radars of the Safeguard ABM defense system constructed in the early 1970s. A shift in favor of strategic

defenses could overturn a number of the strategic assumptions upon which the current nuclear balance rests and the arms control policies proposed for much of the past twenty years. To the extent that the future of arms control is tied to the traditional strategic concepts, namely offensive dominance, national vulnerability, and strategic stability through invulnerable offensive forces, it is likely to find little room within a U.S. deterrence theory dominated by strategic defenses.

While not exhaustive, Clarke has identified "two principle factors" which he concludes "have been held to threaten the stability of the deterrent relationship" between the superpowers.[26] The first is the possession of a first strike disarming capability and the second is the possession of an effective defense.[27] Both would weaken the assurance that an enemy was deterred from launching a nuclear attack and are generally attributable to assured destruction theory and policies. Arms control, in this context, has been associated as a means for preventing the emergence of destabilizing efforts by the superpowers. That is, arms control has served to restrain those activities deemed most likely to destabilize the nuclear balance as well as those most easily verified. However, "the reality of the central deterrent relationship has diverged from both deterrence theory and the arms control image".[28] Both the United States and the Soviet Union have sought to procure counterforce capable weapons which could give them a limited first strike capability and as such limited defense capabilities when used in a damage limitation mode. Constraint on counterforce weapons has been relatively unsuccessful as the accuracy of ballistic missiles has improved and the superpowers have deployed thousands of warheads on

MIRVed ballistic missiles. The arms control process has contributed to the relative success of constraining the development of an effective defense by the superpowers. However, the march of technology is currently pressing the credibility of the arms control argeements which regulate this arena.

Much of the preceeding discussion appears to portray arms control as a weakening element of U.S. deterrence policy. Existing treaties are increasingly under pressure from arms control critics and are being challenged, in part, by the strategic defense initiative. The arms control regime and enterprise is being critiqued for undermining U.S. security rather than providing for it. However, the Reagan Administration believes "the pursuit of the SDI and equitable and verifiable arms control agreements are not mutually exclusive, in fact, they 'may be' mutually supportive".[29] The question remains: What is likely to be the future of arms control as the U.S seeks to implement a defense deterrence doctrine, policy, and force structure?

Secretary of Defense Weinberger has argued that arms control can serve U.S. national security interests as one component of the U.S.'s larger national security policy but not as an isolated objective or independent instrument.[30] As such, Weinberger believes that the U.S. only can achieve effective arms agreements when negotiating from strength. For example, the Reagan Administration has touted the argument that the SDI has brought the Soviets back to the bargaining table and will further lead to greater flexibility on the part of the Soviets. In addition, the Reagan Administration has made the reduction in numbers of weapons (measured by their effectiveness) the primary

concern for an arms agreement. The combination of these points -- strengthening U.S. forces and reductions in forces -- has made arms control a more difficult enterprise under this Administration.

There has emerged an interesting discussion among SDI proponents concerning arms control from the critically minded to those who favor arms control in some fashion and see important options emerging as a result of the strategic defense initiative. As such, the SDI could be the greatest impetus to arms control or the greatest barrier. While the Soviets have been adament about an agreement on the SDI which indicates eventual difficulty in reaching any agreements, they are back at the negotiating tables and desperatly want to reach some agreement. The lesson of these developments for Administration hard-liners is to hold fast on the SDI in Geneva while moderates see the SDI as a critical negotiating card to obtain meaningful offensive reductions. A number of arms control critics, such as the Heritage Foundation, foresee little if any role for arms control and have urged the Administration to abandon U.S. Treaty obligations. Other strategic defense proponents, including President Reagan, forsee an important role emerging for arms agreements in a nuclear balance which includes controlled defensive deployments. Hence, arms control could range from unhindered defenses and no arms control to offensive arms limits and no defense. Between these two extremes there could be various combinations for mutual offensive cuts and restraints on defensive deployments.

A number of critics believe the Reagan Administration is insincere about arms control. As outlined above, the SDI could require a major shift in the traditional U.S. approach toward arms control. The

President has stated that arms control is not dead and that it is important to the implementation of a defense dominated balance. In this regard, the superpowers have agreed to a three subject arms control approach in Geneva. The first meetings held in March 1985 divided the agenda into strategic intercontinental weapons, intermediate-range nuclear weapons, and space-based weapons systems. Adelman announced in January 1985 that the U.S. goal with respect to the arms control talks on space systems would be "to explain to the Soviets that over time, the more defense-oriented deterrents could lead to a situation where the peace was not resting on the threat of mutual annihilation".[31] That is, the Reagan team believes that strategic missile defenses eventually can be developed and deployed in an arms control context. Reagan has stated that the U.S. would be willing to share defense technology with the Soviets if they were to agree to an arms control accord that called for mutual deployments of ballistic missile defenses. The Administration effectively is seeking to preclude any agreement that would constrain the SDI research program during its current phase and leave open to discussion agreements on later phases.

A cornerstone of the Reagan Administration's arms control policy to date has been a proposal to reduce the size of the offensive land based forces of the superpowers. Since his strategic defense speech, Reagan has emphasized the need for offensive arms reductions as a part of a defense deployment process. The Administration recognizes the threat of a simultaneous offensive and defensive arms race should the Soviets seek to overcome a U.S. missile defense by employing offensive countermeasures to include an increase in the size of their offensive

nuclear arsenal. The Soviets, for their part, have stated that offensive arms reductions are possible if the U.S. is willing to constrain the SDI by a treaty. However, the Reagan Administration has said that the SDI is not negotiable. The Administration appears to have every intent to continue the research and development phases of the SDI with or without an arms control agreement.

While there may be room in the Reagan Administration's position for agreements on later stages to include a transitional deployment, it has not been revealed as yet. Weinberger has argued, in this regard, that the pursuit of defensive deterrence by the superpowers may provide the Soviets with a reason to consider offensive reductions. The Administration's optimism may not be well thought out as Soviet and domestic objections could act as powerful obstacles to defense deployments. A number of SDI critics have argued that the Reagan Administration actually wishes to force the Soviets into an offensive arms reduction accord by deploying a U.S. missile defense. Former Secretary of Defense Brown has responded to this idea by arguing that "deployment of a U.S. missile defense . . . to gain arms reductions fails on logic. U.S. MIRVs may have produced the ABM Treaty but it is difficult to see how U.S. ABMs will produce constraint on Soviet MIRVs".[32] If the U.S. continues to insist that the SDI is non-negotiable, there is unlikely to be any arms control agreements on strategic offensive and defensive forces at all. Moderates in Washington are hoping that the Soviets will accept deep offensive cuts in returen for some restraint on the SDI. The Office of Technology Assessment concluded that this would be a logical choice as limited

defenses are feasible only against reduced numbers of offensive forces, but that area defenses would not work.

A number of arms control advocates have suggested that the SDI can serve as a bargaining chip, much as the original U.S. ABM program eventually served, to encourage Soviet flexibility in Geneva on an offensive arms control accord. Critics claim that failure to negotiate on SDI risks provoking a similar Soviet strategic defense effort and thereby an escalation in the arms race. The Reagan Administration has reacted, in part to these charges as well as to justify the SDI, by publishing its account of Soviet violations of existing treaties and by documenting existing Soviet strategic defense programs. As such, the Reagan Administration is seemingly placing the SDI in the context of 'reprisals' for breach of Treaty obligations by a second party. In this case, the Administration my have some justification for calling the SDI legal in response to specific Soviet violations of the ABM Treaty, namely the construction of large phased-array, early warning radar at Krasnoyarsk.[33]

President Reagan has suggested that the U.S consider discussing a sharing and coordinated deployment of ballistic missile defenses with the Soviets. In this regard, "the President . . . is known to believe that unilateral deployment by the U.S. would be destabilizing. The Soviets would be convinced that the U.S. was interested in developing a first strike capability and might respond with a pre-emptive strike of their own."[34] The Administration may believe it can pressure the Soviets into an offensive arms control accord and then establish an agreement on phased defense deployments. However, the Administration

has not proposed publicly an arms control agenda that would achieve these ends. Confusion persists due to conflicting reports that the Administration is inflexible on the SDI program while also putting out feelers and hints of flexibility. This pattern of activity is often associated with the first stages of a new arms control negotiating round. In addition, the Administration does not want to bind the defense program before it has provided enough answers to the question of defense feasibility. In August 1985, Secretary of State Shultz informed the Soviet Union that the U.S. might revise its plans to deploy a strategic defense if the Soviets were willing to agree on significant offensive arms reductions.[35] This announcement may represent the first look at a U.S. arms control position relative to defense weapons. In fact, the U.S. may ultimately seek to obtain agreements on a mix of deep cuts in offensive forces and allow some strategic defenses. This avenue migh be far more effective in enhancing deterrence and stabilizing the strategic balance.

What are the arms control options available to the U.S. should it decide to proceed with a strategic missile defense? George Keyworth, science advisor to President Reagan, has outlined three goals for arms control in the context of the SDI. He argues that arms control, to be effective in promoting U.S. security must reduce the risks of nuclear war, reduce the level of arms, and lessen the consequences of war.[36] The Reagan Administration may attempt to achieve these goals in a number of ways. As described above, the Administration has argued that it would like to conclude an offensive arms control agreement which, in turn, might provide the basis for an eventual BMD deployment. While it

is not inconceivable that the Soviets would agree to an arms control treaty that cuts offensive arms and provides for scheduled defense deployments, the Soviets would currently prefer to maintain an offensive balance of power. The Soviet Union, unlike the U.S., maintains the majority of its nuclear capability on land-based ICBMs. These weapons are likely to be the first target of a U.S. defense. Hence, the Soviets would appear to have more to lose by agreeing to this kind of accord than by opposing it.

The resolution of these conflicting positions -- SDI's most advantageous role in arms control -- is dependent on a number of other issues.[37] First, the technical feasibility of a missile defense will directly constrain the positions the U.S. can advocate in an arms control regime. For example, should traditional ABM interceptors prove feasible while more exotic defenses do not, the U.S. may seek modifications to existing treaties rather than scrapping them. Second, the overall military/political implications of a U.S. BMD for the superpowers' nuclear arsenals and the stability of the strategic balance will have to be considered critically before advancing a defined arms control position. That is, the benefits of a U.S. BMD may not outweigh the continued or enhanced benefits of maintaining and strengthening arms control. Finally, the options for arms control available to the U.S. will influence the U.S.'s decisions as to its future arms control approach.

A more detailed example of the offensive reduction and defensive deployment scheme has been labelled a 'defense protected builddown' (DPB). The proposal calls for a phased introduction of strategic

defenses where initial defenses would be deployed to protect retaliatory forces thereby reenforcing offensive deterrence. Later phases would be structured to include reductions in offensive forces and deployment of more capable defenses around a greater number of targets.[38] While the defense problem might be made easier in an offensive builddown environment, it would not automatically mean the deployment of defenses was a wise decision for U.S. security.

Nitze's defense criteria may only be met somewhat more easily in an offensive reduced world.[39] A defense is still likely to have a number of inherent technical limitations and flaws, such as command-control-communication linkage problems, in addition to difficulty handling remaining Soviet penaided offensive forces. Secondly, the cost savings associated with reduced offensive forces are unlikely to compensate entirely for expenditures toward a defense. Finally, fitting the defense deployments into an arms control framework in order to maintain stability in a manner acceptable to the superpowers is a major task.[40]

An additional arms control option to constructing a new agreement could involve the Standing Consultative Commission (SCC). The Commission is not well known but has been critically important to the arms control regime for the past decade and a half. The Commission, established during the SALT I accords, can consider compliance questions, changes to the strategic balance that may bear on Treaty provisions, measures to increase the viability of existing agreements including amendments, as well as proposals for limiting strategic weapons.[41] The SCC has had success in clarifying provisions of the ABM

Treaty and could prove useful in clarifying interpretations of key provisions of the Treaty bearing on the strategic defense initiative program. However, the SCC's effectiveness in this regard is dependent on the attitudes of the superpowers regarding the overall value of arms control advocates. The SCC could prove useful to achieving less formal arms agreements as suggested by ACDA Director Adelman and may avoid some of the domestic political arms control pitfalls and barriers normally accompanying the more formal arms control negotiating process.

II. Defense and Existing Arms Control Treaties

The U.S. and Soviet Union have entered into a number of arms control agreements over the past two and a half decades of which three have an impact on the current and future character of the strategic defense initiative and any possible U.S. strategic defense system. These treaties are: the 1963 Multilateral Limited Test Ban Treaty, the 1967 Multilateral Outer Space Treaty, and the 1972 ABM Treaty and its amendments of 1974. Should the U.S. decide to move beyond its present defense technology research program as defined by the SDI to the full development of ballistic missile defenses or to expand the scope of its technology test programs, it could begin to bump up against limitations on these activities as established by these Treaties. Each of the Treaties place specific as well as general controls and limits on various aspects of strategic defense technology (ie. mobile ABMs are prohibited by the ABM Treaty), and/or the development and deployment of defense systems. President Reagan's SDI may require modification or

U.S. withdrawal from these Treaties if pursued beyond its present configuration.

These Treaties have been praised widely as concrete successes in the U.S.'s effort to establish rules in the strategic competition between the superpowers. Yet, the measure of their success is dependent on a number of factors including one's strategic perspective, the extent of change in the strategic balance over time, and the relative adherence by the signing parties to the Treaties' provisions. An additional point is that an arms control treaty serves as a "means, first and above all else, to reduce the risks of war and not as an end in itself".[42] That is, not all formal treaties serve or continue to serve the objective of reducing the risks of war and promoting U.S. national security. Neither an individual treaty nor the arms control regime can be considered sacrosanct.

A. Limited Test Ban Treaty

The 1963 Limited Test Ban Treaty was the first important Treaty to emerge in what might be termed the arms control era, roughly represented by the period from 1963 to 1979. This period represents the heyday of the 'traditional approach' to strategic arms control between the U.S. and Soviet Union. That approach came to be centered on efforts to confine the activities of the superpower competition to quantifiable and verifiable areas. The Limited Test Ban Treaty regulates the area in which nuclear tests can be conducted; in this case, the areas are the earth's atmosphere, outer space, and the oceans. The ABM Treaty and SALT accords regulate the numbers of launchers for ABM interceptors and

strategic nuclear weapons, respectively, that the superpowers can deploy. Generally, these regulated or 'controlled' areas can be verified by 'national technical means'.

In 1963, President Kennedy called the Limited Test Ban Treaty "an important step in man's effort to escape from the darkening prospects of more destruction and saw in its signing the prospects of detente between the two superpowers".[43] This enthusiasm for arms control has been embraced by every president since President Kennedy until the Reagan Administration. The political appeal of arms control can be recognized as these agreements can offer, according to Kruzel, "the double virtue of slowing the arms race and improving U.S.-Soviet relations".[44] Whether one believes that either the arms race has been slowed or superpower relations improved does not take away from the appeal of arms control. In fact, the Reagan Administration has embraced arms control in its effort to improve the superpowers' relations. The Administration also has raised the prospects of an arms agreement in a defense dominated strategic balance. However, the Administration has not been willing to discuss the possibility of limiting the SDI program in order to promote an arms agreement. The Soviet Union, on the other hand, has stated that is unwilling to agree to an arms control accord in other areas unless the SDI is included. The reasons for arms control's appeal and the commensurate expansion of its role in U.S. policy as well as its inability to fulfill all presidential dreams will be addressed further in later sections of this chapter.

The 1963 Limited Test Ban Treaty concluded a comprehensive ban on nuclear explosions in the atmosphere, in outer space, and under the

oceans. Although the initial focus of the SDI had been on non-nuclear defense technology and weapons systems, a number of defenses under consideration are configured to use nuclear weapons. The ABM systems of the late 1960s -- the Nike program and follow-on Sentinal and Safeguard ABMs -- employed nuclear warheads as their operative kill mechanisms against reentry vehicles. Currently, there are a few defense systems under investigation by the SDIO, such as Teller's nuclear pumped laser defense, that would be dependent on nuclear explosions in outer space to generate missile killing lasers.

The Test Ban Treaty precludes the testing of nuclear weapons in the atmosphere or in outer space, thereby preventing actual 'environmental' testing of these weapons. The Treaty would preclude the deployment of a nuclear explosion dependent defense if it were designed to be deployed in space. The future development or testing of this kind of system in an operational mode would entail a U.S. violation of the Treaty. Relative to these kinds of restrictions, President Reagan has stated that the SDI will not violate the provisions of any arms control treaty currently in force. However, research by the U.S. to develop an effective defense of the kind envisioned by the Reagan Administration may eventually require the violation of a number of treaty provisions.

B. Outer Space Treaty

A second treaty which will have some impact on the development or deployment of strategic defenses being explored by the SDIO is the 1967 Outer Space Treaty, formally called the Treaty of Principles Governing the Activities of States in the Exploration and Use of Outer Space,

including the Moon and other Celestial Bodies.[45] Article IV in the Treaty prohibits the stationing of nuclear weapons and other weapons of mass destruction in earth orbit. The Treaty also precludes the establishment of military bases, installations or fortifications, maneuvers, or weapons testing on celestial bodies. The objective of the Treaty was to ban the nuclear weaponization of space and preclude the deployment of weapons systems similar to a fractional orbital bombardment system (FOBS), essentially nuclear tipped orbital ballistic missiles. However, the Treaty failed to effectively ban FOBS and does not preclude the passing of nuclear armed ICBMs through space. The Treaty, as in the case of the Limited Test Ban Treaty, would limit to some extent the deployment of ballistic missile defenses stationed in space that employed nuclear weapons to destroy ballistic missiles. However, the interpretation of these restrictions is likely to be subject to debate between the superpowers.[46]

According to Thomas Beer, strategic defense systems, such as a directed energy weapon (DEW), which would draw their energy from a nuclear source can not be considered a 'nuclear weapon' since the nuclear component of the energy production source is not enough in itself to define it as a nuclear weapon.[47] Even though the specific technical components of Teller's nuclear pumped laser may not qualify it as a violation of the specific prohibitions of the Treaty, according to the previous interpretation, these weapons would clearly violate the spirit of the Treaty. Beer has concluded that the "relevance of the Treaty to the prevention of the militarization of space is marginal. It leaves loopholes for . . . military activities, such as the deployment

of . . . space-based BMD weapons."[48]

As alluded to in Chapter Four, the Soviet Union has charged that a U.S. strategic missile defense weapon system, namely those designed around lasers and particle beams, are offensive in nature and thus banned from space by the Outer Space Treaty. While these weapons may prove useful to an offensive strategy -- ie. a strategy that relied on a preemptive attack on Soviet forces -- in conjunction with current U.S. forces, they can not function as an offensive threat, per se. The only true offensive role U.S. missile defenses could play by themselves would be as anti-satellite weapons (ASAT). In an ASAT role, a U.S. laser defense or kinetic kill weapon might be able to destroy Soviet early warning and reconnaisance satellites as a precursor to a nuclear strike on the Soviet Union or as a means to enhance the survivability of a U.S. missile defense system prior to or during a war.

In addition, there is considerable concern about the survivability of a U.S. space-based missile defense. While hardening and overlapping deployments can enhance the system's survivability, the U.S. would have to ultimately consider some anti-countermeasure role for some of its defense assets. That is, the U.S. is likely to require ASAT dedicated platforms or defense systems with inherent self-defense capabilities against possible Soviet direct attack countermeasures. The issue of discriminating ASAT from missile defenses will be particularly difficult in an arms control agreement.

C. The ABM Treaty

The most important strategic arms control treaty to date is the

1972 Anti-Ballistic Missile Treaty.[49] The Treaty represented the formal expression of U.S. strategic nuclear deterrence thought of the early 1970s. The Treaty symbolizes the essence of the concept of mutual deterrence as enshrined by the mutual assured destruction doctrine and suggests a common understanding on the relationship between offensive and defensive weapons.[50] That is, "the Treaty reflected the contemporary predictions concerning probable trends in strategic forces" and was advanced, among other reasons, to help forestall the growth of the superpowers' offensive nuclear arsenals.[51] As such, the Treaty has served as the centerpiece of the arms control regime for the past decade and a half.

The Treaty, modified by protocol signed in 1974, provides for the deployment of an ABM system around the national capital or an ICBM launch field to include one hundred launchers and no more than one hundred ABM missiles. Both the U.S. and Soviet Union have deployed ABM defenses; the Soviets deployed the Galosh ABM system around Moscow and the U.S. deployed the Safeguard defense around a U.S. Minuteman field. While the Soviet Union has maintained its ABM system since the signing of the Treaty, the U.S. dismantled all but the system's radars in the mid-1970s.

The Treaty contains a number of provisions which prohibit or place restrictions on ABM activities and systems. Article V bans the 'development, testing, and deployment of ABM systems and components that are sea-based, air-based, space-based, or mobile land-based' and precludes deployment of launchers capable of multiple shots or rapid reload.[52] Article V represents the heart of the Treaty with respect to

the goals and scope of activities that can be undertaken by the Strategic Defense Initiative Organization. As such, any plans to move missile defense technology development into these restricted areas, such as actual system testing or to deployment, would violate the Treaty.

Most analysts would agree that the Reagan Administration intends to remain within the Treaty boundaries with respect to traditional ABM weapons development. That is, the development of land-based ABM interceptors, similar to those employed in the Safeguard system, are unlikely to require the violation of the Treaty for some time as this technology already has been proven feasible. In addition, the Treaty provides for the operation of an ABM research facility by both nations. However, there are a number of 'exotic' technologies under consideration by the SDIO that do not fall into the traditonal anti-ballistic missile interceptor category.

In anticipation of the development of advanced technologies, Agreed Statement D was attached to the Treaty to help with the handling of these weapons. Statement D stipulates that "the parties agree that in the event ABM systems based on other physical principles and including components capable of substituting for ABM interceptor missiles, ABM launchers, or ABM radars are created in the future, specific limitations on such systems and their components would be subject to discussion in accordance with Article XIII".[53] Until the Fall of 1985 the Reagan Administration's justification for certain SDI related testing was that they were too rudimentary or peripheral to be the kind barred by the Treaty.[54] However, this issue is now the subject of intense debate as the Reagan Administration has sought to define Treaty interpretation

such that additional testing beyond 1985 is much less restricted.

A Pentagon legal review of the negotiating records conducted in 1985 "concluded that the Soviet negotiators did not accept limits on testing and development of exotic space-based systems, although it had been a U.S. objective" during the negotiating process.[55] However, recent statements by officials involved in the Treaty negotiations also indicate that the U.S. sought to provide cover in the ABM Treaty for a land-based laser ABM defense then under consideration by the Department of Defense.[56] This basic conflict indicates the latitude of interpretation which the Reagan Administration feels it may need to continue strategic defense research and testing beyond its current status. It also indicates a desire on the part of the Administration to stay within the Treaty provisions while bringing up the question of Treaty compliance for debate domestically.

The interpretation of Article II, Article V, and Agreed Statement D poses the greatest threat to the viability of the ABM Treaty's continued control on ballistic missile defenses. It also may provide the 'loophole' through which the SDI may progress without running afoul of the Treaty and could either prevent or instigate a major political and strategic setback to arms control. In October 1985, Reagan Administration officials stated that the Administration's interpretation of the Treaty, precipitated by the Pentagon Report mentioned above, would "not prohibit the testing or development on new technologies such as kinetic or directed energy weapons".[57] Critics of the SDI, including former negotiator Gerard Smith, charged that this 'broad interpretation' would sound the death knell of the ABM Treaty. Smith's position is that

exotic defense weapons were banned in the development and deployment provisions of Article V and that Agreed Statement D was added to clarify the handling of exotic weapon systems and components.[58] The Administration later stated that it would adhere to the more restrictive interpretation while acknowledging that it is legally justified in applying the 'broad interpretation'.[59]

The debate has become more intense due, in part, to the fact that the Reagan Administration appears to have assaulted past Administrations' and their own interpretation of the Treaty. The U.S. Arms Control and Disarmament Agency's report to the U.S. Congress in 1982 applied the interpretation that the creation of space-based ABMs would be a breach of Treaty obligations, whereas the creation of new fixed land-based ABM technology would not.[60] In addition, a March 1985 report to Congress "did not offer a reinterpretation of Treaty limitations; rather, it argued that prospective tests were compatible with the Treaty because devices tested in space did not constitute full fledged substitutes for ABM systems or their components".[61]

The restrictive interpretation, with respect to the development of exotic defense weapons and as explained to the press, limits defense weapons testing in three ways: 1. Tests must be conducted at reduced power levels; 2. The development of defense system prototypes is prohibited; 3. Additional technical limits also apply such as a prohibition on automatic reloading.[62] The U.S.'s position was very similar to this interpretation in its 1985 Arms Control Impact Statement to Congress. According to the Statement, the Treaty allows research occurring in the laboratory and prohibits development and testing

occurring at later stages of work when field testing is initiated on either prototypes or a broad-based model.[63] The broad interpretation, as announced by National Security Advisor Robert McFarlane, would allow research involving new physical concepts as well as testing and development.[64] This interpretation also might allow the U.S. to conduct systems testing outside of the laboratory thereby providing more realistic assessments of operating limitations.

Much of this controversy revolves around the interpretation of the definition of key terms in Article V, namely 'current ABM systems or components'. These terms, as defined in Article II, include the technologies used in ABM defense systems developed at the time of the Treaty -- interceptor missiles, launchers, and radars.[65] Given this definition of an ABM system, debate centers on the handling of new defense weapons technology. Milton Smith pointed out that "nowhere in the ABM Treaty are lasers, particle beams, infrared sensors, or other types of new ABM technologies mentioned. The question therefore arises whether the ABM Treaty covers these new technologies."[66] Beer has added that "while the wording" currently "suggests that" advanced weapons "are included, the matter is . . . complicated by Agreed Statement D that . . . specific limitations on exotic systems and their components will be subject to consultations."[67] According to the Administration's broad interpretation, Article V does not apply to new defense technologies which are the central part of the SDI. Both Abraham Sofaer and Paul Nitze, arms control advisors to the Reagan Administration, defended this interpretation to the Congress. Sofaer's position is that Article II and V relate only to conventional ABM systems and not futuristic

systems.[68] The Administration also argues that Agreed Statement D only requires the U.S. and Soviet Union discuss the development and deployment of ABMs based on new technologies and that directed energy weapons fit this category and therefore can be developed. However, as Smith further points out, "while the Agreed Statement is somewhat ambiguous, the provision for discussion on 'specific limitations' on such systems implies an intention to include them within the general Treaty limitations. If the parties had intended for no limitations to apply to such systems they would not have needed to use the word 'specific'".[69] While the arguments for and against certain interpretations are equally compelling, the overall issue is, as C. Raja Mohan states, "only symptomatic of the larger crisis in nuclear arms control."[70]

In light of the restrictions placed upon BMD by the ABM Treaty the U.S. will be faced with a number of choices should it proceed with strategic defense development, testing, and deployment of a defense system. Although it is too early to know what a likely BMD system will look like should the U.S. deploy such a defense, there are three basic avenues which the U.S might follow from the current status of BMD development that would affect the ABM Treaty. The U.S. may decide to forgo a BMD deployment and only maintain an active defense research effort in order to hedge itself against a Soviet breakout, thereby, protecting the ABM Treaty as it currently stands. This approach has been widely advocated by such former government officials as Robert McNamara and Harold Brown who feel that the potential hazards in trying to achieve a BMD system include a vigorous arms race and a more

destabilized nuclear balance. However, they do agree that a defense research program of somewhat smaller size than the SDI program is a prudent course of action for the United States.

The second and third options open to the U.S. assume that the U.S will deploy either a limited counterforce defense or a broader countervalue defense as discussed in Chapter Two. The U.S may seek to deploy a limited defense for its strategic forces and/or other military assets and to do so by seeking minor modifications to the ABM Treaty. Modifications may include amendments to the deployable types and numbers of launchers and missiles and their deployment locations. The U.S. also may attempt a more comprehensive defense that would in all likelihood be seen as a 'breakout' from the ABM Treaty, be it gradual or radical, and would necessitate a major renegotiation or abrogation of the Treaty. White House spokesman Edward Djerejian has stated that the Administration believes "that . . . the day will come when we will have answered the questions necessary to consider going beyond the restrictions that we have" in the Treaty.[71] Presumably, the U.S. might attempt to renegotiate to allow for exotic defense deployment or simply notify the Soviets of a U.S. intention to withdraw from the Treaty.

Among the issues which the U.S. will be faced with by the early 1990s, when defense testing will likely require reversion to the broad interpretation, are a final resolution of the 'broad' and 'restrictive' interpretations of Article V and Agreed Statement D as well as a more precise definition of ABM components, launchers, missiles, and radars in Article II.[72] The Reagan Administration has already created the precedent of declaring it legally justifiable to use the 'broad'

interpretation but has declared its current intent to continue research under the restrictive interpretation. This issue raises a number of important questions. At what point will SDI research necessitate a move to the broad interpretation and what might be the results at that time? Whatever the outcome of the interpretation debate it is fairly clear that a violation of the Treaty will occur if a defense system is to be fully tested. A U.S. move to the broad interpretation is likely to lead to widespread condemnation by the Soviet Union, NATO allies, and domestic arms control advocates. In turn, the U.S.'s arms control position may be weakened as the Soviets could begin to use the broad interpretation to justify its own strategic defense program.

Another major problem that has plagued the arms control process in the past and is unlikely to recede anytime soon is compliance verification. An agreement that is not verifiable (can not be verified for technical or tactical reasons) is generally believed to be useless by the U.S. policy community. The U.S. has insisted on a number of mechanisms to achieve verifiability in an arms reduction proposal. However, the Soviets have been unwilling to accept a number of these proposals due in part to their internal security constraints.

A particular problem with respect to verification is the implication of cheating on an agreement. The threat posed by a nation that cheats is roughly equal to the size of the cheating. In the context of offensive arms reductions (ie. fifty percent), the danger of unaccounted and clandestinely deployed weapons may prove highly destabilizing. That is, the value of individual weapons is increased when the total number of weapons is reduced. For example, a Soviet

concealment program for an additional fifty SS-24 ICBMs above the limits allowed in a 50 percent reduced offensive balance would be seen as extremely serious by the United States. Fifty SS-24 ICBMs could carry 500 warheads and might be adequate to disarm half of the remaining U.S. land-based nuclear arsenal (i.e. where the U.S. has 500 Minuteman IIIs or some combination with the MX). While this kind of scenario is entirely hypothetical, it does provide insight into the issues the U.S. may face in a offensive reduced and defense deployed world.

The introduction of missile defenses may render the problems of arms control verification as presented in the scenario above less critical and thereby enhance the prospects for reaching an arms agreement. A missile defense system may be able to facilitate arms reductions by reducing the utility of offensive nuclear forces.[73] That is, the propensity to cheat on an arms reduction agreement may be reduced as the individual value of offensive weapons is degraded. Fifty clandestinely deployed weapons is unlikely to represent a significant threat to the defense capabilities of a U.S. missile defense. In addition, there might be more pressure on the Soviets not to cheat in order to prevent the U.S. from scrapping a treaty and deploying more offensive forces and defenses. The Soviets would need to deploy considerably more than fifty weapons to gain a meaningful increase in their offensive capabilities. The size of such a deployment is unlikely to go undetected by the U.S. intelligence community.

While a lessening of the verification requirements for offensive forces may emerge from the deployment of defenses, a requirement for defense verification may arise. For example, a mutual defense

deployment and offensive reduction agreement would require careful monitoring as one side may seek to achieve some advantages by deploying defenses more quickly and cutting offensives more slowly. Another problem is U.S. reliance on space-based reconnaissance satellites which could be threatened by missile defenses that are capable of an ASAT mission. Destruction or degradation of these assets could significantly lessen the U.S.'s capability to monitor any arms agreement.

The strategic defense initiative has instigated a much broader debate in U.S. policy circles concerning the future role of arms control in U.S. deterrence policy than was being conducted before. Arms control has played a key role for more than two decades and retains widespread support in the policy community, the Congress, the public, and with the U.S.'s NATO allies. While there are a number of strategic and political impediments to the conclusion of arms agreements, arms agreements have served to confine the superpower arms race to some weapons areas. Adam Garfinkle has characterized arms control's contribution to the strategic balance in the past and its possible future contribution as bringing both a sense of the limits to military competition and the seriousness of the matter. In effect, the superpowers have acknowledged that they will not push a military advantage to its limits.[74] This was clearly the case with the ABM Treaty when the U.S., ahead in the ABM technology at the time, accepted limits in return for limits on Soviet offensive forces. In addition, there are a number of equally compelling obstacles to the scrapping of the arms control process. The greatest success in this regard concerns defensive weapons with the signing of the ABM Treaty. The SDI and the defense/offensive deterrence debate, in

general, have challanged the very foundations upon which U.S. arms control policy has rested.

Endnotes Chapter 5

[1]"Study Urges New Direction for Arms Control," New York Times, 8 December 1985, p 24. Also see the Union of Concerned Scientists' Report The New Arms Race: Star Wars Weapons Briefing Paper 5, (Washington, D.C.: Union of Concerned Scientists, 1983).

[2]Andrew Alexander, "McNamara: Star Wars adds to arms race," Atlanta Constitution, 6 June 1985, p 24.

[3]Ibid.

[4]See Donald M. Snow, "BMD, SDI, and Future Policy: Issues and Prospects," Air University Review: (Spring 1986).

[5]Colin S. Gray, "A Case for Strategic Defense," Survival, 27 (March/April 1985): 54.

[6]Joseph Kruzel, "What's Wrong with the Traditional Approach?," Washington Quarterly, 8 (Spring 1985): 122.

[7]Ibid., 123.

[8]See Thomas C. Schelling and Morton H. Halperin, Strategy and Arms Control (New York: Twentieth Century Fund, 1969); Hedley Bull, The Control of the Arms Race: Disarmament and Arms Control in the Missile Age (New York: Praeger Publishers, for the International Institute for Strategic Studies, 1961).

[9]Kruzel, "What's Wrong with the Traditional Approach?," 123.

[10]Ibid.

[11]Ibid., 124.

[12]Ibid.

[13]Ibid.

[14]Ibid., 125.

[15]Ibid., 131.

[16]Magnus Clarke, "Nuclear Deterrence and the Strategic Defense Initiative," Arms Control, 6 (September 1985): 160.

[17]Steven E. Miller, "Politics Over Promise," International Security, 8 (Spring 1984): 68. See also Stephen M. Walt, "Why Clever Schemes Don't Work," Issues in Science and Technology (Winter 1986): 83-90, for a review of the international and domestic barriers to arms control agreements.

While his assessments are more theoretical than Steven Miller's, Walt provides some insignt into the complex factors that influence the arms control process and ultimately the nuclear balance.

[18]Ibid., 80.

[19]The politics of negotiations between the superpowers is not in and of itself a domestic impediment; however, the negotiating process does influence the basic positioning and positions of the domestic players.

[20]Ibid., 83.

[21]Ibid., 89.

[22]The ABM Treaty, U.S. Arms Control and Disarmament Agency, Arms Control and Disarmament Agreements: Texts and Histories of Negotiations, 1982 ed. (Washington, D.C.: Government Printing Office, 1982), pp. 139-47, 162-63.

[23]Magnus Clarke, "Nuclear Deterrence and the Strategic Defense Initiative," Arms Control, 6 (September 1985): 161.

[24]Kenneth L. Adelman, "Arms Control with and without Agreements," Foreign Affairs, 63 (Winter 1984/1985): 242.

[25]Kruzel, "What's Wrong with the Traditional Approach?," 127.

[26]Clarke, "Nuclear Deterrence and the Strategic Defense Initiative," 162.

[27]Ibid.

[28]Ibid.

[29]Richard Perle, "The SDI: Addressing Some Misconceptions," Journal of International Affairs, 39 (Summer 1985): 23.

[30]Caspar Weinberger, Address before the National Press Club, Washington, D.C., October 9, 1985.

[31]Bill Outlaw, "Star Wars may render nuclear bombs obsolete," Washington Times, 30 January, 1985, p 5.

[32]Harold Brown, "The Strategic Defense Initiative: Defense Systems and the Strategic Debate," Survival, 27 (March/April 1985): 62.

[33]Reprisals, an otherwise unlawful retaliatory act by one state against another, may be taken when the state against which the reprisal is directed has violated the international law. However, the U.S. announced the SDI prior to raising the issue of the Krasnoyarsk radar with the Standing Consultative Committee (SCC). International law requires that a violation must have occurred first before invoking a reprisal. In addition, a

reprisal must be proportionate to the violation. These factors would seem to hinder a U.S. case for supporting the SDI as a legal reprisal against the Soviet Treaty violations. Source: Martin Feinrider, "The Strategic Defense Initiative and International Law," The Fletcher Forum, 10 (Winter 1986): 29-30.

[34]Owen Ullman, "Reagan Aides believe 'Star Wars' will be key to an Arms Agreement," Phildelphia Inquirer, 17 February, 1985, p. 3.

[35]John P. Wallach, "Shultz proposes a trade to Soviets," Baltimore News American, 1 August, 1985, p 1.

[36]George A. Keyworth II, "The Case for Arms Control and the Strategic Defense Initiative," Arms Control Today, 15 (April 1985): 1.

[37]see Elizabeth Pond, "Star Wars and Arms Control," Christian Science Monitor, 6 February, 1986, p. 22.

[38]Snow, "BMD, SDI, and Future Policy: Issues and Prospects," 11.

[39]Paul Nitze announced what has come to be known as the 'defense criteria' during the Summer of 1985 which established three general criterion that a U.S. strategic missile defense must meet before being considered for deployment. They include - the system must be technically feasible; it must be economically feasible; and finally, it must be compatible with arms control.

[40]Snow, "BMD, SDI, and Future Policy: Issues and Prospects," 11.

[41]Sidney N. Graybeal and Michael Krepon, "SCC: neglected arms control tool," Bulletin of the Atomic Scientists, (November 1985): 30.

[42]Gray, "A Case for Strategic Defense," 50.

[43]Kruzel, "What's Wrong with the Traditional Approach?," 125.

[44]Ibid.

[45]See Status of Multilateral Arms Regulations and Disarmament Agreements, Ed. by the United Nations Department for Disarmament Affairs, 2nd Edition, 1983. p 32.

[46]The Reagan Administration's Arms Control Statement for 1985 described the Treaty's provisions as 'establishing a general norm for peaceful uses of outer space'. However, while this allows for 'passive' military missions such as reconnaissance satellites, defensive platforms would violate this norm. See Martin Feinrider, "The Strategic Defense Initiative and International Law," The Fletcher Forum, 10 (Winter 1986): 19-32. Also see Fiscal Year 1985 Arms Control Impact Statement, 98th Congress, 2nd Session 294, 1984 (Washington, D.C.: U.S. Government Printing Office, 1984).

[47]Thomas Beer, "Arms Control in Outer Space-Military Technology vs. International Law," Arms Control, 6 (September 1985): 193.

[48]Ibid., 194.

[49]Refer to APPENDIX C for the full text of the ABM Treaty.

[50]C. Raja Mohan, "The ABM Treaty Under Pressure," Strategic Analysis, December 1985: 907.

[51]Gray, "A Case for Strategic Defense," 50.

[52]The ABM Treaty, U.S. Arms Control and Disarmament Agency, Arms Control and Disarment Agreements: Texts and Histories of Negotiations, 1982 ed. (Washington, D.C.: U.S. Government Printing Office, 1982), pp. 139-47, 162-63.

[53]Refer to APPENDIX C for the full text of the ABM Treaty.

[54]Dan Oberdorfer, "Reagan Claims Star Wars Progress does not violate terms of ABM Pact," Washington Post, 13 October, 1985: p. 11.

[55]Ibid.

[56]John J. Fialka, "Reagan Team Justifies Star Wars Plan by claiming loophole in ABM Teaty," Wall Street Journal, 22 October 1985, p. 64.

[57]Orrin G. Hatch, "A Sideshow over the ABM Treaty," Washington Times, 31 October 1985, p. 1.

[58]see Gerard C. Smith, "Star Wars is Still the Problem," Arms Control Today, 16 (March 1986): 3 - 6 for a review of his critique of the SDI program.

[59]Secretary of State George Shultz announced the Administration's commitment to the 'strict' interpretation of the ABM Treaty in mid-October 1985 after the President had signed a National Security Directive to that effect. George P. Shultz, "Arms Control, Strategic Stability, and Global Security," Department of State, Bureau of Public Affairs, Current Policy no. 750; Department of State Press Release no. 244, October 17, 1985, Press Conference by the Honorable George P. Shultz Secretary of State at NATO Headquarters, Brussels, Belgium, October 15, 1985.

[60]Jozef Goldblat, "New Means of Ballistic Missile Defense: The Question of Legality and Arms Control Implications," Arms Control, 5 (September 1984): 177. Also see Fiscal Year 1983 Arms Control Impact Statements (Washington, D.C.: U.S. Government Printing Office, 1982) for a review of the U.S. government's then current interpretation of Treaties it is party to.

[61]Michael krepon, "Dormant Threat to the ABM Treaty," Bulletin of the Atomic Scientists, 42 (January 1986): 31. Also see U.S. Department of

Defense, "Report to the Congress on the Strategic Defense Initiative," (Washington, D.C.: U.S. Government Printing Office, 1985): Appendix b.

[62]Hatch, "A Sideshow over the ABM Treaty," 1.

[63]See Fiscal Year 1985 Arms Control Impact Statement, 98th Congress, 2nd session 294, 1984, (Washington, D.C.: U.S. Government Printing Office, 1984).

[64]Krepon, "Dormant Threat to the ABM Treaty," 31.

[65]Hatch, "A Sideshow over the ABM Treaty," 1.

[66]Milton L. Smith, "Legal Implications of a Space-Based Ballistic Missile Defense," California Western International Law Journal, 15 (Winter 1985): 10.

[67]Beer, "Arms Control in Out Space-Military Technology vs. International Law," 195.

[68]Krepon, "Dormant Threat to the ABM Treaty," 31. Also see Abraham Sofaer and Paul Nitze, Statements before the Subcommittee on Arms control, International Security and Science of the House Foreign Affairs Committee 22 October, 1985.

[69]Smith, "Legal Implications of a Space-Based Ballistic Missile Defense," 11.

[70]Mohan, "The ABM Treaty Under Pressure," 907.

[71]Myran S. Waldman, "Reagan Says Program 'Legal" Long Island News Day, 18 October, 1985: p. 19.

[72]According to the Reagan Administration, SDI tests will not raise the compliance issue until the early 1990s when more direct testing of a prospective defense system's components will be required to proceed with the program. However, other reports place this time frame closer to the late 1980s. See U.S. Department of Defense "Report to the Congress on the Strategic Defense Initiative," (Washington, D.C.: U.S. Government Printing Office, 1985), B3; and John B. Rhinelander, "The Impact of U.S. and Soviet Ballistic Missile Defense Programs on the ABM Treaty," A Report for the National Campaign to Save the ABM Treaty, (March 1985), p. vi.

[73]Peppino A. Debiaso and Robert Soofer, "Strategic Defense: Rationale and Implications," Journal of Civil Defense, (August 1985): 14.

[74]Adam Garfinkle, "Obstacles & Optimism at Geneva," Orbis 29 (Summer 1985): 268-280.

CONCLUSIONS

"Removing the horror" and threat of a nuclear holocaust "is one of our highest priorities."[1] This phrase illustrates the fundamental objective of the Strategic Defense Initiative and the Reagan Administration's commitment to the program. Since Secretary of Defense Weinberger included this statement in the 1985 Report to Congress, the SDI research program has expanded greatly in size while the policy community has begun to seriously consider a nuclear balance in which ballistic missile defenses are integrated, indeed, in which they may be central.[2]

The concept of a defense against ballistic missiles is not new, as demonstrated by the Nike-Zeus, Sentinel, and Safeguard programs of the 1950s and 1960s. Only recently, however, has the U.S. considered the deployment of a ballistic missile defense as a means of bringing about the obsolesence of offensive nuclear missiles. While this idea does not equate to nuclear disarmament, it does raise the question of what will assure deterrence of a nuclear war in the future. The SDI incorporates the proposal that deterrence can be shifted from dependence on a policy for nuclear retaliation to a policy of strategic defense. Ultimately, these ideas foster a debate between deterrence as currently thought of -- threat of offensive punishment -- and deterrence as traditionally thought of -- strong defense and capable offensives. This debate has centered on the desirability and feasibility of a policy for retaliation

versus a policy for damage limitation. The SDI has inspired strategic theorists and policy makers to entertain the idea that preventing damage to U.S. strategic assets, including its population, is possible.

In order for the U.S. to develop and deploy a ballistic missile defense that would provide for a radical and meaningful shift in nuclear policy in favor of a defense, a number of significant obstacles and uncertainties will have to be overcome and resolved. The major technical obstacle centers on the development of yet unproven or undeveloped defense hardware and software. Major breakthroughs will have to be made in such areas as ballistic missile acquisition and tracking systems, battle management radars that can digest initial data inputs and provide effective responses to the missile threat in extremely time-constrained environments, and finally, kill mechanisms to include kinetic and directed energy weapons. While advances in each of these areas appear to have been made in the last three years, the technology in general is far too immature to support the development of a space-based countervalue (area wide or population) defense.

In addition to the major technological problems, uncertainty continues to exist as to the potential effectiveness of Soviet countermeasure programs. The Soviets have stated their intent to counter a U.S. BMD with offensive and defensive weapons designed to overwhelm, confuse, avoid, and possibly defeat a U.S. ballistic missile defense. These efforts have to be considered by U.S. weapons scientists and policy makers prior to a decision to go forward with a defensive system. Soviet countermeasures will require that a U.S. defense be redundant to avoid catastrophe should the Soviets seek to disable the

system by a direct attack or as a result of component failure. Any defensive system will need to be designed with sufficient flexibility to incorporate new technology as Soviet countermeasures become increasingly sophisticated. For example, a U.S. boost defense laser will have to operate under tighter time constraints and with greater accuracy and lethality in order to defeat a Soviet ballistic missile force fitted with fast booster rockets, hardened casings, and employed in cluster attacks.

An equally important obstacle to the development and deployment of a strategic defense is the growing policy debate as to the desirability of a strategic defense for U.S. security. That is, the development and deployment of a ballistic missile defense in a strategic defense role or otherwise will hinge on its implications for U.S. national security. Currently, U.S. security with respect to the nuclear threat rests on a mix of nuclear policies. The central focus of these policies -- assured destruction, countervailing, and war-fighting strategies -- is that the U.S. can respond to nuclear aggression with an equal, lesser, or greater nuclear retaliation. The emergence of a ballistic missile defense could profoundly alter the nature of these policies. In addition, U.S. national security has been intertwined with the arms control process for the past 25 years. The U.S. currently is bound by a number of treaties that would either come into direct conflict with a U.S. BMD or would appear politically and militarily useless in a defensive balance of power. For example, the ABM Treaty is likely to become an ineffective agreement should the U.S. or Soviet Union 'creep out' or 'breakout' from the Treaty's limits. These issues will create tremendous inertia on the

part of many within the defense policy community as decades of standard procedure is pushed aside.

Once a BMD which can provide area defense is designed, tested, and made essentially invulnerable to Soviet countermeasures (if possible), the U.S. could begin to adjust its current deterrence policy in favor of defense. That process may entail a re-alignment of U.S. nuclear forces toward the defensive and could include a dismantling of offensive weapons. However, much of this process will depend on another set of decisions which are more politically charged, namely arms control, as well as actions by the Soviet Union.

The Reagan Administration has stated that a U.S. BMD would not be deployed without some form of offensive arms control, unless Soviet actions were such that the U.S.'s vital national interests called for such a deployment, i.e. in the event of a Soviet 'breakout' from the ABM Treaty. A number of arms control experts and strategic analysts also have charged that a U.S. BMD deployment in the absence of an offensive arms control agreement would lead to a dangerous offensive/defensive arms race. In as much as the Reagan Administration believes this argument, arms control will continue to play an important role in the manner, timing, and scope of a U.S. BMD deployment.

The scenario spelled out above is theoretically logical; however, each step is dependent on the other and assumes that the U.S. can perfect a ballistic missile defense of the kind envisioned by President Reagan and that the Soviet Union will not create obstacles for a U.S. BMD that cannot be overcome. It also assumes that offensive countermeasures and offensive deterrence will not continue to play havoc

on a BMD, and finally, that the Soviets will agree to the U.S. vision of a defensive strategic balance. Having separated each of these components of President Reagan's vision from the other, and doing so in order to analyze them independently, a number of basic conclusions can be drawn. It must be remembered, however, that in the 'real' world of the SDI and the nuclear balance, it is impossible to separate each component as neatly as has been done on paper above. In addition, the SDI program is still too young and lacks overall definition as to preclude an exact critique. The program fails, according to Nevell Brown, to meet the criterion of scientific hypothesis that it must be testable.[3]

The SDI has amplified a long standing tension in the defense policy community. That tension revolves around the notion of deterrence policy: Is deterrence better served by the threat to punish an aggressor for his attack or by the capability to prevent an aggressor's attack from achieving its objectives? The extremes of these policies are fraught with problems. For example, the ultimate threat of punishment was symbolized and incorporated into the massive retaliation policy which would have resulted in hundreds of millions of civilian casualties once employed. However, there is no way to guarantee that a nuclear weapon will not be used and hence prevention of an aggressor's attack can never be assured without complete and verifiable nuclear disarmament at all levels of weaponry. Hence, a range of options and challenges remain. The policy community is faced with deciding how to deter a nuclear attack on the U.S. and its allies by a number of possible means. In the most basic sense, these include continued

reliance on offensive nuclear forces to deter a Soviet attack, a defense to deter an attack, or a combination of the two in addition to efforts in the arms control arena.

Given the uncertainties involved in perfecting a BMD and the years it may require to implement a strategic defense policy, it is likely that the U.S. will opt for some combination of the two deterrence mechanisms in the immediate future. However, that decision will hinge on a number of critical factors. Paul Nitze has established a set of criteria which when applied to the strategic defense debate make it easier to understand the requirements for changing U.S. deterrence policy. First, the effectiveness of a strategic defense is at best highly debatable today. However, the type of defense mission is central to addressing this issue. A counterforce defense similiar to the traditional ABM interceptor may prove highly effective in enhancing the survivability of U.S. strategic forces. The more exotic defenses potentially may prove effective but are subject to the pace of technological development in both the defensive and offensive arenas. Additionally, technological solutions to complex problems are not always forthcoming. The Soviet Union, while acknowledged to have caught up in strategic weapons technology in the 1980s, merely increased the numbers and size of its strategic forces in the 1960s and 1970s to compensate for U.S. technological advantages. The SDI "suffers from a ... defect, namely that it fosters the spread of a sort of neo-technological illusion that the problems of the present strategic situation can be resolved by the application of new, more sophisticated technology."[4]

Nitze also argued that a defense would have to prove cost

effective. That is, it would have to be cheaper to develop, procure, and maintain a defense system than to alter or build new offenses to circumvent the defense. The cost of building a BMD and related air defenses as well as civil defenses may prove so expensive as to preclude all but a small counterforce defense for U.S. strategic forces. Additionally, the cost of defending U.S. allies against tactical ballistic missiles could further weaken the cost/benefit equation against a defense. The ongoing additions to U.S. and Soviet offensive forces and weapons already developed or being explored -- advanced stealth bombers, air- and sea-launched cruise missiles, penetration aids for reentry vehicles, and ASAT weapons -- are only likely to enhance the position of offensive forces relative to defenses in the coming decades.

Finally, Nitze's criteria recognizes that technology alone can not solve the basic problems of the balance of power between the superpowers. Rather, as Nitze concluded, correcting these problems is essentially a political problem in which arms control has and can make an important contribution. While past arms control accords have been criticized more adamantly by the Reagan Administration than by any previous administration, they have imparted a degree of predictability into the strategic balance. A completely unrestrained arms race clearly is less stable and more dangerous. The costs of proceeding with BMD research and development in terms of achieving arms control accords are likely to increase in the coming decade and may in turn create pressures to place that research in an arms control framework. Additionally, a defense transition can not be accomplished without aggravating the strategic balance and thereby creating dangerous instabilities unless

offensive arms control is accounted for and the Soviets share some vision of a defensive balance of power.

The ABM of the 1960s proved to be less militarily useful to the U.S. than was originally thought. However, the ABM did prove tremendously useful in the political/military arena in helping to achieve the first offensive arms control accord. The ABM, among other equally compelling factors, also helped push the U.S. away from massive retaliation policy and toward assured destruction policy and acceptance of Soviet strategic equality. Technology had transformed U.S. strategic superiority into a more equal balance as a result of the development of the ICBM. Today, technology has raced ahead again and the continued viability of the policies of the 1960s and 1970s are subject to doubt. The arms race has continued and strategic forces, namely ICBMS, are increasingly vulnerable. The defensive weapons arena has re-emerged and presents a number of tremendous opportunities to change these vulnerabilities.

The decades ahead are likely to be a period of great strategic uncertainty stemming from new offensive weapons, the prospects of defensive systems, and the erosion of the arms control regime. The role which BMD will play in the strategic future is not only dependent on technology's influence, but also on factors such as the system's economic cost and the political and military risks associated with developing such a defense. As yet, it is impossible to judge the likelihood of the development of an effective strategic defense as envisioned by the Reagan Administration. However, there are currently a number of extremely problematical issues which limit the debate to the

laboratory as well as to the paper pads of the community of strategic analysts.

Endnotes Conclusion

[1]Caspar Weinberger, Annual Report to Congress Fiscal Year 1985, (Washington, D.C.; U.S. Government Printing Office, 1984), 7.

[2]Ibid. This report was the first to follow President Reagan's March 1983 speech announcing the strategic defense concept.

[3]Nevell Brown, "SDI: the cardinal questions," The World Today, (May 1986): 81.

[4]Stefano Silvestri, "Europe and President Reagan's Strategic Defense," The International Spectator, 20 (July-December 1985): 12.

POSTSCRIPT

This study has emphasized that the development of strategic nuclear policy is a complex process which is ladened by numerous obstacles to change. The SDI is not unique in this regard and faces a number of particularly critical challenges in the political and technological arenas aside from the strategic security problems.

Recent developments with respect to a number of these issues may shed some insight on the prospects for the success of the SDI.

The pressure on the Reagan Administration to account for arms control implications of the SDI program may be growing more acute. The Soviet Union has initiated a new set of arms control proposals which arms control advocates have called a good basis for an agreement. The Soviet Union has dropped their demand that the U.S. completely end the SDI program. They are currently proposing that the superpowers abide by the ABM Treaty for a period of 15 years during which the development and deployment of ballistic missile defenses would be banned. In trade for this re-commitment to the Treaty, which would allow for 'laboratory research' (a term which requires elaboration), the Soviet Union is proposing a sizeable (30% to 50%) cut in strategic offensive forces. This proposal sounds very familiar, in some respects, to the line of argument made by the U.S. in 1972 that the superpowers agree to constrain defenses in order to achieve offensive arms reductions. However, the Reagan Administration clearly would like to stall any

agreement on defenses in order to get the SDI far enough along to make some decision on the feasibility of a missile defense. If the Administration begins to show flexibility toward the Soviet proposal, it may imply the faint signs of a retreat on the strategic defense initiative.

Another issue gaining more attention recently is the issue of the program's cost. A recent report by the Johns Hopkins Foreign Policy Institute charges that a space-based defense would cost $770 billion to build and operate over a ten-year period. The SDIO continues to respond that these kinds of estimates of a BMD system's cost are exagerated and that the true costs cannot be estimated at present. While costs of this magnitude would compare roughly to what the Navy or Air Force would spend on weapons development and procurement for the same period, the initial research and development phase is being cut back by Congress thereby potentially hampering the development schedule.[1] The Assistant Director for Sensors Technology at the SDIO, Bill Fredericks, has stated that Congress's current cuts in the 1987 appropriation request (from 5.2 billion to 3.1 billion), could prevent the SDIO from conducting certain key technology demonstration tests and further hamper basic technology studies.[2] Congress's motivation in cutting the Administration's request is not strictly budgetary but relate to questions regarding the program's goals (counterforce versus countervalue defense). Resolution of this issue is dependent on the technological feasibility of a countervalue or counterforce defense as well as the relative contributions of the different defense models to U.S. national security. This debate already has shown signs of heating up within the

Administration as a number of officials such as Paul Nitze continue to emphasize the value of a more limited defense than that envisioned by the President.

The problem of defense versus offensive forces in a more general sense has been given a boost as the Pentagon has quietly laid the ground works for an air defense initiative. As such, the Department of Defense appears to be building support for a more general emphasis on the requirements for protecting the nation other than by a ballistic missile defense. However, the cost of procuring an effective national air defense could be staggering and therefore might be competitive with the SDI and other strategic programs.

the U.S.'s NATO allies generally have agreed to either participate formally in the SDI program or allow their high technology industry to compete for research work. Additionally, the European allies appear to have lessened their initial critiques of the SDI as an arms control liability as well as a conceptually flawed program. However, the Europeans have pressed the Reagan Administration to include the study of defenses applicable to the European theater which has a different set of strategic threats (namely hundreds of medium-range Soviet ballistic missiles within minutes of Western European targets). The feasibility of an anti-tactical ballistic missile (ATBM) only recently has been raised by SDIO program directors. The allies are fearful that failure by the U.S. to appreciate their concerns could lead to a de-coupling of NATO Europe from the United States' nuclear umbrella (which will have become defensive as opposed to the current offensive umbrella). Another plausible European fear could be a defense protected U.S. might feel

less constrained by Soviet military capabilities and thereby become more militarily active, in turn adding to the chances of war in Europe.

Finally, while political support at the executive levels of the U.S. government may wain after the Reagan Administration leaves, the SDI program has become the largest program in the Pentagon budget, with the MX ICBM, B1-b, and other programs falling behind. The SDI program is unlikely to be dismantled and, as a result of recent success in technology demonstrations, the U.S. may accept some strategic missile defenses into its weapons arsenal. While strategic nuclear policy is complex and resistant to change, and given that the U.S. has generally accepted offensive deterrence as a part of the matured Nuclear Era, the ballistic missile defense concept has proven itself to be endearing and, in the opinion of SDI proponents, potentially useful to U.S. deterrence policy.

Postscript Endnotes

[1]Fred Hiat, "SDI Estimates at $770 Billion," Washington Post, (July 23, 1986): 12.

[2]William Fredericks, conversation on SDI sensor program at Georgia Institute of Technology, July 29, 1986.

APPENDIX A

TABLE 9. U.S. STRATEGIC NUCLEAR FORCES: 1986

	DELIVERY SYSTEMS	WEAPON YIELDS	IOC	DEPLOYED
LAND BASED	Titan II	5-9mt	1961	17
	Minuteman II	1.2mt	1966	450
	Minuteman III	170/335kt	1970	550
			Subtotal	1017
SEA BASED	Poseidon C-3	40kt	1975	288
	Trident C-4	100kt	1980	360
			Subtotal	648
AIR BASED	B-52G	12 ALCM (200kt) or 20 bombs of various yields, up to 9mt	1959	167
	B-52H	16 ALCM	1961	96
	FB-111	2 SCRAMS (170kt)	1970	60
			Subtotal	323*
			Total	1988
NEW STRATEGIC WEAPONS	B1b	ALCM or bombs of various yields	1986	17 by Sept. 1986
	SLCM	200kt	1984	100**

Sources: "Strategic Nuclear forces of the United States and the U.S.S.R.," Arms Control Today, 15 (June 1985): 9.; James L. George, "Start and the Navy," Proceeding, 112 (April 1986): 35.

*130 ALCM equipped bombers are allowed by the SALT II Treaty.

**Estimated number of SLCMs that could have been deployed by 1986.

APPENDIX B

TABLE 10. SOVIET STRATEGIC NUCLEAR FORCES: 1986

	WEAPON	WARHEADS	DEPLOYED
LAND BASED			
	SS-11	1 - 3	448
	SS-13	1	60
	SS-17	4	150
	SS-18	10+	308
	SS-19	6	360
	SS-25	1	70
SEA BASED			
	SS-N-5	1	39
	SS-N-6	1 - 2	304
	SS-N-8	1	292
	SS-N-17	1	12
	SS-N-18	1 - 7	224
	SS-N-20	6 - 9	80
	SS-NX-23	10	32
AIR BASED			
	BISON	Bombs	30
	BEAR	Bombs and cruise missiles	150
	BADGER	Bombs	262
	BLINDER	Bombs	135
	BACKFIRE	Bombs and cruise missiles	270

Source: Soviet Military Power 1986, (Washington, D.C.: U.S. Government Printing Office, 1985).

APPENDIX C

THE ABM TREATY AND RELATED DOCUMENTS

Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems

The United States of America and the Union of Soviet Socialist Republics hereinafter referred to as the Parties,

Proceeding from the premise that nuclear war would have devastating consequences for all mankind,

Considering that effective measures to limit anti-ballistic missile systems would be a substantial factor in curbing the race in strategic offensive arms and would lead to a decrease in the risk of outbreak of war involving nuclear weapons,

Proceeding from the premise that the limitation of anti-ballistic missile systems, as well as certain agreed measures with respect to the limitation of strategic offensive arms, would contribute to the creation of more favorable conditions for further negotiations on limiting strategic arms,

Mindful of their obligations under Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons,

Declaring their intention to achieve at the earliest possible date the cessation of the nuclear arms race and to take effective measures toward reductions in strategic arms, nuclear disarmament, and general and complete disarmament,

Desiring to contribute to the relaxation of international tension and the strengthening of trust between States,

Have agreed as follows:

Article I

1. Each Party undertakes to limit anti-ballistic missile (ABM) systems and to adopt other measures in accordance with the provisions of this Treaty.

2. Each Party undertakes not to deploy ABM systems for a defense of the territory of its country and not to provide for such a defense, and not to deploy ABM systems for defense of individual region except as provided for in Article III of this Treaty.

Article II

1. For purpose of this Treaty an ABM system is a system to counter strategic ballistic missiles or their elements in flight trajectory, currently consisting of:

(a) ABM interceptor missiles, which are interceptor missiles constructed and deployed for an ABM role, or of a type tested in an ABM mode;

(b) ABM launchers, which are launchers constructed and deployed for launching ABM interceptor missiles; and

(c) ABM radars, which are radars constructed and deployed for an

ABM role, or of a type tested in an ABM mode.

2. The ABM system components listed in paragraph 1 of this Article include those which are:

(a) operational;
(b) under construction;
(c) undergoing testing;
(d) undergoing overhaul, repair or conversion; or
(e) mothballed.

Article III

Each Party undertakes not to deploy ABM systems or their components except that:

(a) within one ABM system deploment area having a radius of one hundred and fifty kilometers and centered on the Party's national capital, a Party may deploy; (1) no more than one hundred ABM launchers and no more than one hundred ABm interceptor missiles at launch sites, and (2) ABm radars within no more than six ABM radar complexes, the area of each complex bieng circular and having a diameter of no more than three kilometers; and

(b) within one ABM system deployment area having a radius of one hundred and fifty kilometers and containing ICBM silo launchers, a Party may deploy; (1) no more than one hundred ABM launchers and no more than on hundred ABM interceptor missiles at launch sites, (2) two large phased-array ABM radars comparable in potential to corresponding ABm radrs operations or under construction on the date of the signature of the Treaty in an ABM system deployment area containing ICBM silo launchers, and (3) no more than eighteen ABM radars each having a potential less than the potential of the smaller of the above-mentioned two large phased-array ABM radars.

Article IV

The limitations provided for in Article III shall not apply to ABM system or their components used for development or testing, and located within current or additionally agreed test ranges. Each Party may have no more than a total of fifteen ABm launchers at test ranges.

Article V

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

2. Each Party undertakes not to develop, test, or deploy ABm launchers for launching more than one ABM interceptor missile at a time from each launcher, not to modify deployed launchers to provide them with such a capability, not to develop, test, or deploy automatic or semi-automatic or other similar systems for rapid reload of ABM launchers.

Article VI

To enhance assurance of the effectiveness of the limitations on ABM

systems and their components provided by the Treaty, each Party undertakes:

(a) not to give missiles, launchers, or radars, other than ABM interceptor missiles, ABM launchers, or ABM radars capabilities to counter strategic ballistic missiles or their elements in flight trajectory, and not to test then in an ABM mode; and

(b) not to deploy in the future radars for early warning of strategic ballistic missile attack except at locations along the periphery of its national territory and oriented outward.

Article VII

Subject to the provisions of the Treaty, modernization and replacement of ABM systems or their components may be carried out.

Article VIII

ABM systems or their components in excess of the numbers or outside the areas specified in this Treaty, as well as ABM systems or their components prohibited by this Treaty, shall be destroyed or dismantled under agree procedures within the shortest possible agreed period of time.

Article IX

To assure the viability and effectiveness of the Treaty, each Party undertakes not to transfer to other States, and not to deploy ouside iots national territory ABM systems or their components limited by this Treaty.

Article X

Each Party undertakes not to assume any international obligations which would conflict with this Treaty.

Article XI

The Parties undertake to continue active negotiations for limitations on strategic offensive arms.

Article XII

1. For the purpose of providing assurance of compliance with the provisions of this Treaty, each Party shall use national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law.

2. Each Party undertakes not to interfere with the national technical means of verification of the other Party operating in accordance with paragraph 1 of this Article.

3. Each Party undertakes not to use deliberate concealment measures which impede verfication by national technical measn of compliance with the provisions of this Treaty. This obligation shall not require changes in current construction, assembly, conversion, or overhaul practices.

Article XIII

1. To promote the objectives and impliementation of this provisions of this Treaty, the Parties shall establish promptly a Standing Consultative Commission, within the framework of which they will:

(a) consider questions concerning compliance with the obligations assumed and related situations which may be considered ambiguous;

(b) provide on a voluntary basis such information as either Party considers necessary to assure confidence in compliance with the obligations assumed;

(c) consider questions involving unintended interference with national technical means of verification;

(d) consider possible changes in the strategic situation which have a bearing on the provisions of this Treaty;

(e) agree upon procedures and dates for destruction or dismantling of ABM systems or their components in cases provided for the provisions of this Treaty;

(f) consider, as appropriate, possible proposals for further increasing the viability of this Treaty; including proposals for amendments in accordance with the provisions of this Treaty;

(g) consider, as appropriate, proposals for further measures aimed at limiting strategic arms.

2. The Parties through consultation shall establish, and may amend as appropriate, Regulations for the Standing Consultative Commission governing procedures, composition and other relevant matters.

Article XIV

1. Each Party may propose amendments to this Treaty. Agreed Amendments shall enter into force in accordance with the procedures governing the entry into force of this Treaty.

2. Five years after entry into force of this Treaty, and at five-year intervals thereafter, the Parties shall together conduct a review of this Treaty.

Article XV

1. This Treaty shall be of unlimited duration.

2. Each Party shall, in exercising its national sovereignty, have the right to withdraw from this Treaty if it decides that extradordinary events related to the subject matter of this Treaty have jeopardized its supreme interests. It shall give notice of its decision to the other Party six months prior to withdrawal from the Treaty. Such notive shall include a statement of the extraordinary events the notifying Party regards as having jeopardized its supreme interests.

Article XVI

1. This Treaty Shall be subject to ratification in accordance with the constitutional procedures of each Party. The Treaty shall enter into force on the day of the exchange of instruments of ratification.

2. This Treaty shall be registered pursuant to Article 102 of the Charter of the United Nations.

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