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UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY

WASHINGTON

OFFICE OF
THE DIRECTOR

May 30, 1969

MEMORANDUM FOR MR. HENRY A. KISSINGER
THE WHITE HOUSE

Subject: NSSM-28 Report

Forwarded in response to NSSM-28, dated March 6, 1969, are 25 copies of the final report of the NSSM-28 interagency Steering Committee concerning preparation of the U.S. position for possible strategic arms limitations negotiations with the Soviet Union. The report has been agreed upon by all members of the Steering Committee, which consisted of representatives of the Secretary of State, Secretary of Defense, the Chairman, Joint Chiefs of Staff, the Director of Central Intelligence, the Chairman, Atomic Energy Commission, the Assistant to the President for National Security Affairs, the President's Science Adviser, and the Arms Control and Disarmament Agency.

Gerard Smith

Gerard Smith

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OUTLINE OF REPORT

ANNEXES

A. REPORT OF THE STRATEGIC ANALYSIS PANEL ~~(forwarded separately by DOD)~~

B. VERIFICATION OF POSSIBLE ALTERNATIVE OPTIONS FOR STRATEGIC ARMS LIMITATION TALKS

C. FOREIGN POLICY CONSIDERATIONS

D. SAFEGUARDS (still in preparation)

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This document consists of ____ pages.
Number 57 of 60 copies, Series A.

ACDA-3289

REPORT OF THE NSSM-28 WORKING GROUP

ON PREPARATION OF A U. S. POSITION

FOR STRATEGIC ARMS LIMITATION TALKS (SALT)

May 16, 1969

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PREPARATION OF THE U.S. POSITION ON
STRATEGIC ARMS LIMITATION NEGOTIATIONS
WITH THE SOVIET UNION

I. PURPOSE

To develop alternative options that should be considered in preparing a U.S. position for possible strategic arms limitations talks with the Soviet Union; to evaluate the strategic balance that would result; and to discuss possible Soviet responses to each option and likely U.S. counter-responses. The study includes not only a discussion of illustrative alternative strategic force restrictions packages which might provide the basis for a proposed agreement, but also a discussion of the key issues with respect to each component of strategic forces, in order to provide a sound analytical base for tailoring possible new force restrictions packages which may be preferable to any of those evaluated herein.

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II. BACKGROUND

On January 27, 1967, following a series of discussions which dated back to January 1966, President Johnson sent a letter, along with an explanatory statement, to Chairman Kosygin proposing bilateral discussions on an understanding to limit the further deployment of "strategic offensive and defensive missile launchers." One month later, Foreign Minister Gromyko delivered to Ambassador Thompson, Chairman Kosygin's reply to the January 27 messages. Kosygin confirmed, in principle, Moscow's willingness to hold talks on limiting offensive and defensive missiles. President Johnson announced this understanding at a press conference on March 2, 1967.

In the months that followed, the United States urged the Soviets to agree to a prompt beginning of talks and indicated, in broad terms, the sort of agreement we had in mind. Thus, the Soviets were informed of three basic, though generalized, elements of our proposed negotiating position as it existed in 1967-68: (1) the agreement would involve a "leveling-off," not an outright freeze or a reduction, of strategic missile launchers, although reductions could be considered at a subsequent stage; (2) it would apply to launchers, not missiles (for purposes of simplifying verification); and (3) the United States is prepared to place "maximum reliance on national means of verification."

There is no ready and complete explanation of the Soviet stalling tactics during this period. One point seems clear, however: there was considerable opposition to the idea of the proposed talks within the Soviet Government, apparently centered around military authorities.

The first overt sign of a break in the Soviet attitude came in a speech delivered by Soviet First Deputy Foreign Minister Kuznetsov on April 26, 1968, before the United Nations General Assembly. There ensued exchanges of diplomatic correspondence, culminating in public announcements, made simultaneously in Washington and Moscow on July 1, that the two governments agreed "to enter in the nearest future into discussions on the limitation and reduction of both offensive strategic nuclear weapons delivery systems and systems of defense against ballistic missiles."

Following this agreement, diplomatic exchanges continued on setting a time, place and level of representation for the negotiations. In response to a United States query, the Soviet Union replied that it was prepared to begin talks in Geneva on September 30. However, this communication was delivered shortly before the Soviet invasion of Czechoslovakia and has never been answered formally by the United States.

An Executive Committee of the Committee of Principals was set up on July 7, 1968, for the purpose of preparing a U.S. negotiating position. In August, agreement was reached on three documents: a basic proposal (very similar to Option III set forth below), instructions to the delegation, and an opening statement by the delegation.

On January 15, 1969, the U.S. Government introduced in the North Atlantic Council (NAC), for comment by our Allies, a draft statement on "objectives and principles" of SALT which could be issued jointly with the Soviets as an interim measure, prior to the beginning of substantive negotiations. At the subsequent NAC discussion, in January 23, the U.S. in a sense drew back from this indication of intent, saying that the question of a possible agreement on "objectives and principles" would be reviewed by the U.S. Government in conjunction with a review of substantive aspects of SALT, and that we would inform NATO of the results of this study when completed.

Some of the language of the draft statement of "objectives and principles" was criticized by NATO Allies on the grounds that they implied a U.S.-Soviet intention to establish a "condominium." Our Allies did endorse, however, as they had done earlier, the initiation of substantive U.S.-Soviet negotiations. The same sentiment of support was expressed to President Nixon by European leaders during his recent tour of the Continent.

achieve others. In view of the very nature of the U.S.-Soviet competition to improve their relative strategic positions, actions by the U.S. to achieve forces capable of significantly reducing damage to itself in the event of war are likely to provoke a reaction by the USSR in order to maintain its deterrent capability. Thus, significant U.S. actions to limit damage to itself to a low level and provide a favorable war outcome may not be compatible with the objective of achieving and maintaining a stable strategic relationship over time. Some of the actions we might take to improve our damage limiting capability, both defensive and offensive, could also make preemptive attack less unattractive to the Soviets and increase the probability of war in a crisis. This is because a major effort to achieve forces to limit damage in the event of war could be interpreted by the other side as contributing to a first strike capability. Even in the absence of such forces there will always be some pressure in a crisis to impute the worst of motives to the other side. Once systems are deployed which could conceivably be interpreted as designed to make a first strike feasible, it becomes more likely that each side will assume the other might strike first. In a crisis, then, in which war seemed imminent, each side would be under considerable compulsion to strike first, although as long as prospective damage is high there will remain a strong deterrent to preemption, even in a crisis.

C. The Current Strategic Situation and Future Trends

1. Description of the Current Situation

a. Numerical Force Comparisons

Table I compares current U.S. and Soviet strategic forces. The projections of Soviet forces correspond to those in the latest National Intelligence Projections for Planning (NIPP), except that the ICBM and SLBM figures have been updated in the light of new information.

TABLE I

COMPARISON OF CURRENT STRATEGIC FORCES[1]
(End of FY 69)

	U.S.	Soviet
Offensive Forces		
Hard Intercontinental Ballistic Missile (ICBM) Launchers	1,054	904-914
Soft ICBM Launchers	0	142
Submarine-launched Ballistic Missile (SLBM) Launchers (SSBN)	656	204-220[2]
Intercontinental Bombers (Heavy)	581	140-150
Defensive Forces		
Anti-Ballistic Missile (ABM) Launchers	0	40-56
Air-Defense Interceptors	890	3,100-3,400
Surface-to-Air Missile (SAM) Launchers	2,112	6,750-10,215

See following page for footnotes.

1/ The categories of strategic weapons compared in this table are those shown in Table II-1 of the NSSM-3 report. The table excludes the following Soviet weapons systems which have a strategic delivery capability, either against the United States or against U.S. allies and U.S. forces in Europe: 673 IR/MRBM launchers, 348-364 launchers for submarine-launched cruise missiles (SLCMs) with a likely operational range of 250 nautical miles; 650-710 medium bombers and ASM carriers in the Soviet Long-Range Air Force; and 40-50 long range bomber/reconnaissance planes (BEARS) and 475-555 medium bomber/reconnaissance planes and ASM carriers in the Soviet Naval Air Forces. It excludes air tankers on both sides, of which the U.S. has over 600 and the Soviet Union 135-170 which could also be converted to bombers; tactical fighter/bombers on both sides, which could be used to deliver nuclear bombs on either side in Europe; and U.S. carrier attack aircraft which could be used in strikes on the Soviet Union. It also excludes 228-290 Soviet ICBM launchers and 208-256 SLBM launchers estimated to be under construction.

2/ Includes 78 launchers on G-Class diesel submarines.

b. Offensive Force Loadings

Indicators of force quality provide a better basis than force size for offensive force comparisons. For example, Table II compares representative force loadings of the U.S. and Soviet strategic offensive forces.

TABLE II

COMPARISON OF STRATEGIC OFFENSIVE FORCE LOADINGS[1]
(End of FY 69)

Basis of	ICBMs		SLBMs		Bombers (H)		Totals[4]	
Comparison	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Warheads[2]	1,065	1,182	512	104	2,629	219	4,206	1,505
Megatons (MT)	1,723	6,138	563	125	3,540	1,109	5,826	7,372
1-MT Equivalents[3]	1,275	2,232	537	114	2,716	489	4,528	2,835

[1]U.S. and Soviet force loadings for ICBMs, SLBMs, and heavy bombers reflect only those weapons which would be loaded for initial strikes by aircraft, operational and R&D ICBM launchers and on-line SLBMs, extracted from the Strategic Force and Effectiveness Tables. The Soviet force loadings for IR/MRBMs are high-NIPP operational and R&D launchers.

[2]Independently targetable warheads. Polaris A-3 considered as one warhead.

[3]The area of effects of nuclear warheads is not directly proportionate to their yield. For comparison purposes it is sometimes useful to reduce the total megatonnage of warhead stockpiles containing warheads of different yields to a common denominator of measurement of

III. GENERAL CONSIDERATIONS

A. Introduction

This section describes the present strategic situation, including a statement of strategic objectives and a brief comparison of U.S. and Soviet strategic capabilities, both taken largely from NSSM-3; notes the current direction of U.S. and Soviet strategic deployment activities, with some of their probable implications; outlines arms control objectives and principles and the relationship of arms control to strategic planning; discusses some of the problems related to arms control agreements, such as verification and safeguard arrangements; and enumerates the criteria against which the acceptability of various alternative arms control options have been evaluated in this study.

B. U.S. Strategic Objectives

1. The U.S. looks to its strategic forces to support a number of political-military objectives. The basic ones are listed below:

a. Deter and reduce the likelihood of deliberate attacks on the United States (and its allies).

b. Maintain stability in a crisis. (Deter and reduce the likelihood of a preemptive attack on the U.S.)

c. Limit damage to the United States (and its allies) in the event of a nuclear war.

d. Provide outcomes to the overall advantage of the United States in the event of a nuclear war.

e. Limit damage to the United States (and its allies) in the event of small (Nth power or accidental Soviet) nuclear attacks.

f. Achieve stability over time in the strategic relationship between the U.S. and the Soviet Union.

g. Respond to limited, and perhaps protracted, nuclear conflicts.

2. The current U.S. strategy emphasizes Objectives a and b above. The decision to deploy the Safeguard ABM system is an option intended to be a step toward achieving Objective e, and to aid in insuring our capability to achieve Objective a. The U.S. has not deployed forces designed primarily to pursue Objectives c and d directly with respect to the Soviet Union, but certain steps such as developing MIRVs, improving the accuracy of reentry vehicles, and deploying area ABMs are designed in part to serve these objectives. Objective f has not been attained because of the difficulty of stabilizing an unbalanced strategic force relationship when each side has the capability to try to improve its relative position, and when each side determines its force programs on the basis of conservative assumptions about the threat from the other side.

3. Since this study is directed toward development of a position which would seek to promote the national security by controlling strategic arms, as opposed to the NSSM-3 task of examining alternative strategies for deterring or fighting wars in a situation in which there are no agreed constraints, it may be noted that there are incompatibilities between certain of the listed objectives and the activities necessary to

effectiveness against urban industrial targets. The unit normally used for this purpose is the "one megaton equivalent," which permits expressing the capability of a stockpile of weapons of different yields as if they were all of one megaton weapons.

4/The figures shown in totals here would be changed by the inclusion of the weapons systems listed in the footnote to the previous table. The general relationship would be maintained, but the Soviet position would be significantly improved. The U.S. would still have an advantage in independently targetable warheads deliverable on the Soviet Union as opposed to Soviet warheads deliverable on the U.S., as well as a slight margin in 1-MT equivalents, although the Soviet Union would add to its current advantage in total megatonnage. It was not considered feasible to try to include the force loadings for those excluded delivery systems because of their different missions, and factors such as range and vulnerability which made it unrealistic to include them in a comparison with the systems shown. In addition, the Soviet ICBMs and SLBMs shown in the footnote to the previous table as under construction will not be available as of the end of FY 69.

c. Force Effectiveness

While the above force comparisons are important, they do not reflect the interactions between U.S./Soviet offensive and defensive forces that determine whether or not U.S. forces can meet current U.S. strategic objectives.

Currently, our basic strategic objective is to deter a Soviet attack on the United States and its allies. The key to meeting this retaliatory objective is our capability, and Soviet belief in our resolve, to destroy a large part of the Soviet population and industrial base after a surprise Soviet attack on the United States. In effect, we hold these Soviet resources hostage, to deter Soviet aggression against ourselves and our allies. Deterrence is not quantifiable in any definitive sense; however, one measure of the effectiveness of our strategic forces in achieving this objective can be expressed as the percentage of the Soviet population that can be killed in a retaliatory attack after a Soviet first strike on our strategic offensive forces. Against the high-NIPP Soviet threat, our current strategic offensive forces could kill 43% of the Soviet population from blast effects alone. This percentage of Soviets killed would result from the detonation of about 1,000 one-megaton equivalent weapons on Soviet cities. If retaliatory attacks were carried out only by individual components of our strategic forces, the following could result: ICBMs alone could kill 39% of the Soviet people; SLBMs alone could kill 29%; the bombers alone could kill 30%. The capability to kill 30% of the Soviet people corresponds to the destruction of the 150 largest Soviet cities and more than 50% of the Soviet industrial capacity. Thus, even if the Soviets could neutralize two of our offensive force components, the remaining component would provide a capability for urban destruction which would provide a strong deterrent against attack.

Where both sides possess a high retaliatory capability, the relative number of deaths that could result from a strategic nuclear exchange provides a measure of probability of war outbreak in crisis situations. Table III shows the percentage of the U.S. and Soviet people that might be killed in a nuclear war, assuming that the side that strikes first uses its bombers and a portion of its missiles to attack cities. It should be borne in mind that this assumption does not necessarily reflect either U.S. or Soviet probable targeting, either as preplanned or as would be adapted to the circumstances of an actual war.

TABLE III

DEATHS IN A NUCLEAR WAR
(End of FY 70)

Scenario	Deaths (Millions)	
	U.S.	Soviet
Soviets Strike First; U.S. Retaliates	100	120
U.S. Strikes First; Soviets Retaliate	110	100

In these scenarios, neither side would have an incentive to strike first in a deliberate attack, since it would suffer unacceptable fatalities in retaliation. Neither would either side have much incentive to preempt in a crisis, since it would suffer about the same number of fatalities whether it struck first or second. The strategic situation in the scenarios shown is therefore fairly stable. If either side were able, however, by the deployment of additional strategic offensive and/or defensive capabilities, to reduce drastically the fatalities it would suffer from a retaliatory strike, while the fatalities of the other side remained approximately constant, the situation would be destabilized. If, for example, the Soviet Union were able materially to reduce its fatalities from U.S. retaliation, the U.S. deterrent capability would have been degraded and the U.S. would be impelled to undertake additional programs to restore its capabilities. The situation would then also be unstable in a crisis since both sides might then have an incentive to preempt. There are of course other factors besides expected relative fatalities which would influence a decision to preempt.

2. Future Trends

The U.S. is planning to deploy a limited ABM to protect a part of its ICBM and bomber forces against a possible Soviet MIRV or increased numbers of large yield ICBMs, and to MIRV a substantial part of its strategic offensive missiles to cover the increasing number of Soviet threat targets and to insure penetration of a possible Soviet ballistic missile defense. The U.S. is also considering building a new advanced strategic bomber, a new advanced ICBM and a new advanced submarine-launched missile system.

The Soviet Union is continuing to build up its fixed land-based ICBM force and may be developing a mobile ICBM launcher as well as mobile IR/MRBM launchers. It is constructing additional ballistic missile launching submarines similar to the U.S. Polaris. It is testing an improved ABM of the Moscow type. Its recent tests of multiple warheads on an SS-9 booster may be precursors to the development of a MIRV capability. It may be planning to deploy a depressed trajectory ICBM (DICBM) or a fractional orbital bombardment system (FOBS).

3. Implications

Programs under way or planned by each side seem to be largely in response to or in anticipation of the other's actions. Some Soviet programs, of course, may represent a Soviet effort to achieve an advantage over the U.S. Nevertheless, the present relatively stable strategic situation, with each side having an adequate retaliatory capability (the U.S. with any one component of its strategic forces) and little incentive to preempt, would suggest that there is little requirement for U.S. response to Soviet strategic systems in being or under construction.

Furthermore, both the USSR and the United States have now reached a point, both in technology and industro-economic capability, where either can defeat attempts by the other to remove its deterrent capability and can thus deny the other the prospect of achieving a posture which might give it an incentive to strike first. Offensive damage limiting systems can be defeated by survivable retaliatory systems; defensive damage limiting systems can be defeated by varied and complex re-entry systems. Attempts on the part of either country to achieve a first strike capability would thus merely raise the ante of the game--an ante which both countries have an approximately equal capability to meet. To the extent that U.S. or Soviet planned programs are designed to achieve a significant advantage over the other, therefore, they would appear to be futile. To the extent that planned programs are purely anticipatory--designed against contingent threats--

they could be made unnecessary for either side if the opposing contingent threat were foreclosed. The security of neither side would be adversely affected, therefore, if strategic arms programs could be effectively limited on both sides.

If programs under way or planned on either side are carried much further, however, the additional uncertainties created for the other side will increase the perceived necessities to respond. For example, if the Soviet Union continues its present rate of deployment of SLBMs and fixed land-based ICBMs, initiates the deployment of land-mobile ICBMs, DICBM or FOBS, undertakes flight testing of MIRVs, and resumes the deployment of the Galosh around Moscow, the U.S. will be under considerable pressure to push ahead with prudential increases in strategic offensive and/or defensive programs. Similarly, U.S. MIRV and ABM deployment programs might persuade the Soviets of the necessity to expand their strategic deployment efforts beyond those already under way. Thus, if either side pushes ahead with significant improvements in its strategic capabilities, an arms race will probably ensue.

The U.S. and the Soviet Union have therefore reached a critical decision juncture: whether to agree to act bilaterally to try to curb the further growth of strategic nuclear capabilities, or to pursue security primarily through unilateral increases in strategic capabilities in competition with each other.

D. Relationship between Unilateral Approach to Security (NSSM-3) and the Arms Control Approach (NSSM-28)

The U.S. choice of a strategy and force posture will affect the prospects for strategic arms control and the nature and scope of a possible agreement. Conversely, a strategic arms control agreement which effectively limited the threat to the U.S. would affect the nature and size of U.S. forces required to maintain the national security.

NSSM-3 directed a detailed study of the security and foreign policy implications of a wide range of U.S. strategies and budget levels for strategic and general purpose forces. The analysis of the several force structures examined for each alternative strategy proceeded in three steps or "iterations," in order to take into account possible Soviet reactions to U.S. forces and strategies. In the first step, or "initial analysis," the retaliatory and damage-limiting capabilities of alternative U.S. strategic forces were measured against projected (non-reactive) Soviet threats, including a "Greater-Than-Expected" (GTE) threat designed to reduce severely the U.S. retaliatory capability. In the second step, or "interaction analysis," the retaliatory and damage-limiting capabilities of alternative U.S. forces were measured against Soviet reactive threats. These reactive threats were determined in separate analyses of possible Soviet responses to the alternative U.S. forces and strategies. Although the interaction between the force posture and the possibility of arms control was considered in each case in NSSM-3, as well as the impact of each posture on U.S.-Soviet relations, the prospect that each posture offered as a basis for an arms control agreement was not considered a governing criterion of acceptability.

The NSSM-3 analysis showed that current U.S. strategic forces are adequate for deterrence against present Soviet forces (43% Soviet fatalities from immediate blast effects alone). None of the options considered significantly improved that capability against the estimated Soviet reactive threat, and in some cases the U.S. capability was less than at present.

Given present capabilities and future trends, there appear to be two fundamental problems with the unilateral pursuit of strategic objectives.

1. Some objectives cannot be attained with any degree of confidence in view of probable Soviet reactions.

2. Pursuit of those objectives that are attainable is becoming increasingly risky and expensive and can lead to long-term instabilities in U.S-Soviet relations with no net increases in the security of either side or their allies.

Those objectives that would be pursued through extensive deployments of offensive and defensive forces are unlikely to be attained because the Soviets could respond with similar deployments to offset our desired capabilities. Thus, a confident U.S. damage limitation capability does not appear likely of attainment because of probable Soviet responses to our actions.

Even if the United States only emphasizes deterrence objectives, the strategic situation can still become unstable. On one hand, pursuit of high-confidence retaliatory capabilities may lead the Soviets to take similar precautions, which may arouse U.S. fears that the Soviets are building toward a first strike capability. On the other hand, pursuit of lower confidence U.S. retaliatory capabilities may lead the Soviets actually to pursue first strike capabilities.

While we are uncertain of the Soviets' strategic objectives, it is likely that they have an appreciation of the problem similar to ours. They undoubtedly estimate that we will respond to any attempts on their part to achieve first strike capabilities. They probably also realize that the United States may misinterpret Soviet efforts to improve their deterrent forces as efforts to improve their damage limiting capability so as to deny us a retaliatory capability.

Even if the United States continues to pursue only those strategic objectives which are attainable unilaterally, it may continue to have conflicts among its strategic objectives. The one between high confidence deterrence and long term stability has already been discussed. Related to this conflict is the prospect that in an era of unprecedented technological growth continued competition may give rise to new risks and uncertainties to threaten the strategic situation at any time. These uncertainties inherent in the unilateral approach suggest that we should consider whether there is not a more acceptable alternative approach to strategic force planning.

An alternative way to pursue some of our strategic objectives involves possible arms limitation agreements with the Soviet Union. While this approach has its own special and complex problems, as will be discussed later, it appears to contain some advantages over the unilateral approach. Even if an agreement does not alter the fundamental ideological and political differences between the United States and the Soviet Union or settle any of the existing international problems, it can benefit the United States in a variety of ways. It can also benefit the Soviet Union, but those benefits may not be detrimental to U.S. interests.

A bilateral or arms control approach to strategic force planning may help resolve some of the conflicts among our objectives and thereby enable the United States to attain objectives that would otherwise be impossible or risky to attain.

Strategic arms limitations can provide a framework within which we can maintain a stable strategic relationship with the Soviet Union. Agreements can constrain threats and reduce uncertainties, which would make it possible to slow down both the rate of increase and some of the qualitative improvements on both sides, since the chances of over-reactions and rapid growth of strategic forces would be minimized. A stable strategic relationship must not, however, be interpreted as meaning static equilibrium. Arms can be improved by presently unforeseen technology, and an agreement can survive only if based on a concept of dynamic stability under which each side can remain confident of maintaining its relative position no matter what the other does.

Given a stable strategic relationship with the Soviet Union, consideration can then be given to reduction of forces, leading to the possibility of reducing or at least preventing increases in expenditures without diminishing national security, assuming of course that possible developing Nth country threats do not require increased expenditures for other purposes.

The existence of these potential advantages does not mean that the bilateral (arms control) approach to strategic force planning is free from problems. In fact, new problems may arise in that agreements with the Soviets may conflict with our objectives against China and our relations with our allies. For example, our desires to limit Soviet ABM deployments may conflict with our requirement for missile defense against Chinese attacks. NATO may view U.S.-Soviet agreements as weakening the alliance. Our allies may then seek bilateral accords with the Soviet Union that conflict with alliance goals. Also, agreements to limit strategic forces may affect our ability to support certain NATO objectives.

Aside from the advantages and disadvantages of possible arms control agreements, there are possible benefits to be obtained from the negotiation process *per se*. The U.S.-Soviet dialogue that would occur either before a specific proposal is tabled or during the course of negotiations could itself have appreciable value, even if no agreement is reached, by leading to an improved understanding of the way the other side thinks about strategic problems.

On the other hand, protracted discussions without agreement could strengthen opposition to prudent programs, as well as lead to disenchantment of the non-nuclear powers with the sincerity of the U.S.-USSR commitment under Article VI of the NPT.

These considerations provided the background against which the NSSM-28 study has been conducted. NSSM-28 directed the development and evaluation of alternative options for a U.S. position for strategic arms limitations talks with Soviet Union. Among the critical implications considered in the study evaluation was the impact of each alternative limitation on U.S. strategic capabilities to maintain the national security. In the NSSM-28 analysis, however, the Soviet threat was seen in each case as constrained by an arms control agreement in the same way U.S. forces were limited. Thus, the objective in NSSM-28 has been to assess attainment of objectives through pursuit of a strategy that constrains strategic forces by arms control rather than attainment of objectives through increases in force capabilities (which could be offset by an opponent's adjustment of forces) as was investigated in NSSM-3.

In evaluating the acceptability and long term viability of U.S. strategic force postures which might be acceptable under an arms control agreement, we have also considered the possible nature and likelihood of Soviet evasion or abrogation of an agreement and the consequences of such actions for U.S. security.

E. Strategic Arms Control Objectives

We have proceeded in this study from the premise that the U.S. has the following strategic arms control objectives in seeking negotiations with the Soviet Union on strategic arms limitations:

1. To preserve and desirably to improve U.S. security and that of our allies.

2. To achieve and maintain a stable U.S.-Soviet strategic relationship--stable both in the sense of reducing the incentives to initiate strategic nuclear war and the sense of checking the strategic arms race.

3. To limit the damage which the U.S. and its allies might suffer in a strategic nuclear war.

4. To achieve objectives 1, 2 and 3 at minimum cost.

5. To improve U.S.-Soviet relationships by establishing a continuing process of discussion of issues arising from our strategic military relationships, and to provide a basis for moving toward a resolution of conflict situations involving the U.S. and the Soviet Union.

6. To support our policy of preventing nuclear weapon proliferation.

F. Principles

In selecting illustrative options for evaluation at this time we have been guided by the following principles:

1. Any proposed strategic arms limitations should apply to both offensive and defensive strategic systems.

2. To be negotiable, any proposal for limitations probably must:

a. Be considered by each side to be in its net security interest and compatible with national objectives.

b. As a minimum, permit each side to maintain what it considers an acceptable strategic deterrent capability. (Implies that offense must be able to overcome defense by some margin.)

3. Any agreement would have to be subject to acceptable verification.

4. Any agreement should have a good prospect for long-term viability.

5. Any agreement on reductions in strategic arms should be preceded by an agreement curtailing further buildups.

G. Verification Requirements

Several basic considerations will condition the nature and scope of possible arrangements for verification of Soviet compliance with a strategic arms limitation agreement:

1. The extent of our unilateral capabilities.

2. The very high probability that the Soviets will reject any form of on-site inspection on its territory, particularly in view of the fact that we have told them that we are prepared to "place maximum reliance on national means of verification."

3. The possibility that the use of data obtained by national means in order to document a charge of violation could adversely affect some of our intelligence capabilities. It is most probable, however, that the general nature of most of these intelligence capabilities is known to the Soviets.

4. The possibility of using the negotiations and the eventual agreement to help safeguard these intelligence capabilities.

Our overall unilateral capabilities are evaluated in NIE 11-13-69, and the application of these capabilities to each of the selected illustrative options is examined in Annex B of this paper.

We believe that we would almost certainly detect activities leading to a major change in Soviet strategic capabilities from those estimated or acknowledged at the time of the agreement.

Although it is highly unlikely that any large-scale new deployment of their strategic forces could go undetected, the Soviets could effect minor increases without our detection. And with extensive deception and concealment, they could degrade our intelligence capabilities. Detection and identification of the nature of the deployment would probably come later than in normal circumstances. However, in such a case the probability of the detection of at least one of a number of minor violations would be greater than that of detecting a violation of a single provision of the agreement.

Conclusion of an arms control agreement would probably signify that the Soviets had decided to accept, at least for a time, the limitations imposed by such an agreement. Therefore, if the Soviets should employ concealment and deception to violate the agreement, we believe that their aim would be to alter the strategic balance. Any smaller stakes would hardly justify the risk.

The foregoing presumes that the Soviets will not directly interfere with the effective operation of our unilateral collection sources. We believe that they will refrain from interfering, both because of the possibility of U.S. reaction against their own operations and out of concern for the general political problems which such interference might produce.

In summary, our capabilities are adequate to verify within acceptable limits restrictions on numbers of ICBMs and SLBMs; to assure detection of mobile ICBM deployment by the time some 100-300 have been deployed, the number depending on Soviet concealment efforts; to detect the development of MIRVs at least one year prior to IOC, assuming flight testing to full range, which is believed to be essential; to monitor fixed ABM launcher levels with high confidence if ABM-associated radars are limited.

There would be a 50% chance that SLBM MIRVs could be developed without detection. We could not detect the deployment of MIRVs, once they are developed. The replacement of silo-launched IR/MRBMs with ICBMs could not be detected with any confidence. This would affect only 39 aim points, with 135 launchers.

In view both of the intrinsic physical limitations of our national capabilities and the problems in relying on some of them to support charges of violations, some restrictions on weapons systems which might be desirable in an agreement might not be considered adequately verifiable without some on-site inspection or other means of additional assurance. Even in areas where our unilateral capabilities are considered adequate, our confidence in Soviet compliance with the provisions of an agreement would be increased by additional means of assurance--e.g., on-site inspections, unmanned sensors, and test announcements.[1]

We should bear in mind, however, that a sustained and unsuccessful U.S. effort to obtain Soviet acceptance of on-site inspection would lead to unnecessarily protracted negotiations under conditions when a quickly concluded agreement, other factors being equal, would be in the U.S. interest.

The United States must therefore be prepared, in advancing and accepting a strategic arms limitation agreement, to place exclusive reliance on national means of verification. This basic premise could mean,

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[1] There are cases in which our confidence in our ability to verify compliance with an agreement would not be materially improved by on-site inspection--e.g., with mobile land-based missile systems.

in the end, a less comprehensive agreement than would ideally be the case. At the same time, the necessity for placing sole reliance on national means of verification might result in our having less than full assurance of verifying compliance with certain restrictions (e.g., a ban on retrofitting silo-launched IR/MRBMs with ICBMs) which we would wish included. Such risks should be weighed against the overall advantages of an agreement, and deviation from the requirement for positive and assured means of verification, including on-site inspection where necessary, should be accepted only after examination of alternatives leads to the judgment that deviation in a specific case is in the best interests of the U.S.

U.S. willingness to rely exclusively on national means of verification does not mean that our negotiators would avoid discussion of possible on-site inspection arrangements. It is anticipated that, at an early stage of negotiations, they would probe Soviet receptivity to provisions for "selective direct observations" (SDO) of such a nature as would reinforce verification capabilities in certain sensitive areas and, thereby, enhance the viability of the agreement. If, however, the Soviets, as expected, opposed limited on-site inspection (SDO) as a supplementary means of verification, our negotiators would be authorized to proceed with negotiations on the basis of exclusive reliance on national means.

H. Safeguards

The capability for effective verification of Soviet compliance with the restrictions imposed by an agreement is the first safeguard that U.S. security will not be jeopardized by Soviet violation of the agreement.

There remains, however, the possibility that Soviet actions not prohibited by the agreement could upset the strategic balance established by the agreement, or that the Soviet Union might seek to gain a strategic advantage by clandestine activities permitting rapid further deployments after abrogation of the agreement. Another possibility is that the Soviets might achieve a technological breakthrough which would make existing strategic weapons obsolete and produce a significant change in the nature of strategic warfare.

Since it is unlikely that the Soviets would enter a strategic arms control agreement that they did not consider in their net security interest, it seems that they would have little rational motivation, at least over the short term, to violate or abrogate the agreement and incur the risks attendant upon such a course, including the probability of a further arms race. Nevertheless, the U.S. must have safeguards against the contingency that the Soviet Union might be able to gain an advantage by one of the means described above.

The possibility of a technological breakthrough, with all its implications, exists independent of an arms control agreement. That possibility must always be guarded against by a vigorous program of research and development to insure that we are not surprised, and that we always have the flexibility to respond to possible Soviet improvements resulting from technological advance.

The possibility that our relative strategic position might be threatened by Soviet arms programs not prohibited or restricted by an agreement is a function of the comprehensiveness of the agreement. The larger the number of options left open to the Soviets the greater the danger of a new threat and the greater our need for ready options for response. The fewer the options left open to the Soviets the less likely we will be confronted with improved capabilities that might threaten our relative position and the smaller the requirement for pursuing active new weapons programs as safeguards. We have an important safeguard now against any new threat in the existence of a strong retaliatory capability in each of the three components of our strategic offensive forces. The best further safeguard against possible increased Soviet threats developing within the limits of the agreement would seem to be to make the agreement the most comprehensive that can be verified and negotiated.

On the other hand, the possibility of restructuring our forces in response to an indicated changing Soviet threat would provide us an additional safeguard under agreements in which some options are left open. It can also be argued that the less comprehensive the agreement the easier it will be to verify and therefore the less vulnerable we will be to surprise and disadvantage and the smaller will be the requirement for hedges or safeguards. This argument rests on the assumption that the larger the number of restrictions the greater the mathematical chance that one can be successfully evaded.

It is less likely, however, with all significant activities restricted, that any one successful evasion would materially affect the balance, and the greater the number of evasions the Soviets have to attempt in order to achieve an advantage the greater the mathematical chance of detection. We would therefore seem to incur less risk, rather than more, by including in the agreement restrictions on all activities we think we can detect before they pose unacceptable risks. Even in the case of Soviet systems which we have limited capability to monitor, such as land-mobile ICBMs, we would probably gain by including them, if we have no plans for such systems ourselves, merely for the inhibiting effect their inclusion would have on Soviet actions.

In summary, an agreement which leaves various systems unrestricted would not appear to reduce the requirements for safeguards; it would merely leave open the opportunity for both sides to hedge under the agreement, so that the arms race could continue in new channels.

Even if possible authorized Soviet strategic arms options are severely limited by an agreement, there remains the possibility that the Soviets might be able to improve their position by successful clandestine violation of the agreement or by clandestine preparation for rapid deployment of new or additional weapons after abrogation. This is the basic risk against which safeguards must be provided.

The essence of a successful U.S. safeguards program, in addition to a vigorous research and development program, must therefore be the maintenance of a minimum lead-time capability to deploy new or additional weapons in response to possible Soviet violations or abrogation of the agreement. For example, if MIRVs were prohibited it might be desirable to prepare for rapid contingent future deployment of MIRVs by deploying the larger single-warhead Minuteman III or Poseidon missiles now to replace Minuteman II and Polaris missiles.

Safeguards programs must be planned and prosecuted with care, however, so that such actions as just referred to, or authorized development and test activities, do not provoke the Soviets to a "hedging race" or to abrogation on the grounds that we are cheating.

Annex D discusses the safeguards considered necessary or desirable for each option, together with the estimated costs thereof.

I. Negotiating Considerations

This paper does not examine the tactical negotiating issues which may be involved in strategic arms talks. However, there are certain negotiating considerations which are germane to a policy examination based upon this study.

First, the options analyzed in this paper should be viewed as illustrations of possible outcomes of strategic arms negotiations with the Soviets. The specific initial position we may adopt will be developed after decisions are made as a result of this study as to the final outcome we seek. However, it should be noted that uncertainties as to the possible Soviet position suggest that the actual outcome of the talks can be expected to be different from both our initial position and the specific outcomes illustrated in this study. Thus, these options should be examined from the standpoint of the various issues involved in the talks and with a view to establishing a range of acceptable outcomes.

Second, it will be necessary at an early point in negotiations to establish what in the long run we are willing to consider prohibiting or limiting so that we and the Soviets can arrive at an understanding to refrain from activities which would jeopardize agreement in these areas. Such understandings would be designed to place appropriate restraints on a) further deployment of existing systems, and b) steps toward deployment of new systems. These restraints would not, in all cases, necessarily involve total suspension of new programs and further deployments; they might simply require a reduced pace of activity.

In the first case above, we might seek to restrain further ICBM or SLBM deployment while we negotiate arrangements setting limits on such forces. Proposed limitations based on estimates of the strategic situation as of July 1, 1969, (the date of this study) may be difficult to negotiate if further deployments substantially change the strategic situation during the talks.

In the second case, if MIRV's and mobile ICBM's may ultimately be banned, each side may have to cease MIRV-related testing activities and not begin deploying mobile ICBM's while negotiations continue -- otherwise the problems of verifying such prohibitions by national means may be so great as to make agreement impossible.

In reaching such understandings it will be necessary to balance several factors. We do not want an understanding that is so far-reaching that it is as difficult to negotiate as a final agreement. Moreover, we want to be sure that the restrictions on our programs, and the funding, planning and development uncertainties they could entail, would not, when considered along with the restrictions imposed on Soviet programs, pose unacceptable military risks should final agreement not be forthcoming. At the same time, we want to foreclose to the extent possible continuing Soviet buildups, not only because of the threat to our security which they might pose, but also because they might jeopardize the possibility of reaching an acceptable agreement.

To meet these problems and to avoid the disincentives to prompt agreement which moratoriums of indefinite duration might involve, we might wish to consider understandings of limited duration.

However, such limitations could involve introducing undesirable "crunch points" in the negotiating process. Moreover, limited duration might not in the end provide the desired freedom of action, given the political pressures which would build up as the period of the understanding neared expiration. We will want to retain our flexibility on these issues until we have an opportunity to assess the Soviet reaction to the problem of restraints.

Finally, in considering the question of restraints, it should be noted that one of our principal programs--MIRV--may be a wasting negotiating asset. As the MIRV flight test program proceeds, an offer to suspend it may prove less and less valuable in eliciting Soviet agreement to limitations we may wish on their programs.

Related to the question of suspensions is the problem of establishing a "cut-off date" for implementing agreed prohibitions or limitations. For some systems such as fixed ICBM's this date might be the date that a suspension on further deployment went into effect. Systems or programs that are not curbed during negotiations or that are stretched out, or whose deployment (like ABM) lies in the future, will require that a cut-off date be negotiated along with the relevant limitation.

Third, interest has been expressed in developing a position which by virtue of its simplicity might serve as the basis for reaching prompt agreement with the Soviets. In considering the options in this paper, it should be kept in mind that the least restrictive measures may not turn out to be the simplest in terms of their impact on the strategic balance nor prove the easiest to negotiate. It may be that the more comprehensive options, because of their tendency to hold the strategic balance closer to its present position, might prove more readily negotiable than the options which permit a substantial degree of continued arms competition.

In this connection, it is possible that some political benefits of a prompt U.S./Soviet agreement could be derived from the understanding, indicated above, concerning the suspension of certain activities during negotiations.

Fourth, both our allies and the Soviets can be expected to raise the question of the role of Nth country (UK, France, China) nuclear forces. We will need to make clear that while a stable strategic arms agreement must take into account the threat posed by Nth country forces, we would not propose to discuss the possibility of seeking limits on such forces, particularly since this would require broadening the U.S./Soviet talks into a multilateral discussion in which Communist China would in any case refuse to participate. We should explain to the Soviets that although we will be consulting fully with our allies, this does not mean that we can negotiate on behalf of the UK and France. By the same token, we would not expect the USSR to negotiate for the CPR.

How talks might actually proceed cannot be determined in advance of the talks, that is, until we receive some Soviet reaction. The review of the optional outcomes in this study should provide well defined goals, as well as a flexible basis for negotiation, with respect both to the acceptable substantive elements of a possible strategic arms agreement and to the form and duration of the accords which may be reached.

J. Criteria for Evaluating Options

The following were used as criteria and factors against which to evaluate the acceptability of the selected illustrative options as the basis of a U.S. position for strategic arms limitations talks with the Soviet Union.

1. The strategic capabilities of the United States and the Soviet Union as measured by the following:

a. The capability of U.S. strategic forces to inflict urban/industrial damage (fatalities/industrial capacity/RV's delivered/EMT delivered) on the Soviet Union in retaliation against an all-out Soviet surprise attack on our strategic forces.

b. The capability of Soviet strategic forces to inflict urban/industrial damage on the U.S. in retaliation against a U.S. first strike.

c. U.S. and Soviet fatalities in a nuclear war started by a Soviet or U.S. first strike for a range of war-fighting scenarios involving mixes of counterforce and countervalue attacks.

d. The capability of U.S. or Soviet strategic forces to limit damage in a nuclear war initiated by the other side.

e. The capability of U.S. or Soviet strategic forces to limit damage in a nuclear war initiated by itself.

f. Comparative numbers of Soviet and U.S. bombers, land-based ICBM's, IR/MRBM's, and sea-based ballistic missiles and ABM's surviving a first strike.

g. The difference between first and second strike fatalities for both the U.S. and the Soviet Union.

h. Sensitivity of U.S. strategic capabilities to Soviet evasions.

2. U.S. ability to verify Soviet compliance with the proposed limitations.

3. Likelihood and nature of Soviet evasion, including the nature, time, and cost of U.S. responses required to restore U.S. force effectiveness.

4. Possible U.S. and Soviet military responses within the limits of an agreement based on the option.

5. Possible U.S. and Soviet political responses within the limits of an agreement based on the option.

6. Negotiability of a proposal based on the option.

7. Viability over time of an agreement based on the option.

8. Impact on the strategic arms race.

9. Probable reactions of U.S. allies and other countries.

10. Costs of U.S. and Soviet strategic programs over ten-year period, including U.S. allowances for safeguards against Soviet cheating and possible changes in the U.S. general purpose forces.

11. The relationship and the compatibility between the proposed option and other arms control agreements negotiated in the past, proposals currently under consideration, or proposals which may logically follow an agreement negotiated as a result of SALT.

Notes:

1. The base-case threat was the estimated maximum Soviet forces within the limits of an agreement based on the option, plus high-NIPP ChiCom forces.

2. Calculations of the impact on strategic force capabilities were made in each case using force structures anticipated for 1978.

3. The results in all options were compared against the results of a non-arms-control strategic option selected from NSSM-3.

IV. Arms Control Implications of Strategic Weapons Systems

Each strategic weapons system has characteristics which differentiates it from the others in its significance in the strategic balance and its implications for the possibility of controlling strategic arms. These differences, relating to invulnerability, contribution to stability, verifiability of limitations, flexibility in use, etc., make it necessary to examine each strategic weapon system separately. It is necessary to determine whether each should and can be controlled, and if so how and to what degree, and to identify unresolved issues. Some of the more important issues involve interaction between weapons systems, both those that might be controlled and those that would be exempt. This section sets forth the arms control implications of the issues related to these weapons systems.

By examining individual weapons systems here we do not suggest that negotiations with the Soviets should be conducted on the basis of attempting to reach separate agreements on individual systems. We recognize that asymmetries of existing U.S. and Soviet strategic systems and on-going programs make it likely that any agreement would involve inter-system quid pro quos.

In limiting the numbers of missile systems we have considered limiting only the numbers of launchers, not the numbers of missiles, since the strategic capability of a nation is more a function of launcher numbers than missile numbers and since numbers of launchers are more verifiable than numbers of missiles, which cannot be counted accurately. (A partial exception may be necessary in the case of ABMs, see para. H below.) We have not considered limits on the production of strategic weapons systems (except for land mobile systems, see para. D below), because verification of such a measure would require intrusive inspection, nor have we considered the implications of possible reductions in strategic weapons inventories.

For the purposes of this study, strategic weapons have been defined as including all offensive land-based missiles with range capabilities over 1000 kms (thus excluding the U.S. Pershing and the Soviet SS-12 tactical missile, but including Soviet IR/MRBMs); all submarine-launched missiles, whether ballistic or cruise, and regardless of their range; all long- and medium-range bombers; all ABMs; and bomber defenses. We have not included fighter-bombers although the Soviets may argue that these are strategic in that, in their eyes, U.S. fighter-bombers in Europe and those based on aircraft carriers could deliver nuclear attacks on the Soviet Union.

In determining which of these strategic weapons systems should be controlled and how they might be controlled, consideration should be given to the following factors:

1. Their effect on the strategic balance. (Will their omission or limitation give either side a marked advantage? In particular, is it to the advantage or disadvantage of the U.S.?)

2. Their effect on strategic stability. (Will their omission drive the arms race by requiring responses or over-responses?)

3. Their effect on crisis stability. (Will their omission or limitation make the initiation of strategic war in a crisis more or less likely?)

4. Their complexity. (are the related issues to complex for early resolution?)

5. Their negotiability. (Is the commitment to the system on one side or the other such that it may not be revocable?)

6. Their verifiability. (Could compliance with a restriction be adequately verified?)

7. The strategic position against Nth countries. (Could agreements make the U.S. or the U.S.S.R. vulnerable to Nth country attack?)

In identifying the arms control implication of the various types of strategic weapons systems there has been considerable agreement among the agencies involved in this study, but also important differences. The arms control implications of each type of weapons system and the major areas in which there are differences of opinion are summarized below:

A. Numbers of Fixed ICBM Launchers

The U.S. has 1054 operational ICBM launchers and does not at this time plan to increase this number. However, the U.S. does plan to convert 514 of its Minuteman I and IIs to MIRVed Minuteman IIIs. The latter can be accommodated in the current silos after certain internal silo modification.

The Soviet Union as of 1 July 1969 will have 1046-1056 operational ICBM launchers, with an additional 228-290 under construction. In the absence of an arms control agreement, the Soviets may well increase the number of their ICBM launchers. If we were to permit the Soviets to complete silos under construction on July 1, the total number of operational silos would not exceed about 1300-1350. This Soviet differential would be offset by the larger numbers of U.S. SLBMs and bombers. Each side should be permitted an additional agreed number of research and development and training launchers.

We have high confidence in our capability to verify, within close tolerances and with national means alone, a limit on the number of fixed ICBM launchers.

Issue

None, since it is generally agreed that any SALT agreement should limit the number of ICBM launchers at somewhat comparable levels.

B. ICBM Survivability

As offensive missile accuracies and throw weights improve, and particularly if MIRVed systems introduce large numbers of accurate RVs, the vulnerability of ICBMs to counterforce attacks by offensive missiles will increase. There are several ways in which this problem might be handled. One way would be to freeze the current mix of large and small missiles. Another way would be to constrain the development of MIRVs and other counterforce related characteristics. (This approach is discussed in paragraphs G & J below.) Survivability could also be improved by the shifting of strategic forces from fixed land-based systems to mobile land or sea-based systems. (This approach is discussed in paragraph E below.) A fourth way would be to increase the hardness of ICBM silos and command and control installations by building them in new hard-rock locations ("super-harden") and/or to protect ICBMs with ABMs ("hard-point defense").

Whether super-hardening of ICBM sites should be permitted is controversial. Such a move would not erode the other side's deterrent, and thus would not be destabilizing. However because super-hardening would require relocation of ICBM sites, it would introduce verification problems and negotiating complexities. It would be difficult to verify with national means whether abandoned silos had really been made unusable unless they were destroyed and cratered. If it were desired to limit the size of new launchers, it would be very difficult to verify that the new silo was not deep enough to accommodate larger missiles. There would also be a problem in arranging the transition from old silos to new. It would be necessary to assure through appropriate agreed procedures that a missile force was neither significantly larger by virtue of having old and new silos operational at the same time nor significantly smaller by having periods in which neither the old or the new silos were operational. Of course even super-hardened silos could become vulnerable to missiles of sufficiently improved accuracy and throw-weight if no agreed constraints were placed on such improvements. It should be noted that the Soviets stand to gain substantially from relocation and hardening provisions since they presently have many relatively soft, co-located ICBMs. Relocating these to hard, dispersed sites would greatly increase U.S. targeting problems.

The vulnerability of ICBM sites could also be reduced by deploying hard-point ABM defenses. Like super-hardening, hard-point ABM defense, per se, would not be destabilizing since it would not erode the other side's deterrent and would be readily verifiable. However, in some cases, hard-point defense could, or could be perceived to, provide coincidental defense of urban population and industry and hence could be viewed as a threat to the other side's deterrent. (See paragraph H for a fuller discussion of ABMs.)

Issues

a. Should launcher replacement (super-hardening) of ICBMs be permitted up to an agreed number of launchers?

b. Should hard-point ABM defense of ICBMs be permitted up to an agreed number of launchers/missiles?

C. Numbers of SLBM and SLCM Launchers

The U.S. has no current plans to increase the number (656) of its submarine launched ballistic missile (SLBM) launchers but plans to convert 31 of 41 Polaris submarines to handle the MIRVed Poseidon missile by FY 77. The U.S. has no submarine launched cruise missiles (SLCMs).

The Soviets have embarked on a major Polaris-type submarine building program. By 1 July 1969 it is estimated that the Soviet Union will have operational 108 shorter range (i.e., 350 nm and 750 nm) SLBMs in about 37 older (nuclear and diesel) submarines and 96-112 Polaris type (1500 nm) SLBMs in 6-7 new type submarines for a total of 204-220 SLBMs. In addition they will have 13-16 of the Polaris-type submarines under construction making available a total (when completed) of 412-476 SLBMs. It is estimated that in the absence of an arms control agreement the Soviets will continue to increase their SLBM capability so that by 1978 their total would be 656-896 launchers. However the operational availability (on-station time) of each U.S. SLBM submarine will be considerably greater than Soviet SLBM submarines due to the use of U.S. advanced bases at Holy Loch, Rota, and Guam. This situation could change in the future either by U.S. withdrawal from these bases or by Soviet acquisition of forward bases (e.g., in Cuba).

The Soviets also have a fleet of 60-62 nuclear and diesel submarines equipped with from four to eight SS-N-3, 250 nm cruise missile launchers each for a total of 348-364 SLCM launchers. We estimate that they do not plan to increase the number of their SLCMs, but that if they wanted to increase their capabilities they could probably develop a new longer range cruise missile. The Soviets will probably claim that SLCMs are not strategic weapons but are intended only as anti-shipping weapons. They may claim that U.S. carrier forces pose a threat to the Soviet Union equal to or greater than that posed to the U.S. by their SLCMs. SLCMs do not have the range or the accuracy to threaten Minuteman sites but could be used to attack targets near the U.S. coasts.

Since SLBMs are at present practically invulnerable to a counter-force first strike, they can be considered the most stable offensive missile system in the sense of being able to wait out an attack and thus reducing the incentive to strike first. The accuracy of current generation U.S. and Soviet SLBMs limits their usefulness in attacking hardened targets. They can, however, pose a threat to soft targets, particularly bomber bases since they can reduce warning time. The U.S. Poseidon MIRVed missile will have sufficient accuracy to make it an excellent counterforce weapon against hardened targets. Soviet SLBMs are now vulnerable to some loss to U.S. ASW and the current generation U.S. SLBM may become vulnerable to possible future Soviet advanced anti-submarine warfare.

Some believe that because SLBMs contribute to stable deterrence they should be excluded from a strategic arms control agreement. Others believe that an agreement intended to halt the strategic arms race should include all offensive strategic missiles. In view of the large Soviet SLBM submarine construction program, omitting SLBMs from an agreement would leave unconstrained a potentially serious threat to the U.S. which would require significant U.S. counter-measures.

There are also two views on SLCMs. Some feel that because of the possible linkage which the Soviets may make between SLCMs and U.S. carrier forces, it would be counter-productive to suggest their inclusion in a strategic arms control agreement. Others believe that the potential threat of SLCMs to the U.S. requires that their number be limited.

We have high confidence in our national capability to monitor a limit on the number of submarines and launchers of both the ballistic and cruise type. We would have a good chance of detecting the construction of surface ships equipped to launch strategic missiles, or the testing of the system at sea.

Issues

a. Should a limit on the number of SLBM launchers be included in an agreement?

b. If so, what limit if any should be set on the total Soviet SLBM launchers that they might claim to have operational and under construction?

c. Should SLCM launchers be included in an agreement?

D. Land-Mobile ICBMs, IR/MRBMs and ABMs

The U.S. does not have any current plans to develop land-mobile strategic weapons systems. The Soviets are developing a land-mobile IR/MRBM and have indicated considerable interest in developing a land-mobile ICBM. They have not shown any indication of interest in a land-mobile ABM.

The effect of land-mobile offensive systems on strategic stability may be considered ambiguous. They cannot be reliably targetted and could be expected to survive a first strike, and therefore may be considered stabilizing. On the other hand, mobile ICBMs could be used as a first strike weapon against the U.S. if high accuracies can be achieved.

Since ABM launchers themselves are not normally considered worthwhile missile targets, the primary advantage of mobile ABMs would be to introduce uncertainty as to the distribution of the ABM defense and thus complicate offensive targeting. However this tactic might be worthwhile only if heavy "urban" or "hard-point" defense ABM systems were to be deployed. It would provide little advantage to small hard-point or anti-Nth country defenses.

The most important problem which permitting land-mobile systems would pose is verification since it would be difficult to verify a numerical limit on such systems. We believe we would be able to identify a land-mobile system, but perhaps only when it had become operational in substantial numbers. In addition, it would be extremely difficult, if not impossible, to make any precise determination of the number of mobile weapons in a deployed force, although we think that we would be able to estimate the general magnitude of the deployment. Thus, from a verification point of view, it is highly desirable to ban mobile ICBMs, IR/MRBMs and ABMs altogether since, in this case, the identification of a single mobile launcher would be evidence of a violation of the agreement. However, since the Soviets would be permitted to have mobile tactical missiles (e.g., the SS-12 or Scaleboard), there might be difficulties in eventually distinguishing between these and mobile MRBMs.

A ban on mobile ICBMs, IR/MRBMs and ABMs should include banning their production, since it otherwise would be possible to produce such weapons, store them in covered areas and then, upon abrogation, rapidly deploy them. Since confidence and crew training firing would be required for any significant mobile deployment programs, the testing of missiles from mobile launchers should also be banned.

There is agreement that land-mobile IR/MRBMs should be banned. There are differences of opinion regarding land-mobile ICBMs and ABMs. Even though the U.S. has no present plans to develop either type of system, some believe that the non-targetibility of land-mobile ICBMs and the tactical flexibility of land-mobile ABMs makes it desirable to retain an option to deploy such systems. Others believe that the verification problems cited above require that all mobile land-based strategic missile systems be prohibited.

Issues

a. Should land-mobile ICBMs be prohibited or should they be permitted within total ICBM limits?

b. Should land-mobile ABMs be prohibited or should they be permitted within total ABM limits?

E. Flexibility to Alter the Mix of Fixed and Mobile Systems

The discussion of limits on numbers of offensive missile launchers discussed above assumed that there would be agreed totals for each type system (i.e., fixed land-based ICBMs, mobile ICBMs (if allowed), SLBMs, SLCMs and fixed ABMs). However, it might be desirable, under certain circumstances, to permit altering the mix of analogous weapon systems by substituting from one component to another within a fixed total number. Three "freedom-to-mix" cases have been examined.

It might be desirable to permit altering the mix of offensive missile systems by substituting sea-based offensive missiles (either submarine or surface ship launched) for fixed land-based offensive missiles, or vice versa. The more difficult to verify mobile land based launchers would be prohibited. The purpose of this freedom-to-mix would be primarily to permit each nation to retain the option to enhance the survivability of its retaliatory forces if they are threatened and to reduce the incentive for the other party to strike first. Under most conditions, a well-designed mix of strategic systems is more effective than any single system, since each element of the mix requires a counter system of the opponent and each element tends to hedge against possible weaknesses or vulnerabilities in the others. Furthermore exploitation by the U.S.S.R. of freedom-to-move-to-sea would diminish pressure on the U.S. to do the same since Soviet SLBMs do not have currently the accuracy to successfully attack U.S. missile silos.

A second proposal would permit mobile ICBMs and freedom, within an agreed total, to alter the mix of fixed and mobile ICBM systems. The rationale for this proposal is the same as for altering the mix of fixed land-based and mobile sea based systems discussed above (i.e., increased survivability). However mobile land-based ICBMs would be more difficult to verify than mobile sea-based systems. In addition the Soviets have ongoing land-mobile missile programs that are unmatched by the U.S.

Flexibility to alter the mix of fixed land and mobile sea-based ABM systems has also been proposed. The proponents argue that in the event of an agreement limiting the number of ABM interceptors/launchers, both sides would be motivated to optimize their ABM effectiveness through the best mixes and deployments of a limited number of ABM. Considerable ABM advantage can be gained by deploying a mid-course intercept system as a complement to a terminal system. The U.S.S.R. land area is such that the Soviets could achieve an optimum ABM defense-in-depth against U.S. missiles by utilizing northern land areas and Arctic Islands for mid-course intercept installations, while for the United States it might be more feasible to use sea areas of the North Pacific and Atlantic to achieve a comparable deployment. Sea-based ABMs also provide the option to defend friendly countries neighboring the CPR or Soviet Union from nuclear attack or black-mail.

From the Soviet viewpoint, a better case can be made for permitting the freedom to substitute sea-based missiles for land-based missiles. The Soviet SLBM fleet, even with the submarines currently under construction, would be considerably smaller than that of the United States. In addition, the U.S. forward submarine bases provide the United States a far better on-station capability than that which the Soviets could probably achieve. At the same time the Soviets have a number of soft ICBMs and IR/MRBMs. Thus if the United States were to permit the

Soviets to substitute SLBMs for soft ICBMs or IR/MRBMs, the survivability of Soviet missile forces might be enhanced and an agreement made more negotiable. On the other hand, such a provision could increase the Soviet capabilities to strike those U.S. targets which are vulnerable to Soviet SLBMs. To the degree that the Soviets might reduce their IR/MRBMs under this option, the agreement might be more satisfying to our NATO allies. This option might be proposed to the Soviets, either in the form of reaching agreement at the time of negotiations as to the substitutions they were going to make and when, or permitting them to alter the mix at will, provided sufficient notice of the timing and extent of the alterations were provided the United States.

However those who oppose incorporating freedom-to-mix in an agreement point out that negotiation and implementing such an arms control agreement would present serious verification and procedure problems. The primary difficulty would be attempting to keep track of the total mix of the other side's strategic forces by national verification means (or for that matter even by inspection). When a new silo complex or a new submarine was identified, a nation might not be sure if this increment was an illegal augmentation or a legal substitution. If told that it was a substitution, then a nation would have to determine if the other components of the force had, in fact, been reduced by an equal amount. These problems might be alleviated to some degree by establishing certain notification procedures which would precede an alteration of the mix. It might also be possible to provide on-site inspection to assure that the abandoned site or submarine launcher had been rendered inoperable. However, to the extent that one side's forces shifted from fixed to mobile, particularly to land mobile systems, the verifiability of the total size of the force would be reduced.

In addition, such a flexible agreement, with new weapon systems of one type being substituted for old systems of another type, might be more unstable than an agreement fixing the mix. There would be qualitative, as well as quantitative uncertainties which might create suspicions of violations and fear of abrogation. With such a loophole in the agreement, there would be heavy pressure to exercise the option to mix as a hedge against the other side's possible use of the option, even though the gain in confidence in one's deterrent might be marginal and unnecessary. The strategic arms control objective of achieving stability and balance at minimum cost would be less achievable as each side would be almost as free (constrained solely by some total number of offensive and/or defensive launchers) as it is today to continue strategic arms procurement, and would undoubtedly find its strategic budgets increasing. On the other hand, those who favor freedom-to-mix believe that measures to exploit vulnerability of a frozen element of the force would be highly destabilizing. The awareness to both sides that the freedom-to-mix is available to restore survivability should discourage spending for increased counterforce capabilities and hence reduce the need to exercise the freedom-to-mix option.

Those who oppose freedom-to-mix point out that if offensive missile systems can be effectively constrained, both quantitatively and qualitatively, then the current U.S. ICBM force could not be damaged sufficiently to prevent adequate retaliation, and thus there would be no need to vary the mix. If offensive missile characteristics cannot be sufficiently constrained to assure the survivability of our ICBMs, they believe it would be preferable to increase ICBM survivability through superhardening, rather than by trading ICBMs for the more expensive SLBMs. They also note that U.S. ICBM sites are closer to readily accessable open-ocean areas than those of the U.S.S.R. This could well provide the Soviets a significant advantage if sea-based ABMs were permitted. While it might be possible to limit fixed ABMs to a hard-point defense role, sea-based ABMs would have "urban" defense as well as force defense capabilities and thus would erode the assured deterrent of the opposing side.

Issues

a. Should an agreement permit altering the mix of land- and sea-based offensive missiles within some agreed total (with and without mobile land-based systems prohibited)?

b. Should an agreement permit altering the mix of fixed and mobile land-based ICBMs within some agreed total?

c. Should an agreement permit altering the mix of land- and sea-based ABM within some agreed total?

F. Fixed IR/MRBMs

The U.S. has no IR/MRBMs. The Soviets have 673 IR/MRBM launchers, about 90% of which are targeted on Western Europe with the remainder primarily in the Far East. Only 135 of the launchers are hard. There is no evidence that the Soviets plan to deploy more IR/MRBMs but they are developing new improved missiles.

The Soviets might claim that these weapons do not threaten the U.S. and are thus not strategic. However, they can be thought of as contributing to the Soviet strategic posture, since they do hold our NATO allies at risk and threaten our forces in Western Europe. For these reasons they should not be left unconstrained. Our NATO allies will expect the United States to seek limitations or reductions in Soviet IR/MRBMs to parallel similar actions sought in regard to ICBMs.

Since the U.S. capability to counter IR/MRBMs is enhanced by the fact that most IR/MRBMs are soft, it is desirable both to limit the number of IR/MRBM launchers and to ban further launcher hardening. It is also desirable to limit further qualitative improvements in these systems, particularly upgrading them to ICBM capabilities.

The Soviets may wish to relocate some of their European targeted weapons to increase their anti-China capabilities. In this case the U.S. should not oppose the relocation (provided only soft launchers were relocated to new soft sites and did not create additional aiming points) since the net effect would be to reduce the threat to Western Europe. However agreed procedures should be worked out to assure that the old IR/MRBM sites are rendered inoperable by the time the new sites become operational.

The Soviets may use acceptances of limits on IR/MRBMs as a bargaining tool, and might attempt to link them with reductions of U.S. tactical aircraft or missiles in Western Europe. The U.S. might link increases in Soviet SLBMs to decreases in IR/MRBMs.

With national intelligence means alone the U.S. can verify with high confidence within close tolerances the number of fixed IR/MRBM launchers. The deployment of present ICBM systems at soft IR/MRBM sites probably would be detected. We might not be able to detect the deployment of ICBMs in IR/MRBM silos.

Issues

None, since it is generally agreed that any SALT agreement should at least limit the number of IR/MRBM launchers to present levels and to the present soft/hard mix and posture.

G. MIRVs

The United States is developing MIRVs for two new U.S. missiles, Minuteman III and Poseidon. Distinctive signature flight testing of these systems was initiated on August 16, 1968. As of 1 June 1969, 14 out of a total of 52 scheduled flight tests will have been completed. The first Minuteman III missiles are programmed to be operational in June 1970 and phased into the force until a total of 514 replaces a like number of Minuteman I's and II's by end of FY 74. The first Poseidon missiles (in converted Polaris submarines) are scheduled to be operational in January 1971. Thirty-one of the total of forty-one Polaris submarines are programmed to be converted to Poseidon by FY 77.

The U.S. undertook its MIRV programs in response to anticipated large scale deployment of Soviet ABMs--i.e., in order to assure a capability to penetrate these defenses in a retaliatory strike. In the process of developing its MIRVs the U.S. has also developed new guidance systems the design specifications of which would make these weapons far more accurate than current generation missiles. While the U.S. did not develop these accuracies for the primary purpose of creating a first strike counterforce capability, the accuracies which the U.S. expects to achieve will make these systems significantly better counterforce weapons than current U.S. systems. They have been officially described in a public release as being "far better suited for destruction of hardened silos than existing warheads."

Since August 1968 the Soviets have conducted seven successful test flights in which three multiple warhead reentry vehicles (MRVs), roughly comparable to the Polaris A-3, were deployed from a single SS-9 booster. The three most recent tests reached ranges of some 5100 nm. None of these tests have demonstrated an independent targeting capability, however, and it is unclear whether the present program is designed to lead to development of such a capability. If this series of tests was limited to development of a MRV payload for the SS-9, such a system could be operational in late 1969. It is unlikely that the Soviets could achieve IOC with a MIRV of sufficient accuracy and reliability to warrant assignment against hard targets before 1972.

If the Soviets do proceed with a MIRV program the throw-weight of the SS-9 missile (and the projected SS-Z-3) would permit the Soviets to deploy much larger yield MIRV warheads than those planned for U.S. systems. If the Soviets were then able to achieve the accuracies which we project for our MIRV systems, a MIRVed SS-9 or SS-Z-3 would have a significantly greater hard-target destruction capability than either a Minuteman III or a Poseidon. The present and projected deployment of SS-9 and SS-Z-3 boosters, if equipped with accurate MIRVs, would provide the Soviets a greatly increased capability to destroy U.S. ICBMs and bomber bases unless the U.S. responds with strategic programs beyond those now approved.

There is considerable differences of opinion as to the desirability and feasibility of banning MIRVs. Some believe that MIRVs will have certain inherent qualities which would make them desirable in an arms control environment, that permitting MIRVs would facilitate reaching a strategic arms control agreement, and, in any case that a ban of MIRVs would be unverifiable. Others believe that MIRVs have inherently destabilizing features that make them very undesirable, that the Soviets will not accept an agreement that fails to ban MIRVs, and that, if MIRV flight testing is stopped soon enough, it will be possible to verify a ban on MIRVs. Due to the importance of this subject these two views have been explored in some detail.

Those who oppose a MIRV ban believe that MIRVs may be regarded as stabilizing to the extent that they provide for a margin of superiority of the offense over the defense. MIRVs provide increased target coverage as well as cross targeting capability and, if deemed necessary, can provide a hedge against technological break throughs, abrogation, or cheating. The counterforce threat which MIRVs pose can be mitigated by such means as "super-hardening," increased force mobility or "hard-point" ABM defenses. If the requirement for a large number of independently targetable warheads is foreseen, MIRVs would be more cost effective in achieving such a capability than single-warhead missiles.

The opponents of MIRV ban believe that once MIRV deployments have started, agreements to limit strategic arms would become substantially easier to negotiate in that the number, size, and accuracy of warheads in each vehicle would be accepted as so difficult to verify that it will not be considered. Each side would assume that the other has, or could, MIRV to the maximum possible extent, and will be aware of its right to do likewise. There will then be less incentive to attempt to match the opponent's offensive capability with ABM knowing its futility. It would be easier for each side to accept ABM deployments the other may find necessary to cope with Nth countries without fear that they threaten its assured destruction. In the absence of MIRVs, ABMs above certain levels could be destabilizing since they could reduce a nation's retaliatory capability below levels considered necessary for deterrence. In this case the motivation to preempt in a crisis could be increased. A MIRV, dispite its greater payload, will multiply the number of ABMs necessary for intercept without increasing equivalent megatonage (EMT).

On the other hand, if U.S.-Soviet agreement were reached to prohibit ABMs or limit them to low levels, MIRVs would not be required to provide the U.S. an assured deterrent and the stability that exists today could be preserved. ABMs create the requirement for MIRVs (for penetration) and MIRVs create the requirement for ABMs (for force protection). If both can be prohibited (or ABMs kept to low levels), neither may be required. While banning MIRVs would not eliminate completely the counter-force threat which offensive missiles pose, it would significantly reduce this threat.

In the absence of an early agreement limiting ABM's, however, each side may perceive a future threat to its assured destruction capability. Reacting to the Soviet buildup in fixed ICBM and SLBM forces and to the future possibility of an extensive, effective Soviet ABM deployment, the United States has already decided to deploy MIRVs. The Soviet Union is likely to make an analogous decision if, indeed, it has not already done so, and, in the absence of a MIRV ban, will probably also continue to develop and then deploy mobile ICBMs.

Once MIRV deployments have started, agreements to limit strategic arms will become substantially more difficult to negotiate. The number and size of MIRVed warheads deployed will be very difficult to verify. Each side will assume that the other has MIRVed or could MIRV, to the maximum possible extent, and will probably seek the right to do likewise. Even if an arms limitation agreement could be attained on this basis, it would result in strategic force ceilings higher than could be set in 1969.

Furthermore, because each MIRVed missile potentially could destroy a number of adversary missiles in a first strike, the disincentives to strike first in a crisis situation would be substantially eroded. Thus a strategic arms limitation agreement which limited the number of launchers probably would not eliminate the destabilizing effect of MIRVed forces, with its likely consequent increase in the risk of nuclear war. In addition to increasing the risk of war, MIRVed forces on both sides could result in greater damage to both sides if deterrence should fail.

The combination of both accurate MIRVs and high levels of urban ABMs could be particularly destabilizing. If a country could destroy its adversary's land-based strategic forces with MIRVs and intercept most of the remaining mobile missile forces with ABMs, it might be tempted to preempt in a crisis situation, particularly if it feared that its adversary would have an analogous temptation to strike first. To counter this first strike threat it might be considered necessary to place strategic missile forces in a "launch-on-warning" status wherein decisions to launch might have to be delegated or, in any case, made in a matter of minutes based on limited amounts of information. The danger of a nuclear war in such a "hair-trigger" situation is obvious.

Even in the absence of a crisis situation, a combination of the proposed U.S. MIRV program and a medium-size U.S. ABM deployment may well result in a Soviet conclusion that they no longer have an adequate deterrent. If the Soviets should therefore propose that ABMs be prohibited or limited to low levels, they would probably view continued U.S. insistance on deploying MIRVs as indicating a U.S. intent to develop a first strike counterforce capability, since there would be no requirement for MIRVs as a penetration device and the high accuracies which the U.S. expects to achieve with its MIRVs are not necessary for retaliatory attacks against urban areas. The Soviets could be expected to respond to this U.S. position by refusing to enter into any strategic arms limitation agreement until they had built up their strategic forces substantially higher than their present level.

To verify a MIRV ban we would have to rely primarily on banning MIRV and related (i.e., multiple RVs, all maneuvering RVs and buses----for the implications of banning maneuvering RVs see paragraph J) flight tests and our capability to detect violations of this ban by national verification means. There is little prospect that we could detect the deployment of MIRVs with national means alone once flight testing has been completed. Should the Soviets seek to develop a MIRV system for their ICBMs with either the high accuracy needed to attack targets with high assurance or with the ability to attack widely separated targets, they would have to undertake a comprehensive test program, and we have high confidence that we could detect and identify such tests at least a year prior to IOC. These detection lead time considerations apply both to an entirely new MIRV system and to an effort by the Soviets to upgrade their present MRV, which may be technically possible. Development of the latter into a MIRV system lacking either very high accuracy or a wide dispersal pattern would also be identified, but the interval between identification and IOC would probably be shorter. These estimates are based on current capabilities and the assumption that the Soviets would require the same type of flight test program that we currently plan for our MIRV development program. Contrary to the National Intelligence Estimate and past Soviet practices, a more conservative view holds that MIRV development, without tests or without tests which we could detect and identify, is technically feasible although more expensive, of greater risk and attended with lower confidence.

The dependence of a MIRV ban verification on a ban on MIRV flight testing makes this a most time-urgent problem. This problem is discussed separately in paragraph M.

Issue

Should the U.S. seek a ban on MIRVs and MIRV and related flight testing?

H. ABM Launchers

The importance of controlling ABMs is related to the nature of their capabilities. ABM systems whose capability is limited solely to defense of strategic offensive forces are not considered destabilizing in the sense that they protect retaliatory forces but do not threaten the other side's deterrent. However most force protection ABM systems will have, or can be perceived to have, capabilities to protect population and industry as well. This is the case to some extent with the U.S. Safeguard system. The location of approximately one-third of the Soviet ICBM sites near populated areas means that any Soviet force defense system might also provide some protection for Soviet population and industry.

ABM systems can also be designed primarily to limit damage to population and industry ("urban defense"). If it is deemed necessary to protect against irrational attacks from Nth countries (e.g., Communist China) and/or to protect against accidentally-launched offensive missiles, then ABM systems with a moderate defensive damage limiting capability may be desired. The question here is whether the possibilities of Nth country attack (either irrational or in retaliation for a U.S. disarming attack) and/or successful interception of an accidental launch are great enough to warrant both the expense of such systems, and the probable negative effect that such systems might have on strategic stability.

ABM systems which protect population and industry (defensive damage limiting systems) can be destabilizing, since they reduce the other side's deterrent capabilities and thus could cause it to deploy higher offensive force levels to compensate. Once more than a few hundred "urban" ABM interceptors are deployed, the other side will probably believe that it must have MIRVs or other increased offensive means to assure penetration in a retaliatory strike. The over-compensation which is likely to result from conservative planning could mean that, in a strategic war, the offensive forces would inflict more damage than would have been the case in the absence of a "damage limiting" ABM and the offensive response it had generated. Since an urban ABM system would be more effective against a retaliating force which had been disrupted by an initial counterforce attack, ABMs would lend some advantage to striking first. Once a basic nationwide ABM system has been installed, it would be easier to expend it rapidly after abrogation of a strategic arms control agreement, or to upgrade SAM systems clandestinely to give them ABM capabilities.

The differences in the arms control implications of the force defense ("hard-point") and the damage limitation ("urban") ABM missions suggests that in arms control negotiations it might be worthwhile to discuss "hard-point" and "urban" ABMs separately and to place different restraints on each type. If ABM systems were limited to terminal interceptors (which the Soviets do not at this time appear to be developing) or area interceptors whose location and fly-out range did not provide defense for a significant portion of the urban population, then separate consideration might be possible. But it is more likely that ABM systems designed primarily for force defense, like the Safeguard system, would have sufficient coincident "urban" defense capabilities to make this separation infeasible. If an ABM system was intended to provide, in addition to force defense, anti-Nth country and/or anti-accidental launch capabilities, it would have to have some urban defense capabilities.

Limits on ABM systems, like limits on offensive missile systems, should be by ABM launcher rather than ABM interceptor missile since it would be most difficult to verify limits on the number of interceptors. However, it is estimated that the Soviet Galosh ABM launcher may have an effective reload capability, permitting each launcher to launch more than one ABM interceptor. Since the intent of an ABM limit would be to provide each side approximately the same capability in terms of numbers of effective ABM interceptors, any agreement should account for reload capabilities.

To overcome this problem it has been suggested that the agreement should provide for an "equivalent" number of ABM launchers, with a reloadable launcher counting as the equivalent of two or more launchers. No precise way in which a verifiable determination of the reload capability of an ABM could be determined has yet been developed. However, if the U.S. raises the problem of "equivalent" ABM launchers, the Soviets may well counter with the U.S. advantages which stem from our advanced SLBM bases, superior air-tanker capability and the added survivability associated with hard, non-reloadable launchers. Although the U.S. could always respond with asymmetries which favor the U.S.S.R. (e.g., IR/MRBM, medium bombers, SLCMs), we may wish to forego this "equivalent" ABM launcher issue and, if necessary, provide reload capabilities for our ABMs.

The simplest way in which the various negative arms control implications of ABMs could be overcome would be to prohibit ABMs altogether. Since the Soviets might well object to having to dismantle their existing Moscow system of 64 Galosh interceptors, the U.S. might wish to consider permitting them to retain this relatively ineffective system as a partial quid pro quo for continued U.S. superiority in SLBMs.

If ABMs are not prohibited (or limited to the current Moscow system) but MIRVs are prohibited, then stringent limits on the number of "urban" ABMs must be set. Strategic exchange analyses indicate that, with MIRVs banned, effective urban ABM levels above about 500 substantially erode both side's missile retaliatory capability. (See Section V - C-5a)

If MIRVs are permitted, ABMs would probably be required for force defense and the governing criterion for the size of the ABM force might be the number needed to insure survival of one-third of the U.S. Minuteman force. The size and nature of the U.S. ABM force necessary for this task will depend on the Soviet offensive capability, the dispersion and hardness of U.S. Minuteman sites and the effectiveness of U.S. ABM systems.

Issues

a. Should the U.S. seek to prohibit or limit ABMs?

b. If we seek to prohibit ABMs, could we, as a bargaining tool, accept the retention of the current Soviet Moscow defense system?

c. If we seek to limit ABMs, should we seek separate limits on "hard-point defense" and "urban defense" ABMs?

d. Should the U.S. propose a specific limit on ABMs or await a Soviet proposed limit?

e. If the U.S. should propose a specific ABM limit, what should this limit be?

f. Should the U.S. insist on an "equivalent" number of ABM launchers based on reload capabilities?

I. ABM Associated Radars

Whether limits on ABMs should include limits on ABM-associated radars as well as ABM launchers is controversial. There is agreement that ABM radars are the most expensive ABM component and require the longest lead time. If they were limited, it would increase confidence in our verification of limits on ABM systems. If the construction of redundant ABM-capable radars were not limited, they could contribute significantly to a nation's capability to execute rapidly a planned abrogation of the ABM limits or to provide clandestinely some ABM capability for its SAMs or IR/MR/ICBMs. For example, if ABM-capable radars were not limited and additional radars were built, intelligence warning time for a significant violation could be reduced from 5-8 years to 1-2 years.

However, there are objections to inclusion of radar restriction in a strategic arms control agreement due to the difficulties which some foresee in distinguishing unambigiously between ABM radars and other types of radars such as early warning (e.g., BMEWS) space track, air defense and air traffic control. Large radars which embody all functions are technically feasible. Phased array radars are making duality of use a feasible design and operational objective, as in the case of the programmed U.S. air traffic control net. While a limitation on site radars used for local tracking and interceptor control, if agreed to in a manner to be verifiable, would provide the most effective restraint on ABM system effectiveness and growth, this generally smaller type of radar is the most difficult to identify and categorize. Smaller radars can be built under cover utilizing modular concepts, and highly capable mobile radars are within the state of the art. There are asymmetries between programmed U.S. and current Soviet ABM radars from the standpoint of numbers, type, function, and development which would make an agreement on equivalent capabilities difficult. Discussions may lead to disclosures of the need regarding plans, intent, characteristics, and operational capabilities. There is also concern that any ABM-associated radar restrictions which might be imposed may inhibit other needed radar research, development and deployment.

On the other hand, there are those who believe that ambiguities which might exist in distinguishing between ABM-associated and other radars are not great and should not prevent constraining ABM-associated radar in an agreement. The advocates of this position believe that there are specific indications which would permit us to distinguish ABM radars from other radars in most, if not all, cases. These indications include radar location, orientation, elevation angle, power, frequency and aperture size. For example, ABM-associated radars might be distinguished from space radars by location and orientation and from air-traffic control radars by power-aperture-product and frequency. They cite in support of their contention the very large numbers of radars of various types that presently exist in the Soviet Union and the fact that the U.S. has had, to date, no real difficulty in distinguishing the ABM-associated radars from the many other types.

The advocates of including radar restrictions suggest that it would be possible, after agreement is reached on allowed numbers of ABM interceptors, for each side to prescribe the radar infrastructure which it deems necessary to support its allowed interceptor deployment. Because of differences in geography, Nth country considerations, radar characteristics, and operating doctrine there would be some differences in the radar infrastructure of the two sides. These would be negotiated to assure that no gross redundancies existed. Monitoring of compliance would be by national means based on agreed technical definitions (based on the criteria set forth above) of what would constitute an ABM-capable radar.

It is also useful to observe that the problems resulting from radar ambiguities is of minor importance under a total ABM ban or with very low levels of ABM (Safeguard Phase I) and grows in difficulty only when the agreement provides for numbers of interceptors large enough to provide for nationwide perimeter acquisition radar coverage. This results from the fact that acquisition radars (Henhouse, Doghouse, PAR) are unambigiously visible; they are also essential to any meaningful ABM system.

Thus, under a zero ABM agreement, where acquisition radars would be entirely disallowed, clandestine construction of an ABM infrastructure would be inhibited. Under a low-level ABM agreement, where only partial acquisition radar coverage is provided, there is again little problem because of the relative vulnerability of these radars, and because filling the coverage gaps with additional acquisition radar would be unambigiously observed.

If, however, the agreed ABM limits were to permit nationwide defense of attacks from all threat corridors, then it might not serve any useful purpose to include limits on acquisition and early warning radars. If a nation is to provide an effective ABM defense of all its territory, it must be able to acquire targets that approach through any feasible threat corridor. This, for example, would be done with the planned U.S. PARs in the complete Safeguard system (with the exception of the southern corridor). However, once all threat corridors are covered by PAR-type radars, redundancy with the more advanced type radars would provide little additional capability, except perhaps to reduce vulnerability to attack on the radars. Thus there would be little need to constrain PAR-type radars in this situation. In such a case, the major risk from redundant ABM radars would come from those radars whose task is to guide the ABM interceptors and possibly provide final target tracking (e.g., U.S. MSRs, Soviet Triads). If limits on ABM radars were confined to those radars whose characteristics provide this kind of capability, both the danger of planned abrogation and/or SAM upgrade and the problem of distinguishing between ABM-associated radars and other radars could still be significantly reduced.

Issues

a. Should limits on ABM systems include limits on ABM-associated radars?

b. If there are to be limits on ABM-associated radars, should acquisition and early warning radars be executed?

J. Qualitative Limits

Weapon systems can be limited quantitatively or both quantitatively and qualitatively. There are some who believe that quantitative limits are all we should seek and all we could realistically hope to achieve. They believe that it is impossible to check the qualitative growth of weapons technology and that attempts to constrain the use of new technology in strategic weapons systems would be risky and would lead to agreements whose viability would be threatened by suspicion of violation and fear of abrogation. They hold that as new weapons become more effective it may be possible to check unnecessary growth in overall strategic capabilities by reducing forces to smaller numbers of more effective weapons.

Others, however, believe that such an approach to strategic arms control would be dangerously inadequate. They agree that it is not feasible to prohibit research and development on strategic weapons systems, but they believe that it is feasible and desirable to constrain this activity by limiting missile flight tests and that limiting such tests would provide an adequate, verifiable constraint on the introduction of significant qualitative improvements. They hold that the uncertainties which drive the arms race and create strategic instabilities that could increase the chances of strategic nuclear war are more a function of weapons quality than weapons quantity. It is the belief of this group that if weapons quality is not constrained, at least in some important aspects, the effect would be not to halt the arms race, but simply to drive it into new destabilizing and costly channels. Strategic force budgetary requirements would probably continue to grow at an accelerating rate and significant budgetary savings would not be realized. They argue that Soviet agreement would be unlikely if a U.S. proposal would require them to maintain or increase their spending for strategic forces in order to keep up with the U.S. Furthermore, they believe that the Soviets would be unlikely to accept an agreement which halted their quantitative approach to increased strategic capabilities and left the U.S. qualitative approach unconstrained. Even though they would be permitted the same option, the Soviets may well believe that, at least in the short run, they would be at a disadvantage in competing with the U.S. in a qualitative arms race.

Those who believe that realization of our strategic arms control objectives requires qualitative as well as quantitative controls generally agree that a quantitative freeze might have preceded a comprehensive qualitative freeze a year ago. However they argue that now the time-urgent MIRV flight-test problem (see para. M below) virtually rules out this phased approach. Furthermore, they believe that a combined quantitative and qualitative freeze is in some respects simpler than less comprehensive proposals and might prove to be the more readily negotiable approach and, if achieved, would meet our strategic arms control objective to a greater degree than would any partial freeze.

Those who believe that qualitative limitations are both feasible and serve U.S. interests consider that the central issue in this study and in negotiations with the Soviets is whether or not the U.S. will agree to a ban on MIRVs. However they also believe that additional qualitative restraints are desirable, feasible and verifiable and would enhance the value of an agreement for the U.S.

Therefore in addition to MIRVs and related systems (MRVs, maneuvering RVs and buses), consideration has been given to the feasibility and desirability of including other qualitative limitations in a strategic arms control agreement. The most important characteristics are those that might affect a nation's counterforce capabilities. These are discussed individually and are followed by a discussion of missile penetration aids (pen-aids) and the arms control implications of a more comprehensive freeze of the characteristics of offensive missiles.

1. Throw Weight

The throw weight of an offensive missile in general governs the maximum yield of the missile warhead and the potential capability of the missile for delivering MIRVs or penetrating defenses. The capability of a missile RV to destroy a hardened target is a function of both yield and accuracy. Thus if the throw weight of offensive missiles could be limited, the ability of a nation to improve its counterforce capability would be inhibited.

Throw weight restrictions might be imposed either with or without a MIRV ban. If imposed in addition to a MIRV ban, they would have the greatest inhibiting effect on the development of counterforce capability. With a MIRV ban there would also be less motivation to increase throw weight since the best counterforce ratio that could be achieved would still require at least one offensive missile to destroy one silo. However such restrictions might be worthwhile even in the absence of a MIRV ban since they would limit the total weight of MIRVs which would be placed on offensive missiles.

The current Soviet ICBMs possess a total throw weight greater than current U.S. ICBMs, due to the 12,500 lb. throw weight of the SS-9. If there were no constraints on the characteristics of missiles or silos, the U.S. could, in time, overcome this advantage, if it so desired. If ICBM silo size were to be constrained the Soviet potential for increasing the throw weight of their missiles is probably somewhat greater than that of the U.S., in absolute terms, particularly if the Soviets should use "cold launch" techniques. However, even with silo constraints the U.S. could improve on the current ratio of ICBM throw weights and gain in a relative sense.

However, unless the U.S. intends to initiate a counterforce strike, the throw weight threat should be viewed in absolute, not relative, terms. If the Soviets, by virtue of improved throw weights (or other improved characteristics), achieve the capability to destroy a major portion of the U.S. ICBM force, it would matter little whether we had or did not have a throw weight advantage. Therefore some believe that it would be in the U.S. interest to prohibit increases in throw weight. It would, of course, be more advantageous for the U.S. if a "throw weight freeze" could be made effective after the introduction of Minuteman IIIs and Poseidons with their improved throw weights, but it is unlikely that the Soviets would agree to such a measure.

If powered-flight telemetry is available, changes in payload carrying capability of greater than about 10 percent would be detected after one or two firings. Radar intelligence could detect changes on the order of 25 percent in actual payload weight, but confirmation might not be possible until after several firings.

2. Accuracy

In addition to yield and number of warheads, the accuracy of the warheads delivered also contributes directly to a nation's offensive missile first strike counterforce capabilities. Accuracy in turn depends primarily on the Beta (sharpness-bluntness) of the RV, the quality of the boost phase guidance and, possibly, the post boost maneuvering (as in terminal guidance systems) and the fuzing of the RV. (The arms control implications of RV maneuvering are discussed in para. 3 following.)

Beta affects accuracy in that since lower Beta (more blunt) RVs penetrate the atmosphere at slower speeds, they are more subject to atmospheric perturbations and winds, and are thus less accurate. If reentry telemetry is available to impact, we can verify Beta restrictions. ICBMs are the only missiles from which we obtain such reentry telemetry at present, but future collection systems should allow intercept on all test ranges. Radint on Pacific firings also would allow verification in lieu of telemetry.

The Soviet RVs generally have lower Betas (are more blunt) than U.S. RVs. Even current U.S. RVs do not have the high Betas required for the accuracy we are designing into our new MIRVed systems. The MIRVed RVs will have Betas significantly greater than current RVs. Thus if an agreement were to stipulate that Betas could not be improved (and maneuvering of RVs were prohibited in connection with prohibiting MIRVs) an effective limit on achievable accuracy could be established which would serve to restrain the silo-destruction capability of the missiles. Analysis conducted in connection with this study shows that, if Soviet Betas could not be improved, if terminal guidance and maneuver were not used, and ICBM launchers were limited to the present number and mix, the accuracies of their missiles could not be improved sufficiently to prevent about half the U.S. Minuteman force from surviving a first strike.

It would be possible to even improve this survival rate if, in addition to Betas, improvements in boost phase guidance systems were prohibited. We could expect to observe with national verification systems changes in the guidance systems and/or guidance techniques. Development of high accuracy probably can be verified by national means, particularly with future collection systems, but the degree of accuracy attained might not be known. Therefore, if changing the guidance systems on existing missiles and the introduction of new missiles were both prohibited, then this element of accuracy could also probably be effectively constrained. However, since the Soviets use radio-inertial guidance systems, boost-phase accuracy improvements might be feasible with no apparent system change.

3. Maneuvering Reentry Vehicles

Maneuvering reentry vehicles (MaRVs) can be used for three purposes, to provide independent RV targeting (as in a "P-ball" MIRV system), to improve accuracy (as in terminal guidance systems) or to penetrate ABM defense (by making ABM intercept more difficult). The use of maneuvering RVs is not currently programmed for any U.S. missiles. However the U.S. is conducting R&D on several new RVs which would employ maneuvering either for improved accuracy or for penetration or both. The U.S. is not now considering the development of a "P-ball" MIRV system. There is no evidence that the Soviets have developed or flight tested any MaRVs.

There would be no restrictions on MaRVs unless MIRVs were to be banned. Some believe that if MIRVs are banned then MaRVs should be permitted for penetration purposes, particularly as a hedge against abrogation of the ABM limits or illegal upgrading of SAM systems. Others believe that if MIRVs are banned it would be essential to ban MaRVs in order to inhibit Soviet development of "P-ball" type MIRVs. Even though the testing of multiple warheads (MRVs) would presumably be prohibited if MIRVs are banned, it might be possible for the Soviets to gain valuable test data for a "P-ball" MIRV system by flight testing the "P-ball" MIRVed RVs one at a time. In addition the proponents of banning MaRVs point out that if ABMs are prohibited or limited to low levels, as they must be in a MIRV ban, there would be no requirement for MaRVs as an aid to penetrate ABM defenses. However MaRVs could also be used to improve accuracy (or even if not designed for this purpose could be perceived to have this purpose). Thus if the Soviets were willing to prohibit or impose low limits on ABMs, they might well perceive U.S. insistence on permitting MaRVs as an indication of a U.S. intent to improve its counterforce capability. Furthermore if MaRVs are not prohibited, the Soviets could greatly improve the accuracy and thus the counterforce capability of their SS-11s, in spite of that system's low Beta.

4. Orbital Systems

The U.S. has no plans to develop orbital offensive missile systems. The Soviets have flight tested the SS-X-6 in a fractional orbital missile system mode (FOBS) and in a depressed trajectory ICBM mode (DICBM). While there is a better than even chance that they will deploy such a system, no confident estimate can be made as to the nature or number that might be deployed nor in fact when the type of system being developed will reach IOC.

With current warning systems, orbital missile systems can reduce the warning time available to the attacked forces by coming in below the full range of radar coverage or by attacking from directions not covered by warning radars. This advantage must be paid for by a reduction in the total payload and accuracy which the booster could otherwise deliver if used as an ICBM. Orbital systems are not now accurate enough to pose a threat to hardened silos. Thus orbital systems would be useful primarily as a counterforce weapon to destroy bombers before they can take off, other time-urgent soft targets, and ABM radars.

However planned improvements in U.S. warning systems expected to be operational by mid-1971 will increase the warning time against a FOBS attack. After that FOBS missiles would probably pose less of a threat than a similar missile in an ICBM mode. However the U.S. may wish to consider proposing prohibiting further flight testing of FOBS and related systems (e.g., depressed trajectory delivery) as a bargaining point in connection with a discussion of MIRV limitations. In any case the U.S. should make it clear that the agreed limits on Soviet ICBM launchers would include any FOBS or related systems the Soviets may wish to deploy.

5. ABMs

Since the "quality" of U.S. ABM systems is not yet established and the Soviets appear to be developing improved ABM interceptors, it might prove difficult to place a qualitative limit on ABMs at this time. However if a ban on MIRVs and other offensive missile characteristics were to be agreed, then consideration should be given to the desirability and feasibility of placing qualitative limits on ABMs as well. Since a MIRV ban would have to be accompanied by limitations on ABMs to very low levels, the most feasible "qualitative limit" might be to prohibit ABM systems altogether. If this is not feasible then technical limits (e.g., fly out range, missile size) would have to be developed which could prevent erosion in deterrent power through the gradual qualitative growth in ABM capability.

6. Missile Penetration Aids

The U.S. has developed and tested penetration aids for Minuteman I, Minuteman II and Polaris A-3 and is currently testing pen-aids for Minuteman III. Exoatmospheric pen-aid packages have been produced for the Minuteman I and II but have been deployed on only a few Minuteman II. A new exoatmospheric pen-aid system for Minuteman II is now under development. Both exo and endoatmospheric pen-aids have been developed for Minuteman III and are now being flight tested. Both exo and endoatmospheric pen-aids for Polaris A-3 have been developed and flight tested. However, procurement of pen-aid packages for A-3 is not currently programmed. There are no pen-aids packages for Polaris A-2 and Poseidon. The Soviets are not known to have penetration aids for any of their missiles although they are judged to have the capability to develop them.

Exoatmospheric penetration aids would provide a valuable hedge against the erosion of either side's assured deterrent through the planned abrogation of the agreed controls on ABMs or the illegal upgrading of SAM systems. Endoatmospheric pen-aids, while they would provide a hedge against the same type threats, are not as important as exoatmospheric pen-aids. Given reasonably low levels of ABMs, it is unlikely that there would be a significant commitment of the permitted ABMs to terminal defense of cities. Most "urban" defense interceptors would probably be area interceptors designed with only exoatmospheric capability. Any upgraded SAM system would be far more likely to have exoatmospheric than endoatmospheric capabilities. However, the main purpose for excluding endoatmospheric pen-aids (i.e., decoys designed to resemble RV's during re-entry) would be to preclude the possibility that multiple RV's would be illegally flight tested and our national verification means would not be able to distinguish between MRVs and endoatmospheric pen-aids. Therefore in an agreement which bans MIRVs, it would be desirable to prohibit the deployment and flight testing of endoatmospheric pen-aids but not exoatmospheric pen-aids.

Since the U.S. does not now have enough exoatmospheric pen-aids deployed it is not in the U.S. interest to freeze the exoatmospheric penetration-aid situation as it exists today. The U.S. desires to be able to deploy exoatmospheric penetration-aids if it believes circumstances so warrant. The Soviets might well wish the same option. Since exoatmospheric penetration-aids would have little effect on a nation that is abiding by the ABM limits of the agreement (under the assumption that under a MIRV ban such levels of ABMs permitted, if any, would be essentially anti-Nth country or anti-accidental launch) such an option would not be destabilizing.

7. A Comprehensive Qualitative Freeze

We have also considered the feasibility and desirability of seeking agreement on a comprehensive qualitative freeze to accompany a quantitative freeze. This would involve prohibiting changes or improvements in the characteristics of deployed strategic missiles except for minor internal changes in deployed missiles or launchers, such as those designed to improve missile reliability or RV hardening.

There are differences of opinion as to the advantages and disadvantages of such a limitation. Some believe that such a measure would be too sweeping and difficult to verify. Others, however, believe that such a measure would provide the most secure, stable and verifiable strategic arms control agreement. They point out that under such an arrangement there would be no requirement for further developmental missile flight testing and hence all flight tests, except for an agreed number of pre-announced confidence firings on agreed ranges, could be prohibited. Thus the use of national intelligence means could be focused on those few permitted firings to assure that no new characteristics were being tested. If MIRVs are to be prohibited, the most verifiable way to prohibit them would be as part of a comprehensive qualitative freeze.

Those who support this concept point out that such a freeze would provide other important advantages. While a MIRV ban alone would inhibit the development of a counterforce threat to U.S. ICBMs, a comprehensive characteristics freeze would prevent it. A comprehensive characteristics freeze would also provide greater strategic stability by reducing uncertainties as to the other side's strategic capabilities. On the other hand, some believe that by limiting the leeway for responses it would have the opposite effect of engendering concern on either side that secret developments could tip the balance.

Those who support a comprehensive qualitative freeze believe that such a proposal, which would essentially involve stopping the strategic arms race completely, may well be the most simple and thus the most negotiable meaningful arms control agreement. It would be likely to have greater international political impact (including encouraging adherence to the NPT), than narrower, technically circumscribed agreements. By eliminating the loopholes which would permit continuous incorporation of improvements in strategic systems and thus reducing the requirements to "hedge," such an agreement would probably save more resources than any other considered.

Issues

a. Should throw weight of offensive missiles be limited?

b. Should improvements in the accuracy of offensive missiles be prohibited?

c. Should maneuverable RV testing and incorporation in the missile force be prohibited?

d. Should FOBS and related systems be limited?

e. Should endoatmospheric pen-aids be prohibited?

f. In addition to a quantitative freeze, should the U.S. seek a comprehensive qualitative freeze?

K. Bombers

Bombers are a weapon system which the U.S. has emphasized in the past and in which it holds a technological lead over the Soviets. Bombers provide a hedge in retaliatory capability provided they receive adequate warning to ensure pre-launch survivability. This would be particularly crucial in situations where large ballistic missile defenses threatened the effectiveness of our missile forces.

The U.S. has a significant advantage in numbers of heavy bombers (581 B-52s and B-58s vs. 140-150 Soviet Bears and Bisons and 45-55 Bisons configured as tankers) and a far superior heavy bomber capability due to greater numbers of tankers (over 600 KC-135s) and experience in their use. The U.S. does not have a counterpart to the Soviet fleet of medium bombers (675-750 Badgers and Blinders in the Soviet Long Range Air Force) some of which could strike the U.S., if they were used on one way missions. U.S. programs currently call for reductions in the numbers of heavy bombers during the next five years. We estimate that the Soviets will also be reducing their heavy and medium bomber forces in the absence of an arms control agreement.

Bombers generally do not pose a counterforce threat in the context of general nuclear war since sufficient warning can be obtained to permit launching retaliatory forces before bombers are in position to release their weapons. (An exception could be the use of bombers in connection with missile pin-down tactics.) It is true, however, that a larger percentage of a nation's bomber force could probably be launched on a first strike than the number which would probably survive a first strike and be available for a retaliatory strike. The use of strategic bombers in an urban attack role in a first strike could permit the allocation of all or a major part of a nation's missile force to the counterforce role.

Although they have a superior air-defense force, the Soviets will undoubtedly consider that U.S. bomber superiority carries with it certain disadvantages for or threats against the Soviet Union. In addition, since U.S. public statements made last summer concerning SALT referred to our seeking limitations on "strategic nuclear delivery vehicles" and since our 1964 "freeze" proposal included bombers, the Soviets may well insist that any strategic arms control agreement must limit bombers as well as missiles.

The difficulty with limits on numbers of bombers is primarily one of definition. Should "bombers" include only long-range bombers capable of two-way missions or should the term include other aircraft such as the Soviet Long Range Air Force medium bombers, U.S. carrier attack aircraft, Soviet naval bombers, U.S. fighter bombers capable of performing a strategic mission, and "strategic" bombers adapted for conventional warfare (e.g., U.S. B-52s in Viet Nam)? There is also a question of the possible clandestine modification of large commercial aircraft to give them weapons delivery capabilities.

However, the number of aircraft, air defense radars, and surface-to-air missiles which a nation possesses are not very good indicators of bomber or air defense capabilities. The performance characteristics which the bombers and their air-to-surface missiles have against the opposing air defenses are more important. Thus it can be expected that the Soviets will seek qualitative as well as quantitative limits on strategic bombers. Since the Soviets do not appear to be developing a new strategic bomber, and they must know that the U.S. is seriously considering production and deployment of AMSA, it is likely that, as a minimum, they would seek restrictions which would prohibit the introduction of new bomber models. Even though we estimate that the Soviets are developing a new 350 nm air-to-surface missile (ASM) for their bombers, they may believe that the U.S. SRAM, SCAD and SCUD would give the U.S. bomber force a further advantage and hence seek to limit ASMs as well.

The problems of definition and verification are even greater for characteristics than for the systems themselves. Nevertheless, bombers limitations might have to be considered because the Soviets might insist on it or because we might want to limit air defense radars and SAMs to help prevent their clandestine use for ABM defense. It is highly unlikely that the Soviets would agree to limit bomber defenses without corresponding limits on bombers.

If agreement could be reached as to what type of aircraft were to be limited, it is probable that a limitation on numbers alone could be verified with high confidence by national means alone. However, it would be difficult to verify compliance with restrictions on qualitative improvements in bombers or their armaments unless these were made as simple as prohibiting the introduction of new bomber models. We would have high confidence in our ability to detect a Soviet bomber or ASM development program with national means alone.

In view of these definition and verification difficulties and the problems of limiting bomber defenses (see para. L following), it may be desirable to omit bomber limitations from the initial U.S. proposal, and restrictions on these were not included in any of the options evaluated. However, in spite of these complicating issues, we probably cannot long avoid discussion of bomber limitations in SALT.

Issues

a. Should the U.S. proposal include limits on the numbers of strategic bombers?

b. If the U.S. proposal does not include limits on bombers, should the U.S. agree to include such if the Soviets insist?

c. If bombers are to be limited, should the introduction of new models be prohibited?

L. Bomber Defenses

There are two reasons why it might be necessary or desirable to limit bomber defenses. First is the possibility that surface-to-air missile (SAM) systems could conceivably be upgraded to give them limited ABM capabilities. Secondly, it would probably be desirable to accompany any limitation of strategic bombers with limitations on the defenses they must penetrate.

If bombers are not limited, the potential threat of SAM upgrade may not be sufficient to warrant proposing limitations on SAMs. However, if the Soviets should insist on bomber limitations, then the number of SAM launchers should also be limited. An agreement should also make clear that upgrading SAMs to give them ABM capabilities would be prohibited.

However the use of SAMs for tactical as well as strategic defense might complicate attempts to limit their number. Both the U.S. and the Soviet Union use the same SAM systems (e.g., U.S. - Nike Hercules, Hawks; USSR - SA-2, SA-3) for strategic air defense of their homelands and tactical air defense of their forces and installations deployed outside national boundaries. In foreign areas SAM systems under U.S. or Soviet control are often intermingled with similar systems deployed by their allies. Thus, as a practical matter, it may be desirable to restrict limits on SAMs to those present in the homeland of each country.

The other important element of bomber defenses is the fighter-interceptor. It might be difficult to distinguish between fighter-interceptors, which it would be desirable to limit (if bombers were limited) and fighter-bombers which we might not desire to limit. If bombers are to be limited there are differences of opinion as to whether or not fighter-interceptors should also be limited.

If bomber defenses were limited, we would have high confidence in our ability to verify with national means alone the order-of-battles of fixed defensive missiles (SAMs), fighter aircraft, air-defense radars and prototypes of new defensive missile systems. We would have less confidence in our ability to detect the capabilities of new defensive missile systems prior to IOC. If a SAM system were converted to an ABM system, such extensive changes would be required that some would almost certainly be detected and probably identified as such before their initial operational capability (IOC).

Issues

a. Should the U.S. propose that the number of SAMs be limited, regardless of whether or not numbers of bombers are to be limited?

b. If numbers of bombers are to be limited, should numbers of fighter-interceptors as well as other air defense systems also be limited?

M. Suspension of Certain Weapons Testing and Deployment

Present strategic deployments constitute a situation in which neither side can strike first without receiving unacceptable damage in retaliation. Hence an agreement to freeze deployments close to present levels would be mutually advantageous for both the U.S. and the Soviet Union. The time required for negotiation of a strategic arms control agreement, however, could well permit additional deployments which would alter this balance and make realization of an agreement far more difficult; if not impossible; for many years to come. What must be considered, therefore, is whether or not certain critical testing and/or deployments should be suspended until such time as negotiators have been afforded a fair opportunity to explore the prospects for agreement.

If it is decided that the U.S. will not seek or agree to ban MIRVs, then the suspension, from the U.S. point of view, need only concern the continued Soviet initiation of the construction of missile launchers on which the U.S. proposes to place numerical limits (under Option I, fixed and mobile ICBMs and IR/MRBMs and ABMs; under Option II and III, fixed and mobile ICBMs and IR/MRBMs, SLBMs, SLCMs and ABMs). Soviet launcher construction starts have been running at a rate of about 200 ICBM silos and six Polaris-type submarines per year. Continuation of these programs much beyond the levels projected for 1 July 1969 might provide the Soviets higher levels of these types of launchers (if they were allowed to complete those under construction) then the U.S. would be willing to accept. While there are no indications that the Soviets intend in the immediate future to initiate the production of mobile ICBMs or IR/MRBMs or to add to their inventory of ABMs, fixed IR/MRBM silos or SLCM submarines, initiation of any new construction in these areas during SALT could make agreement more difficult.

Therefore the U.S. should propose either prior to the initiation of SALT or at the beginning of these negotiations, that the initiations of the construction of additional offensive missile launchers, fixed or mobile, land or sea based, be suspended. Whether or not, from the U.S. point of view, ABMs should be included is a moot point. However if the Soviets did not intend to initiate ABM deployments but they believed we did, then they would certainly insist on suspending ABM launcher construction, and perhaps even ABM radar construction. If the roles were reversed, then we might want to have the Soviets suspend ABM launcher and radar construction depending on what level of ABMs we sought. If neither side planned to deploy any ABM launchers or radars during the period of suspension, it would not be necessary to include ABMs in the suspension.

However, the prospects of achieving a suspension of missile launcher construction alone are not good since, with the possible exception of ABMs and/or our Polaris-Poseidon conversion program, they would affect only ongoing Soviet programs and would not constrain U.S. qualitative improvement programs. If agreement could be reached rapidly or agreed levels of missiles established without regard for existing levels, Soviet failure to agree to the suspension would not be critical. But if the Soviets agreed only to freeze with whatever they had (plus those under construction) on the effective date of the agreement, a Soviet failure to suspend those programs could seriously jeopardize the prospects for agreement.

One view of Soviet intentions concludes that what the Soviets would probably demand in return for a construction-start freeze, would be a MIRV flight test freeze. Even if the U.S. should decide that a MIRV ban should not be included in the opening U.S. position, the Soviets may well insist that MIRVs be dealt with in any formal agreement. Thus the prospects for <u>any</u> strategic arms control agreement may rest on our willingness to deal with MIRVs.

Whether or not the U.S. should seek a suspension of MIRV flight testing and, if so, when, is controversial. Some believe that failure to complete U.S. tests would forclose a U.S. opportunity to achieve an advantage that would be possible if tests were not banned until after the U.S. had developed its MIRV technology. They contend that the advanced stage of MIRV development within the Poseidon and Minuteman III programs may represent a negotiating strong point for the United States and believe that a U.S. initiative to place a moratorium or ban upon MIRVs may have an ill effect upon the progress of negotiations. They hold that such a proposal, if considered necessary, should be placed in a context to force the Soviets to early, reasonable negotiations. This may best be served, they believe, by continuing the present MIRV development, including flight testing, and possibly offering U.S. discussion of the problem when and if certain other substantive progress has been made.

Others believe, however, that if the U.S. continues its MIRV flight testing program to the point at which we would attain a deployable MIRV capability, or sufficiently to be perceived by Soviet planners to have attained such a capability, then the Soviets would be unlikely to agree to halting MIRV flight testing until they could achieve a similar capability. If a Soviet MIRV flight test program were to proceed to the point where we might perceive a deployable Soviet MIRV capability, then our confidence in depending for verification on a ban of further MIRV flight testing would be significantly eroded. The proponents of an early MIRV flight test suspension believe that U.S. MIRV flight testing has proceeded too far to permit the U.S. to use this as a bargaining tool once negotiations have begun. There are some officials connected with the U.S. MIRV program who believe that if the U.S. continues its current MIRV test schedule through July it might be able to achieve a capability to deploy MIRVs. The Soviets might perceive such a U.S. capability at an even earlier date. Some competent U.S. authorities believe that development could be completed satisfactorily without further flight testing, although with some delay and additional expenses.

In addition, if the U.S. carries out its scheduled MIRV tests, an apparent acceleration in the rate of testing will occur in the near future. The Soviets might view this as an indication that the U.S. did not intend to deal with MIRVs in SALT, that the U.S. was trying to pressure them into early or unfavorable agreement, or that the U.S. was trying to complete as many MIRV tests as possible before an agreement could be negotiated. This could cause an unfortunate reaction in the Soviet attitude toward SALT, in their own deployment and testing programs, or both.

The Soviets have been flight testing multiple warheads for their SS-9 ICBM. While it is generally considered that what the Soviets have tested so far is not a MIRV, it could conceivably be the precursor to a MIRV testing program. However, contrary to the National Intelligence estimate, some believe that the payload recently tested on the SS-9 could be a crude redimentary "MIRV" based on MRV techniques. A MIRV development suspension, therefore, should as a minimum, include further MIRV flight testing by either side. It is also desirable to suspend further flight testing of the Soviet SS-9 multiple re-entry vehicle missile (MRV). If possible, the suspension should not include all MRV test flights since this would preclude confidence firings of the currently deployed Polaris A-3 missile. However, if the Soviets should insist on suspending all MRV flight tests, it might be possible to flight test the Polaris A-3 with a single re-entry vehicle.

Issues

a. Should the U.S. unilaterally suspend or stretch out its MIRV flight testing program either with or without asking for Soviet reciprocation?

b. Should the U.S. propose a joint suspension of flight testing and/or launcher construction?

c. If so, what elements should be included in the joint suspension or in the request for Soviet reciprocation?

d. If the U.S. is to unilaterally suspend or stretch out its MIRV flight testing or to propose a joint suspension, when should this be done?

e. If a joint suspension is to be negotiated, what duration, if any, should be specified?

SECTION V. ILLUSTRATIVE ARMS CONTROL PACKAGES

A. INTRODUCTION

The preceding section of this paper described the salient elements that should be considered for inclusion in a strategic arms limitation agreement, and highlighted the key issues on which decisions must be made in order to develop a U.S. negotiating position. In order to present information on the interactions among these elements, this section examines several alternative packages incorporating various combinations of strategic arms limitations.

The weapon system limitations described in Section IV could be combined in a great many ways. Since it was feasible to analyze only a limited number of these combinations, we designated four packages of offensive missile limitations, with three variants, to illustrate the implications of a range of resulting force postures. These packages are not being presented as the only alternatives from which a preferred U.S. position might necessarily be selected; in fact, the analyses made after the initial designation of these packages may well indicate that a different combination of elements would be preferable to any of them.

None of these four illustrative packages includes the following elements: Missile throw-weight and accuracy restrictions, bomber limitations, air-defense limitations, and force reductions. None of the packages includes a specific designation of ABM level, although a range of different ABM levels was analyzed for each package.

An additional ABM variant (the option to vary the mix of land-based and sea-based ABM launchers) was analyzed. This additional ABM variant is implicit in Packages I and II and was examined as an additional excursion to Package III-B.

A package leaving ABM's completely unconstrained and limiting offensive systems only was considered but not evaluated for the following reason. Although it may be possible in theory to design a strategic balance in which both sides have such strong defensive capabilities and such limited offensive capabilities that neither need fear attack, we are unable to set forth any feasible arms control scenario which could accomplish the transition to such a relationship during the next several years without excessive risk to U.S. security during the transition period. Consequently, we have examined only possible arms control force postures designed to preserve strategic stability by maintaining a deterrent with a retaliatory capability* on each side.

Four illustrative packages of offensive missile limitations, with three variants, are described below, along with advantages and disadvantages of each. (A more detailed description of each package is contained in Annex A, Tab A.) The statements on advantages and disadvantages are based largely on the strategic analyses, political analyses, and verification capabilities summarized in this section and described in greater detail in Section IV and in the annexes to this report.

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* Throughout this report the term "retaliatory capability" refers to a capability to destroy urban and industrial targets in a second strike. (See Section C-2-a below.)

B. DESCRIPTION OF PACKAGES

Package I. Freeze of Numbers of Land-Based Offensive Missile Launchers

This package concentrates on land-based strategic missile systems, and puts no constraints on sea-based offensive missiles. It would ban mobile land-based strategic offensive missiles and freeze the numbers of ICBM and IRBM/MRBM launchers at existing levels (including those under construction). There would be no restrictions on MIRV's or on any other improvements of ICBM's or their launchers. Silo superhardening and silo relocation would be permitted. There would be some limit on the number of ABM launchers, but no restrictions on the characteristics of ABM systems.

Package II. Freeze of Numbers of Offensive Missile Launchers

This package would be more restrictive than Package I in that the number of sea-based strategic offensive missile launchers would be limited to existing levels (including those under construction). However, it would be less restrictive than Package I in that mobile ICBM's would be permitted within the total number of permitted ICBM launchers. Mobile IRBM's/MRBM's would be prohibited, but MIRV's and other qualitative improvements would be allowed as under Package I. Silo superhardening and silo relocation would be permitted. There would be some limit on the number of ABM launchers, but no restrictions on the characteristics of ABM systems.

Package II-A. Variant: Freeze of Sum of ICBM and SLBM Launchers

This package is identical to Package II, except that the total combined number of ICBM and SLBM launchers, existing or under construction, would be frozen. Within that overall ceiling, each side would be permitted to vary the mix of mobile or fixed land-based and sea-based (submarine or surface ship) offensive ballistic missile launchers as desired.

Package III. Freeze of Numbers and Certain Types of Offensive Missile Launchers with MIRV's Allowed

This package would freeze the respective numbers of land-based and sea-based strategic offensive missile launchers at existing levels (including those under construction). Mobile land-based missiles would be prohibited. MIRV testing and deployment would be allowed, but there would be a ban on enlarging existing silos, changing the basic external configuration of silos and other launchers, and the relocation of launchers. Sea-based and land-mobile ABM's would be prohibited. There would be no other restrictions on the characteristics of ABM systems. There would be some limit on the number of ABM launchers. Arrangements would be negotiated for replacing submarines after five years.

Package III-A. Superhardening Variant

This package is identical to Package III, except that hard-rock superhardening and relocation of ICBM silos would be permitted.

Package III-B. Variant: Freeze of Sum of ICBM and SLBM Launchers

This package is identical to Package III, except that the total combined number of ICBM and SLBM launchers, existing or under construction, would be frozen. Within that overall ceiling, each side would be permitted to vary the mix of fixed land-based and sea-based offensive ballistic missile launchers as desired.

Package IV. Freeze of Numbers and Certain Types of Offensive Missile Launchers with MIRV's Prohibited

This package is identical to Package III, except that multiple independently targeted reentry vehicles (MIRV's) would be totally prohibited. There would be a ban on further flight-testing of MIRV's (including any post-boost maneuvering and the testing of any multiple reentry vehicles), maneuvering reentry vehicles (MaRV's), fractional and multiple orbital weapon systems (FOBS and MOBS), and depressed trajectory ICBM's. The improvement or flight-testing of other offensive missile system characteristics would not be restricted. While this package would prohibit deployment of MIRV's, it would not prohibit deployment in launchers of the above-listed non-MIRV missile systems for which further flight-testing is prohibited.

C. Summary of Strategic Analysis

1. Introduction

This section summarizes an analysis of the four arms control packages and their variants to determine how they might affect U.S. and Soviet strategic force capabilities. A primary objective was to determine whether any of the packages would offer the Soviets an opportunity to increase their capability significantly by building up their forces under each package. Additionally, U.S. capabilities were analyzed to see whether they would be sensitive to Soviet cheating or abrogation. The selective results are intended to show both the extent to which objectives identified below could be met, and the confidence we would have in so meeting them. The detailed calculations and force structures are in the appended Report of the Strategic Analysis Panel (hereafter Panel Report), Annex A.

2. Criteria

Several complementary measures were used to assess the capabilities of U.S. and Soviet forces:

a. Deterrence. Measures of the deterrent capability of U.S. and Soviet forces help us assess the likelihood that a nuclear war will start. These include:

(1) The capability of U.S. strategic forces to inflict urban/industrial damage on the Soviet Union in retaliation after a Soviet surprise all-counterforce attack on U.S. strategic forces. We assume that Soviet forces are generated, while ours are on day-to-day alert, and that the Soviets use all their missiles in the counterforce strike. When ABM's are deployed, the U.S. is assumed not to use

pen-aids in order to provide a pessimistic estimate of its retaliatory capability. We evaluate urban/industrial damage in terms of prompt deaths and in terms of industrial capacity destroyed. We term this measure our retaliatory capability.

(2) The capability of Soviet strategic forces to inflict urban/industrial damage on the United States in retaliation after a U.S. surprise all counterforce attack on Soviet strategic forces. This is termed the Soviet retaliatory capability. In this case, U.S. forces are generated, the Soviet forces are on day-to-day alert, and the U.S. uses all its missiles in the counterforce attack. We assume that the U.S. uses pen-aids in its preemptive strike in order to provide a pessimistic estimate of the Soviet retaliatory capability.

(3) The relative number of U.S. and Soviet deaths in a nuclear war started by either a Soviet or U.S. first strike. We do these calculations for a range of scenarios involving mixes of counterforce and countervalue attacks by the side striking first, and an all countervalue attack by the retaliator. The forces of both sides are assumed to be generated.

(4) Stability in a crisis. We measure this by the number of people either nation can save by making a preemptive first strike designed to maximize the difference in fatalities, as compared to first undergoing a similarly designed first strike by the other side.

b. Damage Limiting. Measures of damage-limiting capability for U.S. and Soviet forces help us assess the capability of these forces to fight a nuclear war if deterrence should fail. They include the following:

(1) The capability of U.S. strategic forces to limit damage in a nuclear war initiated by the Soviets in which they attempt to maximize the difference between U.S. and Soviet fatalities.

(2) The capability of U.S. strategic forces to minimize U.S. fatalities by initiating a nuclear war.

c. Military Targeting. The deterrence and damage-limiting measures discussed above provide estimates of theoretical abilities to cause and/or limit fatalities in hypothetical scenarios which assume that each side targets its entire weapon inventory either against the other side's urban complexes or against strategic nuclear weapons which pose a direct threat to its own cities. In the event deterrence were to fail, it is unlikely that either side would allocate all its weapons in this fashion. Each side would doubtlessly allocate some weapons to military targets other than strategic weapons, such as command and control sites, defensive sites, and targets threatening its allies. Also, each side would like to have, if possible, some nuclear forces remaining at the termination of hostilities. The capability of U.S. or Soviet strategic forces to accomplish objectives such as these can be partially measured by determining how many nuclear weapons would be remaining after first setting aside a minimum number needed to cause a preselected amount of urban/industrial damage. This measure is expressed in terms of numbers of RV's and Megaton Equivalents remaining and in the number of military targets which these numbers might be able to destroy.

3. Assumptions and Limitations

In interpreting the numerical results presented, the reader should be aware that these results are dependent on various assumptions, some of which are explicitly stated and some of which are implied in the computer models used. Consequently, these results do not measure precisely the absolute levels of damage which could be expected to result from a nuclear war; rather, they should be used as approximate indicators of magnitude of damage and to reveal trends which could be expected as the force postures, levels of defense, and clandestine deployment of weapons are varied.

The damage criteria used in these calculations are due to blast effects only and do not take into account secondary effects, such as fallout, which could be expected. In those calculations involving ballistic missile defense, the models employed assumed a high level of effectiveness for the ABM systems and thus biased the results in favor of the defender. However, it is judged that the results show the trend of the impact of varying levels of ABM on each side's retaliatory capability.

The detailed assumptions and models used in making the calculations are for the most part the same as those used in the Department of Defense Report on Analysis of Alternative Nuclear Strategies and Force Postures in response to NSSM-3. Tabs H and I of the Panel Report explain these models and assumptions and discuss some limitations.

For purposes of this analysis, CIA provided projections of Soviet forces which assumed that the Soviets would seek to maximize their offensive missile capabilities within the constraints of the package to the extent that they could do so without actually increasing the levels of expenditure for strategic forces. Underlying these pessimistic projections was the assumption that actual Soviet force levels would probably fall well below these levels, particularly if the agreement appeared to offer the Soviets an opportunity to avoid major new programs without weakening the relative strength and capabilities of Soviet forces.

These projected Soviet forces were matched against currently programmed U.S. forces as constrained for the various force packages. No effort was made to take account of possible changes in the U.S. force posture in reaction to the high Soviet force levels projected.

In order to arrive at results which would be illustrative for the packages under consideration, a number of assumptions were used. Since bomber forces were not limited in any package, it was assumed in the analysis that U.S. strategic bombers levelled off at the presently programmed 345, while the Soviet strategic bombers levelled off at the high NIPP estimate of 50 by 1978. The U.S. SLBM force at sea was considered invulnerable during the period. In many cases, BMD effectiveness would be sensitive to the defense employed and the effectiveness of missile penetration aids. While no Soviet forces were set aside for Nth country contingencies, the U.S. forces set aside for the CPR are somewhat less than that in current targeting plans. In our counterforce calculations, only the SMIPET model included IRBM's/MRBM's and medium bomber bases as targets. Since we address specific packages and variants, we can expect that as the range of packages is narrowed, or as features of the various packages are combined, further analysis will be required.

4. Summary of Packages and Forces

The following table summarizes the limitations for each of the arms control packages.

Table C-1

SUMMARY OF ALTERNATIVE ARMS CONTROL PACKAGES

..G.	OFFENSIVE WEAPONS						DEFENSIVE WEAPONS		
	ICBMs		SLBMs & SLCMs	IR/MRBMs	MIRVs	BOMBERS	ABM a/		AIR DEFENSE
	Fixed	Mobile					Fixed	Mobile	
I	F	B	U	F	U	U	L	L	U
II b/	F	L d/	F	F	U	U	L	L	U
III b/	F c/	B	F c/	F	U	U	L	B	U
IV	F	B	F	F	B	U	L	B	U

Key F - Numbers frozen at current levels
B - Banned
L - Limited to agreed numbers
U - Unconstrained

a/ Various levels of ABM ranging from 0 to 5000 interceptors were examined for each package

b/ A variant of these packages allowed freedom to mix between ICBM's & SLBM's within the total number of allowed missiles

c/ Relocation of the missiles to new launchers was prohibited under the basic package, but allowed as a variant to this package

d/ Mobile ICBM's would be permitted within the total number of permitted ICBM launchers.

The following two tables compare presently programmed U.S. forces with pessimistic projections of the strategic forces which the Soviets could develop by 1978 with and without an agreement.

Table C-2

COMPARISON OF U.S. AND SOVIET STRATEGIC OFFENSIVE FORCES
(End of Fiscal Years)

	United States		Soviet Union					
		Programmed Force and All Packages	1969	1978				
				High	Packages			
Operational Forces	1969	1978		NIPP	I	II	III	IV
Long-Range Bombers	581	397	150	50	50	50	50	50
Soft ICBM Launchers	0	0	142	0	0	0	136	136
Hard ICBM Launchers	1054	1027	914	1346	1296	1198	1164	1164
Mobile ICBM Launchers	0	0	0	150	0	100	0	0
Soft IR/MRBM Launchers	0	0	538	0	538	538	538	538
Hard IR/MRBM Launchers	0	0	135	485	135	135	135	135
Mobile IR/MRBM Launchers	0	0	0	200	0	0	0	0
SLBM Launchers	656	656	208	896	1262	462	462	462
Long-Range SLCM Launchers	0	0	0	0	0	254	254	254
Short-Range SLCM Launchers	0	0	365	330	64	64	64	64

Table C-3

U.S. AND SOVIET STRATEGIC DEFENSIVE FORCES (1978)

Operational ABM Launchers	United States: Phase I SAFEGUARD	United States: Programmed full SAFEGUARD	United States: Packages I II III IV	Soviet Union: No Agreement; High and Low NIPP Projections	Soviet Union: Under Agreement; Packages I II III IV
Area	60	465	(Level Varies)	464-1064	(Level Varies)
Terminal	36	414		0-600	

5. Specific Issues

We discuss below several issues which are common to all packages considered in this study. This discussion is intended to provide a framework to assist in evaluating the four packages and their variants. Tables C-4a and C-4b summarize U.S. and Soviet retaliatory capabilities for each of the packages and variants for a range of ABM levels.

a. Level of Ballistic Missile Defense. Both the U.S. and the Soviets should become less confident of their retaliatory capabilities as the allowed level of ballistic missile defense increases. While a part of each side's retaliatory force is considered to be invulnerable to a first strike by offensive missiles, all of the offensive missiles launched in retaliation are subject to attrition by area or terminal ballistic missile defenses of cities. For this reason, limitation of ABM levels is one of the most critical issues in evaluating a proposed arms control agreement. When MIRV's are banned and missile penetration aids are not relied upon, U.S. retaliatory capabilities would be reduced to below 30% with bombers and 26% without bombers if there were ABM levels of the order of 500. Higher ABM levels (approaching 1500) would reduce the U.S. retaliatory capability to 25% with bombers and less than 10% without. Medium and high levels of ABM deployment also jeopardize the Soviet retaliatory capability when U.S. programmed and CIA postulated Soviet MIRV's are used. This indicates that the Soviets may be interested in keeping ABM's at a low level. If a MIRV ban is achieved, both sides should consider the desirability of a low ceiling (200 or less) on ABM deployment, so as to preclude the necessity for heavy reliance on missile penetration aids or bombers to maintain retaliatory capability.

It should be emphasized that Table C-4 does not indicate that the Soviets would have a significantly greater capability to limit damage to themselves by a first strike if there is a MIRV ban. For example, in the damage-limiting scenario, with 500 ABM's permitted under a MIRV ban (Package IV), the Soviets lose 124 million in prompt fatalities if they strike first; with the same number of area ABM's permitted without a MIRV ban, they lose 132 million (see pages G-20 and G-35 of Panel Report).

Table C-4a

U.S. RETALIATORY CAPABILITY a/ - 1978
(Percent of Total Soviet Population Killed by Prompt Nuclear Effects)

	Under Agreement (Level of Area ABMs)					No Agreement
	0	200	500	1000	2000	
U.S. Programmed Forces vs Soviet High NIPP						40
Package I	41	41	39	37	34	
Package I (with 192 ULMs added to US SLBM force)	43	42	42			
Package III	40	40	39	37	34	
ckage III-A (superhardening of silos permitted)	44		42			
Package III-B (freedom to replace 384 ICBMs with SLBMs)			44			
Package III (with 1920 terminal interceptors defending silos)			43			
Package IV (MIRVs banned)	38	33	29	25	24 b/	

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a/ Defined at pages C-1 - C-2 above.

b/ Only strategic bombers make this contribution. The missile forces were negated by the random nationwide area ABM model used; in reality, however, we could expect some additional fatalities due to missiles. If missile penetration aids were assumed to work, there would be yet more deaths from missiles. For the 1000 area ABM level under Package IV, bombers contributed 42% of the U.S. equivalent megatonnage delivered on the Soviet Union.

Table C-4b

SOVIET RETALIATORY CAPABILITY a/ - 1978
(Percent of Total U.S. Population Killed by Prompt Nuclear Effects)

	Under Agreement (Level of Area ABMs) 0	200	500	1000	2000	No Agreement
U.S. Programmed Forces vs Soviet High NIPP						33
Package I	51	47	41	25	4 c/	
Package I (with 192 ULMs added to US SLBM force)	49	45	37			
Package III b/	43	36	23	4 c/	4 c/	
ackage III-A (superhardening of silos permitted)	57		54			
Package III-B (freedom to replace 384 ICBMs with SLBMs)			40			
Package III (with 1920 terminal interceptors defending silos)			38			
Package IV (MIRV's banned)	54	49	40	15	4 c/	

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a/ Defined at pages C-1 - C-2 above.

b/ It should be emphasized that the higher Soviet retaliatory capability at low ABM levels under Packages I, III-B (superhardening), and IV, does not indicate that the Soviets would have a greater first-strike capability or a more significant damage-limiting capability than they would with Package III. For all war-fighting cases examined under the packages, the Soviets lost 110-140 million people after striking first.

c/ Only strategic bombers make these contributions.

b. MIRV's. The U.S. program to deploy MIRV's was formulated in the mid-60's in response to the requirement to be able to penetrate with higher confidence the large Soviet terminal ABM deployments which were estimated by the Intelligence Community at that time. The reasons for the Soviet initiation of their SS-9 MRV program are not known. Their tests followed our testing of ABM's and our initial decision to deploy the Sentinel ABM system. They could be taking the first steps toward developing a MIRV capability.

For retaliatory attacks against cities, the primary use of MIRV's is as a means of penetration against BMD. However, it is possible and even likely that advancing missile technology will enable both sides to develop accurate MIRV's. With this increased accuracy, it may be possible for both the U.S. and the Soviets to increase the counterforce capabilities of their ballistic missile forces. Although improved accuracy will also increase the kill probability of single warheads against hard targets, the MIRV capability allows a relatively small number of large payload missiles to threaten a larger number of hard targets and also provides for cross targeting.

For the force projections used, the Soviet retaliatory capability would be degraded more by MIRV's than the U.S. retaliatory capability. This is because a large number of the launchers in which we would deploy MIRV's--namely, Poseidon submarines which carry 10-14 warheads per booster--would be invulnerable to a first strike, even one in which the Soviets used MIRV's. The Soviet forces projected by the CIA for the mid-70's period do not include such large numbers of invulnerable MIRV's. It should be borne in mind, however, that the Soviets might eventually deploy large numbers of MIRV's on both their land-based and sea-based forces.

As shown in Table F-1 of Tab F of the Panel Report, the Soviets at the present time have a greater missile throw weight capability than the United States does. By using advanced launch techniques both sides could increase their missile throw weight by a factor of two to three within the constraints of present silo configurations as shown in Table F-2 of the Panel Report. This throw weight capability could be used to increase the MIRV payload within any of the first three packages. If MIRV's were banned, as they are in Package IV, there would be much less incentive to increase missile throw weight. This is because it would be extremely difficult for either side to acquire a first-strike capability merely by increasing the size of single warheads.

c. Pre-launch Survivability of Force Components. The vulnerabilities of the components of our strategic forces should be carefully considered as we prepare to negotiate an arms control agreement. As discussed above, advancing MIRV technology could make a large portion of our land-based missile silos more vulnerable to a counterforce first strike unless we took appropriate countermeasures. This is illustrated in Table C-5, which compares the pre-launch survivability of Soviet and U.S. ICBM's, assuming that the other side makes an all-counterforce first strike.

In these calculations, the assumptions were biased against the retaliator in order to furnish a conservative estimate of the opponent's capabilities. If MIRV's are permitted, the survivability of both countries' fixed ICBM forces is significantly lower than under Package IV. In order to increase the survivability of fixed ICBM forces threatened by MIRV's, the missiles would have to be superhardened, made mobile, or defended with medium to high levels of hard-point ABM defense. Under Package IV, which prohibits MIRV's, the achievement of an effective counterforce capability by either side against fixed ICBM's would be far less likely to occur by the mid-1970's. (Possible additional restrictions on missile accuracy and throw-weight

Table C-5

SURVIVABILITY OF LAND-BASED ICBM's

Area Inter-ceptors	HPD Inter-ceptors	Percent of Land-Based ICBMs Surviving a First Strike (1978)							
		Package III a/		Package III a/ Hard Rock Silos		Package III a/ Hard Point Def.		Package IVb	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Sovi
0	0	4	24	25	77			30	62
200	0	7	27					34	63
500	0	10	27	35	78			49	64
1000	0	18	28					77	71
0	640					16	30		
200	1280					28	33		
500	1920					48	35		

a/ U.S. CEPs for this case were: ICBMs (.25); SLBMs (.16). Soviet CEPs were: ICBMs (.25); SLBMs (.75).

b/ Soviet CEPs for this case were the same as under Package III. U.S. CEPs for this case were: ICBMs (.35); SLBMs (.80).

improvements, designed to further limit potential counterforce capabilities against U.S. Minutemen, are discussed in Section IV-J.) Thus, the prohibition of MIRV's can increase U.S. and Soviet confidence in their retaliatory capabilities, assuming a low level of area ABM's deployed by the other side.

If permitted under an agreement, the survivability of missile forces could also be increased by increasing ABM effectiveness through survivable sea-based mid-course interceptors or by replacing existing fixed ICBM's with mobile land-based or sea-based missiles. Analysis of these variants shows that they could provide increased survivability comparable to, or greater than, that shown in Table 5 for hard-rock silos and hard-point defense.

The vulnerability of our SLBM's is quite different from that of ICBM's. They might eventually be sensitive to advances in Soviet ASW or possibly to attacks on the command and control system. Our alert bombers, on the other hand, depend on adequate warning to ensure their pre-launch survivability. Thus, we have high confidence that the Soviets could not take action to destroy all three of our retaliatory components before launch. Our present approach to attaining our strategic objectives is to maintain a strong strategic capability to inflict damage with each of our three major force components, independently of the others. Planning conservatively, we do not wish to allow the vulnerability of even one system to provide a possible inducement for the Soviets to strike first. If an agreement allows MIRV's, our land-based ICBM's could become vulnerable unless the agreement also permitted our eventually taking steps to maintain their survivability.

d. Sensitivity to Soviet Cheating. Fears will inevitably arise that the Soviets can make us vulnerable to attack by secretly improving their offensive or, more importantly, their defensive forces. They could, of course, take the same steps in the absence of an agreement. Under an agreement, we would still pursue our own hedges to protect our retaliatory capability as we do now without an agreement. An agreement would reduce, but not eliminate, the uncertainties against which we would have to insure in any case. It could also reduce the range of hedges we could take to react to these uncertainties.

Table C-6 lists some hedges that are available to us and the packages under which they are permitted.

Table C-6

Hedges	Permitted for Packages
Increase bomber alert rate	All
Increase number of SCADs and SRAMs on bombers	All
Deploy improved exoatmospheric pen-aids	All
Deploy improved endoatmospheric pen-aids	I, II, III
Increase number of RV's on Poseidon	I, II, III
Increase number of Minuteman III (within agreed ICBM limits)	I, II, III
Put Minuteman in Hard Rock Silos	I, II, III-A
Move missiles to sea	I, II-A, III-B
Deploy more SLBMs	I
ıalitative Improvement	All, except where specifically prohibited.

The Report of the Verification Panel indicates that:

"we would almost certainly detect activities leading to a major change in Soviet strategic capabilities from those estimated or acknowledged at the time of the agreement.

"Although it is highly unlikely that any large-scale new deployment of their strategic forces could go undetected, the Soviets could effect minor increases without our detection."

The Report of the Verification Panel estimated upper bounds on the level of undetected cheating for offensive and defensive weapons and the time within which this cheating would most likely be detected. In the analysis which follows, we have tested cases in which both Soviet offensive and defensive cheating were first detected at higher levels and at a later time than indicated by these upper bounds, and which include reasonable combinations of cheating in more than one area. These assumptions are judged to represent a very conservative analysis of the impact of possible Soviet cheating. We found that our retaliatory capability is not significantly degraded even by these higher levels of detected Soviet cheating. For certain force levels possible within these packages, it would be prudent, upon entering an agreement, to pursue available hedges in order to be able to respond to evidence of Soviet cheating within the lead time required to maintain our retaliatory capability.

An excursion showed that at the 1500 ABM level, the U.S. second-strike capability with missiles only with the forces for Package III could be reduced to less than 5% if the Soviets should be able to develop and deploy effective mid-course ABM interceptors and were undetected in adding another 500 interceptors, and if U.S. penetration aids are assumed not to work. There would, of course, be an additional contribution to our retaliatory capability by our alert bombers.

6. Summary of Results by Package

a. Package I

This package left the SLBM forces on each side open-ended. The CIA projected a force of 1262 Soviet SLBM's for this package (vice 716 for Package III). The U.S. SLBM force was kept at the programmed level of 656 except for an excursion where 192 ULMS launchers were added.

Under arms control Package I, both the Soviet Union and the United States have a high retaliatory capability for levels of ballistic missile defense (BMD) up to 500 ABM launchers. For higher levels of BMD, the Soviet retaliatory capability drops rapidly, although they could maintain their retaliatory capability at a high level if they executed appropriate missile hedges permitted under this package or increased their strategic bomber force.

Neither side would have a distinct advantage in relative fatalities in a nuclear war, except at very high ABM levels, where the United States would have the advantage, provided the Soviets did not execute appropriate missile hedges or increase their bomber force.

Under this package, each side has little incentive to strike first in a crisis, provided the ABM level is 500 or less. For very high ABM levels, the United States could save 30 to 40 million people by striking first, again provided the Soviets did not develop effective missile penetration aids, execute appropriate missile hedges, or increase their bomber forces.

The U.S. damage-limiting capability for a Soviet first strike is small; even at a very high level of BMD, we could lose up to 95 million people. On the other hand, if the ABM level were very high and the U.S. struck first, U.S. prompt fatalities would be about 40 million, provided the Soviets made no increase in strategic bombers and did not execute missile hedges permitted.

The addition of 192 additional SLBM's to the U.S. forces, which is allowed under the package, increased the U.S. retaliatory capability by three to four percent and reduce the Soviet retaliatory capability by about the same amount.

b. Package II

The Soviet forces projected by the CIA for Packages II and III had very similar force levels and characteristics, except that those in Package II included 100 land-mobile ICBM's. In our analysis of Package III, we also examined an evasion case in which the Soviets deployed 500 land-based mobile ICBM's. We also examined several variations in the mix of sea- and land-based missiles. The results from these examinations would bracket those for Package II and Variant II-A.

c. Package III

The retaliatory capability of U.S. forces is high for all levels of BMD examined, even without missile penetration aids. At the higher levels of BMD, where our missiles suffer greater attrition from Soviet defenses, our bombers play a large role in carrying out the retaliatory strike. On the other hand, Soviet retaliatory capability, which includes only limited bomber forces, is high only if the ABM level is less than 500 launchers. Because there are fewer Soviet SLBM's in Package III as compared to Package I, the Soviet retaliatory capability is more sensitive to the ABM level in Package III than in Package I, assuming they do not execute permitted missile hedges or increase their strategic bomber force.

This same sensitivity of Soviet capabilities to ABM level is seen in the war-fighting results. In these scenarios, the Soviets received about the same level of damage from U.S. retaliatory and first strikes at all ABM levels. On the other hand, the United States saves 60 to 70 million lives by striking first in a crisis if there are more than 500 ABM launchers permitted by the agreement and if the Soviets did not develop effective missile penetration aids and did not increase their strategic bomber force. If the Soviets struck first, attempting to maximize the difference in fatalities, we could not limit fatalities to less than 90 million deaths, even with a large BMD. However, by striking first, the United States could limit damage to 20 million deaths if very high levels of ABM launchers were permitted and the Soviets made no increase in the strategic bomber force or did not execute permitted missile hedges.

In contrast to these cases, if large levels of ABM launchers were permitted, but only for hard-point defense of ICBM's, the United States cannot limit damage below 100 million deaths, even if we struck first. Similarly, the United States would have little incentive to strike first in a crisis if most of the allowed ABM launchers were used for hard-point defense. The U.S. and Soviet retaliatory capabilities both remain high in these cases.

For ABM launcher levels of 500 or less, neither side's capability to inflict fatalities in retaliation was affected significantly when superhard ICBM launchers were permitted (Variant III-A) or when there was freedom to vary the mixture of land-based and sea-based offensive missiles within a fixed overall level (Variant III-B). The contribution of measures of this kind is to hedge against circumstances other than this base case situation. If the Soviets retain their current posture, we could take steps such as hard-point defense, hard rock silos, or movement of ICBM's to sea that would reduce the number of U.S. missiles lost to a Soviet first strike. As a result, up to five times as many soft Soviet military targets could be destroyed in a U.S. second strike after holding back adequate weapons for 25% fatalities. The capability of either side to retaliate with missiles could be reduced if the side striking first had as many as 500 survivable mid-course interceptors and 1000 terminal interceptors, and the side striking second had 500 nationwide area interceptors and 1000 terminal interceptors. On the other hand, if both sides deployed 500 survivable mid-course interceptors and 1000 terminal interceptors, the Soviets would experience a significant reduction in second-strike capability, but the U.S. would not. It should be noted that the Soviets could achieve a mid-course intercept capability under Package III only if they should develop and deploy a forward, peripheral land-based ABM system. A U.S. mid-course intercept ABM capability would require sea-based ABM (permitted in Packages I and II only), or sites in Canada or Greenland, which may not be available to the U.S. In general, if either side decided to develop this area of technology, we do not expect that deployment of effective mid-course intercept ABM systems could occur before the mid- to late 1970's.

Several cases of detected Soviet cheating were examined, including deployment of additional ABM launchers, deployment of additional ICBM's, and conversion of air defense systems to a BMD. The U.S. retaliatory capability was adversely affected only in the case of a large-scale deployment of BMD systems at levels of cheating which we have high confidence of detecting and to which we made no response. Where our missiles suffer greater attrition from illegally deployed BMD systems, the U.S. retaliatory capability is significantly dependent upon the bomber force.

d. Package IV (No MIRV's)

In most cases examined, the computed measures of U.S. force effectiveness are not as good under Package IV as are the corresponding results under Package III. On the other hand, U.S. retaliatory capability still remains at least 25% for area ABM levels as high as 1000 and above 30% for ABM levels up to 200. Although Soviet retaliatory capability is better under Package IV than under Package III, the Soviets would not have the capability to limit damage to themselves under this package by striking first. These differences are enumerated in greater detail in Section IV of the Panel Report, Annex A.

The U.S. and Soviet retaliatory capabilities both become marginal if there are more than 500 area ABM interceptors and neither side depends upon missile penetration aids. However, at levels of 1000 ABM, if the U.S. strikes first using effective penetration aids and the Soviets do not have penetration aids, the Soviets retaliatory capability is degraded significantly. On the other hand, in a similar case with the Soviets striking first, the U.S. would retain its retaliatory capability.

At high levels of permitted ABM defense under Package IV, the U.S. retaliatory capability would rest on significant contributions from our bomber force if our missile penetration aids did not work. With 1000 area ABM's under a MIRV ban, nearly half of the detonating U.S. equivalent megatonnage is carried by bombers. With 2000 area ABM's permitted under a MIRV ban, 24% of the Soviet people could be killed with prompt nuclear effects, but bombers alone would make this contribution. Thus, at high levels of permitted ABM deployment, we would have lower confidence that there was redundancy in our retaliatory forces. But with low ABM levels under a MIRV ban we would have greater confidence that we had redundancy in our deterrent forces. This is because with MIRV's banned, a significantly higher percent of our land-based missiles survive than under Package III.

At low ABM levels, the United States does not have any significant damage-limiting capability when there are no MIRV's, regardless of which side strikes first. At the higher ABM levels, we could save up to 30 million deaths by striking first. At low levels of ABM, neither the Soviets nor the United States can save large numbers of people by striking first in a crisis.

Under Package IV, U.S. retaliatory capabilities are more sensitive to Soviet deployment of accurate ICBM's in excess of agreed limits than they are under Package III, particularly if the agreed level of BMD is more than 200 ABM launchers.

For an agreed ABM level of 200, the computed U.S. retaliatory capability dropped only from 33% to 29% under an assumption that the Soviets cheated by adding 700 accurate ICBM's before the U.S. could respond. For an agreed level of 500 ABM interceptors, the same offensive cheating caused the U.S. retaliatory capability to drop to 22%, with a greater reliance on bombers. However, for a Soviet ABM level of 1500 interceptors, achieved either through agreement or cheating, the same assumption on Soviet offensive cheating reduced the U.S. retaliatory capability to below 10%. On the other hand, the assumption of Soviet cheating by adding 500 less accurate ICBM's caused no change in U.S. retaliatory capability at 200 ABM's, and reduced it to 23% for 1500 ABM's.

In general, under Package IV our retaliatory capability would be somewhat more sensitive to ABM cheating than under Package III. Our retaliatory capability would not be significantly degraded as a result of examined cheating, however, if ABM levels are kept low under Package IV.

D. Verification of the Proposed Packages [1] [2]

The study of verification by national means of the provisions of each of the four alternative packages has led to the following observations. We assume that Soviet violations would be accompanied by attempts at concealment and deception.

Package I

Since this package concerns only fixed and mobile land-based strategic offensive missile launchers, it could be verified with high confidence provided there were clearly defined procedures for silo replacement. Without such procedures, replaced silos could not be verified as inoperable. Other than this, the major difficulty would be some uncertainty in verifying a ban on land-mobile strategic missiles. Under this package, for example, it is possible, although unlikely, that a Soviet attempt to build a force of 200 to 300 land-based mobile strategic launchers could go undetected for two to three years.

1/ A detailed assessment of our overall verification capabilities is provided in Annex B and SNIE 11-13-69.

2/ The assessment on the packages provided here does not include ABM because the force levels are as yet unspecified within the packages. A limitation on the number of fixed land-based and sea-based ABM launchers could be verified with high confidence. If land-mobile ABM's were permitted within the overall limit, our confidence of detecting a violation would be somewhat lessened. The primary effect of not limiting ABM radars would be to shorten the lead-time available to the U.S. in the event of a Soviet violation.

Package II

While the basic package would be verifiable, there would be a considerably lower level of confidence than in the case of Package I. The chief difficulty with this package would be the verification of the permitted mix of mobile and fixed (relocatable) ICBM's. The verification problem would be further complicated by the restriction on the number of SLBM launchers without a concomitant restriction on the number of submarines. Regarding replacement of fixed land-based and sea-based launchers, the verification complexities could be mitigated through clearly defined procedures for launcher replacement. There would be far greater difficulty in detecting a violation in a mixed ICBM force than would be the case if mobile ICBM's were banned. The variant to this package, which allows an interchange of land- and sea-based launchers, would further complicate this verification problem by extending the above weapons launchers mix.

Package III

The basic package could be verified with high confidence. It minimizes the difficulties of Packages I and II by prohibiting land-based mobile strategic launchers, the replacement of fixed silos, and further construction of SLBM launchers or submarines. The most difficult task in this package would be verifying the ban on land-mobile strategic launchers, the uncertainties surrounding which would be the same as that in Package I.

The two variants to this package would increase the verification difficulty owing to the land- and sea-based launcher mix and superhardening provisions. Despite the verification complexities, we still have high confidence of determining the eventual force levels in a mix of fixed land-based and sea-based launchers as would be permissible under

Variant III-B. Accordingly, the launcher mix in Variant III-B would be easier to verify than that in Variant II-A because it excludes a land-mobile system as part of land- and sea-based launchers. The difficulty of verifying the first variant (superhardening) is the same as that associated with launcher relocation and would be mitigated by clearly defined procedures for launcher replacement.

Package IV

The only differences from Package III[1/] are bans on testing and the deployment of MIRV's and the further flight-testing of all other specified reentry systems. Our capability to verify the testing of these reentry systems at present is good, and should improve over the period under consideration. Even with present verification systems, we have high confidence of timely detection of MIRV testing for ICBM's and a somewhat lesser level of confidence regarding shorter-range missiles. The chances of our detection of MIRV's for SLBM's are only about even. At present Package IV, as it applies to MIRVed ICBM's, could be verified with high confidence. If the Soviets complete RDT&E of a MIRV system prior to an agreement, verification of a ban on actual deployment of MIRV's would be difficult, if not impossible, by national means.

1/ As noted above, Package III could be verified with high confidence.

E. Negotiability

Despite the provisions in Packages I and II which would permit the Soviets to proceed with deployment of two of their important strategic programs (SLBM and land-mobile ICBM, respectively), the Soviets would nonetheless probably prefer Packages III and IV as being more comprehensive in reducing the costs, uncertainties, political tensions, and military risks of continued arms competition. If the Soviets prove to be interested in a MIRV ban, they would prefer Package IV between the two because it contains such a provision.

On the other hand, if we decided to consider a MIRV ban along the lines of Package IV, there might be a tactical advantage in entering negotiations with Package III, which asks maximum restrictions on Soviet offensive systems without restricting our MIRV program. If we were prepared, following initial negotiations and an exploration of Soviet views, to accept a restraint on MIRV testing while negotiations proceeded on an overall agreement, we would be in a good position to get the Soviets to agree to a conditional suspension of their own on-going programs (e.g., hold up construction starts on ICBM launchers and missile-launching submarines). The delays possible in such an approach could, however, render our MIRV program useless as a bargaining element should the MIRV testing program carry us past the point where a MIRV ban could be verified by national means. Package IV would avoid this problem.

We will not know the extent to which MIRV's may be critical to a successful outcome of negotiations until the Soviet attitude on MIRV's and, particularly, on their relation to ABM is better known.

F. ADVANTAGES AND DISADVANTAGES OF EACH PACKAGE

NOTE: In considering the advantages and disadvantages of each illustrative package, it should be borne in mind that a wide range of possible ABM levels was analyzed in each case. A key issue for decision is what level of ABM the U.S. should seek to negotiate. This decision is basic to evaluating the alternatives and determining a U.S. position. This decision both affects and is influenced by the other elements of each package.

Except where noted below, Soviet compliance with the various packages is verifiable with high confidence by national means alone. In some cases, however, an evasion might not be detected until some deployment had occurred; see Annex B.

PACKAGE I. FREEZE OF NUMBERS OF LAND BASED OFFENSIVE MISSILE LAUNCHERS.

Effect on Arms Race

PRO - By prohibiting land-mobile missiles and limiting fixed offensive missiles and ABM's, this package would create confidence and could be a first step toward curbing the strategic arms race without disrupting present U.S. military programs.

CON - Would curb the strategic arms race in only three major weapons categories, thereby probably channeling the race into other areas. Unless low limits on ABM levels could be agreed to, ABM's would drive offensive force buildups in unconstrained areas and thus create uncertainties and instabilities in the strategic relationship.

Strategic Balance

PRO - Would permit U.S. to take the actions necessary to retain a secure retaliatory capability at all ABM levels.

- Allowing each side to build more survivable systems (SLBM's) could increase stability.

CON - By permitting MIRV's and other missile improvements, would increase uncertainties and fail to reduce the counterforce threat to fixed ICBM's, which is foreseen for the mid-1970's. (See points under Package IV.)

- By permitting silo relocation or enlargement, this package would fail to prevent the Soviets from introducing SS-9's or a new generation of ICBM's in place of their small ICBM's.

- By permitting larger numbers of Soviet SLBM's, would increase the Soviet threat.

Negotiability

PRO - Could lead to a quick agreement, because it is relatively simple, would permit the Soviets to continue their SLBM program, and would freeze only numbers of ICBM launchers, in which the Soviets would have more than the U.S.

CON - Would probably not be negotiable because:

a. the Soviets would be unwilling to limit ABM's and two important potential Soviet offensive force programs (more ICBM's and land-mobile missiles) without limiting any projected U.S. offensive force programs, particularly MIRV's;

b. its limited scope would not meet Soviet desires to save money and to reduce potential strategic uncertainties;

c. the Soviets would not want to pay the political costs entailed in an agreement with the U.S. in exchange for so little arms control.

Verification

CON - Verification would require agreement on clearly defined procedures for fixed launcher replacement, thus increasing the difficulty of the negotiations. Without such procedures, replaced silos could not be verified as inoperable.

Other Factors

PRO - Minimizes incentives to cheat, since substantial increases in force capability can be made within the constraints.

PACKAGE II. FREEZE OF NUMBERS OF OFFENSIVE MISSILE LAUNCHERS.

Effect on Arms Race

PRO - Advantages similar to Package I (although Package II would not ban land-mobile ICBM's and would limit SLBM's.)

CON - By allowing land-mobile missiles, sea-based ABM's, MIRV's, etc., Package II would have only marginal effect on slowing the arms race, and would lead to dynamic buildups in both offensive and defensive strategic systems.

Strategic Balance

PRO - Advantages similar to Package I (although Package II limits SLBM totals.)

CON - Disadvantages similar to Package I (except for SLBM limits) with additional disadvantage that land-mobile missiles would add to strategic uncertainties.

Negotiability

PRO - Could lead to a quick agreement, because it is relatively simple, and permits the Soviets to deploy land-mobile ICBM's as a counter to U.S. MIRV's.

CON - Probably less negotiable than other packages because of its limited scope, complexities of tradeoffs, lack of a MIRV ban, and allowing the U.S. to deploy mobile land-based and sea-based ABM systems.

Verification

CON - More difficult to verify than Packages I, III, or IV, because land-mobile missiles are not banned. It would be far harder to determine the number of land-mobile missile launchers than to detect violation of a complete ban.

- Verification would require agreement at the time of negotiation on clearly defined procedures for replacement of SLBM, fixed ICBM and mobile ICBM launchers, thus increasing the difficulty of the negotiations. Without such procedures, replaced launchers could not be verified as inoperable.

- The permitted mix of fixed and mobile ICBM launchers further complicates the verification problem.

PACKAGE II-A VARIANT: FREEZE OF SUM OF ICBM AND SLBM LAUNCHERS.

This variant differs from Package II only in that it permits each side to build more sea-based missile launchers as a one-for-one replacement for ICBM launchers (or vice versa, which is unlikely).

PRO - Could enhance survivability of retaliatory forces.

- Permitted force flexibilities would discourage attempts to build counterforce capabilities.

- Otherwise advantages are similar to Package II

CON - Introduces an additional source of strategic uncertainties, since future force structures would be less predictable.

- Larger numbers of Soviet SLBM's could increase the threat to the U.S.

- Would add to verification difficulties because of the land-sea mix.

- Otherwise disadvantages are similar to Package II.

PACKAGE III. FREEZE OF NUMBERS AND CERTAIN TYPES OF OFFENSIVE MISSILE LAUNCHERS WITH MIRV's ALLOWED.

Effect on Arms Race

PRO - Would provide more comprehensive restrictions on arms race than Packages I and II, by banning land-mobile ICBM's and by limiting all categories of strategic offensive and defensive missile launchers.

CON - Would permit MIRV's and some other missile improvements, the responses to which would probably lead to a continuing qualitative arms competition within the constraints of the agreement (see Section IV-G).

Strategic Balance

PRO - Would allow each side to maintain adequate retaliatory capability, provided ABM levels are kept low.

- Would allow U.S. to maintain adequate retaliatory capability at all ABM levels considered.

- Would allow the U.S. to proceed with all its presently planned programs for improvement of its offensive strategic forces, while denying to the Soviets continuation of the ongoing increase in the size of their offensive forces.

- Would prevent Soviets from overcoming the current U.S. advantage in numbers of SLBM's and from deploying land-mobile ICBM's.

- Would allow application of new technology to each side's offensive missile force to enhance its effectiveness in target coverage and penetration and provide hedges against cheating or abrogation.

CON - By permitting MIRV's and other missile improvements, this package would increase uncertainties and fail to reduce the counterforce threat to fixed ICBM's, which is foreseen for the mid-1970's. (See points under Package IV.)

- Would not allow U.S. to deploy sea-based ABM.

Negotiability

PRO - It might be a good negotiating opener because it is sufficiently broad in scope that the Soviets would conclude that we are serious about SALT.

- They might be prepared to accept an agreement along these lines as a means of maintaining an acceptable strategic posture as measured by their standards.

CON - The Soviets might reject Package III because:

a. Would limit most Soviet programs but leave our principal program (MIRV) untouched. They probably would not see the ability to proceed with an MRV/MIRV program as sufficient compensation for this.

b. At medium and high levels of ABM's, Soviet retaliation capability could be degraded well below current levels.

- On the other hand, Package III might also make it difficult to negotiate low ABM levels (because of MIRV's not being banned and interest in hard-point defenses, etc.), thus leading to increased uncertainties in the strategic balance. (See Sections IV-G and IV-H.)

PACKAGE III-A. SUPERHARDENING VARIANT

This variant differs from Package III only in that it permits ICBM silo superhardening.

PRO - Would improve the stability of the strategic balance by making a counterforce attack more difficult.

- Would allow U.S. to increase its ICBM throw weight more than under Package III.

- Otherwise advantages are similar to Package III.

CON - Soviet superhardening could result in replacement of smaller silos with silos large enough for SS-9's or new generation missiles. This could threaten the survivability of the U.S. Minuteman force even if the latter were superhardened.

- Verification would require agreement on clearly defined procedures for silo replacement, thus increasing the difficulty of the negotiations.

- Would have other disadvantages listed under Package III above.

PACKAGE III-B. VARIANT: FREEZE OF SUM OF ICBM AND SLBM LAUNCHERS

Package III-B permits varying the mix of land-based and sea-based offensive strategic missiles as desired, similar to Package II-A. Hence it has consequent advantages and disadvantages similar to those listed above for Package II-A. Package III-B would be easier to verify than Package II-A, however, because the former bans land-mobile missiles. Since Package III places more restrictions upon offensive systems than does Package II, the advantages of the freedom to mix are greater under Package III-B than under Package II-A. In other respects, Package III-B has advantages and disadvantages similar to Package III.

PACKAGE IV. FREEZE OF NUMBERS AND CERTAIN TYPES OF OFFENSIVE MISSILE LAUNCHERS WITH MIRV's PROHIBITED

Effect on Arms Race

PRO - Because Package IV would ban MIRV's on both sides, it would prevent a major escalation in the offensive nuclear force levels on both sides.

- Would also eliminate pressures to respond to MIRV threats with land-mobile ICBM's, hard-point ABM defense, hard-rock silos, more SLBM's, etc.

- Package IV is the only one of the four which breaks the MIRV-ABM escalatory action-reaction cycle described in Section IV-G.

- If MIRV/MRV testing is not stopped soon, it will probably prove impossible to ban MIRV's later, because of verification difficulties (see Sections IV-G and IV-M).

CON - With no restrictions on improving missile accuracy or throw weight, this package permits non-MIRV improvements of offensive missile performance which could eventually threaten the survivability of each side's land-based missile force. (See Section IV-J for discussion of additional restrictions designed to solve this problem.)

Strategic Balance

PRO - Would allow each side to maintain its assured destruction capability provided ABM levels are kept low, and the latter would be much easier to do under a MIRV ban.

- Mitigates the destabilizing counterforce threat to survivability of fixed ICBM's which is foreseen for the mid-1970's.

- A ban on MIRV at the present time would leave the U.S. with a considerable technological lead, which the Soviets could have only limited success in narrowing with testing banned. Since a breakdown of the agreement would enable the U.S. to capitalize on this lead, and unless the Soviets have chosen a more limited approach to MIRV's and are satisfied with it, this consideration would add to Soviet incentives to live up to the terms of the agreement.

- An agreement based on Package IV would be a key step toward a quantitative and qualitative freeze of the strategic status quo. By suspending MIRV/MRV flight testing on both sides, it would avoid loss of the option to negotiate an agreement later for an essentially complete qualitative freeze.

CON - The ban on multiple and maneuvering RV's would reduce each side's capability to develop flexible means for ensuring penetration of ABM's. (For example, it would preclude further development of decoy RV's.) This could create uncertainties in the strategic balance and require significant hedging, particularly unless ABM capabilities are effectively limited to low levels.

- If the Soviet area ABM level were to exceed about 1000 effective interceptors, MIRV's were banned, and U.S. penetration aids were assumed ineffective, then the U.S. retaliatory capability would depend significantly on bombers.

- A low ABM level and a ban on SABMIS, in conjunction with a MIRV ban, could place constraints on U.S. ability to protect its population from possible future Chinese ICBM attack.

- In banning MIRV's, the U.S. would be failing to exploit a current technological lead over the U.S.S.R.

- Under Package IV, the U.S. retaliatory capability is more sensitive to possible Soviet cheating or technological advances than under the other packages.

- Would not allow U.S. to deploy sea-based ABM.

Negotiability

PRO - Would probably be more negotiable than the other packages because it comes closer to maintaining the strategic status quo, which the Soviets have indicated they wish to do.

- The U.S. would be more likely to succeed in persuading the Soviets to suspend ICBM and SLBM launcher construction early in the negotiations if we were prepared to link this with a simultaneous suspension of MIRV/MRV flight testing.

- Assuming the Soviets desire a MIRV ban, they may prove more willing to agree to limiting numbers of SLBM's and ICBM's, and banning land-mobile ICBM's, as a quid pro quo for banning MIRV's.

- With MIRV's banned, the Soviets might have strong strategic and economic incentives to agree to low limits on ABM's.

CON - The negotiations could take longer because of the additional provisions on restricting certain types of flight tests.

- Our desire to halt Soviet MRV flight testing soon could be an additional negotiating complication.

- If the Soviets want a MIRV ban, a U.S. initial proposal to ban MIRV's would forego significant bargaining potential without any assurance that the U.S.S.R. would accept the rest of the Package IV restrictions.

- On the other hand, the Soviets may not want to accept a MIRV ban until they have developed their own MIRV capability, especially since they could feel confident that the U.S. would not evade a MIRV ban at a later date.

- The Soviets may prove unwilling to limit ABM levels to low enough levels to satisfy U.S. requirements for a MIRV ban.

- If the U.S. decides to complete its current series of MIRV tests, Package IV may become impossible to negotiate, because the Soviets may prove unwilling to accept a MIRV ban which they can not verify by national means alone.

Verification

CON - Would not be verifiable if the Soviets had developed and tested MIRV's sufficiently to warrant deployment before an agreement were reached.

- Some believe the Soviets could achieve certain stages of MIRV development without flight testing; however, it is highly unlikely that they would deploy any such system without a full-range flight testing program, which we would identify.

Other Factors

PRO - U.S. budgetary savings could be greater than for the other three packages.

- Our European allies might prefer Package IV on the grounds that it is the one they consider most likely to prove negotiable, and thus the one most likely to head off potential developments they fear.*

CON - Our European allies might be concerned that without MIRV's we will not be able to target all the Soviet IR/MRBM's and other time-urgent NATO targets with missiles.*

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* These factors may be outweighed by other military and political concerns of our allies. See Part II of Annex C.

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REPORT OF THE STRATEGIC ANALYSIS PANEL

NSSM 28

May 10, 1969

ANNEX A

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REPORT OF THE STRATEGIC ANALYSIS PANEL

I. INTRODUCTION

This report analyzes the capabilities of U.S. and Soviet strategic forces under the four arms control options which the NSSM 28 Steering Committee directed that we study. a/ Additionally, U.S. capabilities are analyzed to see whether they would be sensitive to Soviet cheating or abrogation. The selective results are intended to show both the entent to which objectives identified below could be met, and the confidence we would have in so meeting them. The forces which are examined, and their costs, are shown in Tabs B through E.

Several complementary measures are used to assess the capabilities of U.S. and Soviet forces. We use two major criteria: deterrence and damage-limiting.

A. Deterrence. Measures of the deterrent capability of U.S. and Soviet forces help us assess the likelihood that a nuclear war will start. These include:

1. The capability of U.S. strategic forces to inflict urban/industrial damage on the Soviet Union in retaliation after a Soviet surprise all counterforce attack on U.S. strategic forces. We assume that Soviet forces are generated, while ours are on day-to-day alert, and that the Soviets use all their missiles in the counter-force strike. When ABM's are deployed the U.S. is assumed not to use pen-aids in order to provide a pessimistic estimate of its retaliatory capability. We evaluate urban/industrial damage in terms of prompt deaths and in terms of industrial capacity destroyed. We term this measure our retaliatory capability.

2. The capability of Soviet strategic forces to inflict urban/industrial damage on the United States in retaliation after a U.S. surprise all counterforce attack on Soviet strategic forces. This is termed the Soviet retaliatory capability. In this case, U.S. forces are generated, the Soviet forces are on day-to-day alert, and the U.S. uses all its missiles in the counterforce attack. We assume that the U.S. uses pen-aids in its pre-emptive strike in order to provide a pessimestic estimate of the Soviet retaliatory capability.

3. The relative number of U.S. and Soviet deaths in a nuclear war started by either a Soviet or U.S. first strike. We do these calculations for a range of scenarios involving mixes of counterforce and countervalue attacks by the side striking first, and an all countervalue attack by the retaliator. The forces of both sides are assumed to be generated.

4. Stability in a crisis. We measure this by the number of people either nation can save by making a pre-emptive first strike designed to maximize the difference in fatalities, as compared to first undergoing a similarly designed first strike by the other side.

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a/ These options are described in detail in Tab A.

B. Damage Limiting. Measures of damage-limiting capability for U.S. and Soviet forces help us assess the capability of these forces to fight a nuclear war if deterrence should fail. They include the following:

1. The capability of U.S. strategic forces to limit damage in a nuclear war initiated by the Soviets in which they attempt to maximize the difference between U.S. and Soviet fatalities.

2. The capability of U.S. strategic forces to minimize U.S. fatalities by initiating a nuclear war.

C. Military Targeting. The deterrence and damage limiting measures discussed above provide estimates of theoretical abilities to cause and/or limit fatalities in hypothetical scenarios which assume that each side targets its entire weapon inventory either against the other side's urban complexes or against strategic nuclear weapons which pose a direct threat to its own cities. In the event deterrence were to fail, it is unlikely that either side would allocate all its weapons in this fashion. Each side would doubtlessly allocate some weapons to military targets other than strategic weapons, such as command and control sites, defensive sites, and targets threatening its allies. Also, each side would like to have, if possible, some nuclear forces remaining at the termination of hostilities. The capability of U.S. or Soviet strategic forces to accomplish objectives such as these can be partially measured by determining how many nuclear weapons would be remaining after first setting aside a minimum number needed to cause a preselected amount of urban/industrial damage. This measure is expressed in terms of numbers of RVs and Megaton Equivalents remaining and in the number of military targets which these numbers might be able to destroy.

In interpreting the numerical results presented in this Study, the reader should be aware that these results are dependent on various assumptions, some of which are explicitly stated and some of which are implied in the computer models used. Consequently, these results do not measure the absolute levels of damage which could be expected to result from a nuclear war; rather, they should be used as approximate indicators of magnitude of damage and to reveal trends which could be expected as the force postures, levels of defense, and clandestine deployment of weapons are varied. The damage criteria used in those calculations are due to blast effects only and do not take into account secondary effects such as fallout which could be expected. In those calculations involving ballistic missile defense, the models employed assumed a high level of effectiveness for the ABM systems and thus biased the results in favor of the defender. However, it is judged that the results show the trend of the impact of varying levels of ABM on each side's retaliatory capability.

The detailed assumptions and models used in making the calculations are for the most part the same as those used in the Department of Defense Report on Analysis of Alternative Nuclear Strategies and Force Postures in response to NSSM 3. Tab I explains these models and assumptions and discusses some limitations; Tab H describes the SMIPET model, which was used in making some of the calculations for NSSM 28.

In order to arrive at results which would be illustrative for the options under consideration a number of assumptions were used. Different results might occur if the assumptions and estimates were different. For example, the Soviet threat was predicated upon CIA estimates of Soviet capabilities and responses ten years hence. The US SLBM force at sea was considered invulnerable during the period. In many cases BMD effectiveness would be sensitive to the defense employed and the effectiveness of missile penetration aids. While no Soviet forces were set aside for Nth country contingencies, the U.S. CPR "package" used is somewhat less than that in current targeting plans. In our counterforce calculations, only the SMIPET model included IRBMs/MRBMs and medium bomber bases as targets. Since we address specific options and variants as specified in Tab A, we can expect that as the range of options is narrowed, or as features of the various options are combined, further analysis will be required.

Section II discusses several issues which are common to the options, such as MIRVs and ABM levels. The next section presents a summary of results under each option, and Section IV summarizes the calculations. The tabs in the appendix include a description of the four options, U.S. and Soviet forces for each option, their costs, some static comparisons of U.S. and Soviet forces, the detailed results of the war-fighting calculations, and an analysis of force capabilities when considering military targeting.

II. SPECIFIC ISSUES

In this section, we discuss several issues which are common to all options considered in this study. This discussion is intended to provide a framework to assist in evaluating the four options and their variants. Table II-1 summarizes the features of these options.

A. Level of Ballistic Missile Defense. Both the U.S. and the Soviets should become less confident of their retaliatory capabilities as the allowed level of ballistic missile defense increases. A part of each side's retaliatory force is considered to be invulnerable to a first strike by offensive missiles, whereas all of the offensive missiles launched in retaliation are subject to attrition by area or terminal ballistic missile defenses of cities. For this reason, limitation of ballistic missile defense is one of the most critical issues in evaluating a proposed arms control agreement. When MIRVs are banned and missile penetration aids are not relied upon, the U.S. retaliatory capabilities would be reduced to below 30% with bombers and 26% without bombers if there were increases to ABM levels on the order of 500. Higher ABM levels (approaching 1500) would reduce the U.S. retaliatory capability to 25% with bombers and less than 10% without. Increases to medium and high levels of ABM deployment also jeopardize the Soviet retaliatory capability when U.S. programmed and CIA postulated Soviet MIRVs are used. This indicates that the Soviets may be interested in keeping ABMs at a low level. If a MIRV ban is achieved, both sides should consider the desirability of a low ceiling (200 or less) on ABM deployment, so as to preclude the necessity for heavy reliance on missile penetration aids or bombers to maintain its retaliatory capability.

Table II-1

SUMMARY OF ALTERNATIVE ARMS CONTROL OPTIONS

OPTION	OFFENSIVE WEAPONS						DEFENSIVE WEAPONS		
	ICBMs		SLBMs & SCBMs	IR/MRBMs	MIRVs	BOMBERS	ABM a/		AIR DEFENSE
	Fixed	Mobile					Fixed	Mobile	
I	F	B	U	F	U	U	L	L	U
II b/	F	F	F	F	U	U	L	L	U
III b/	F c/	B	F c/	F	U	U	L d/	B	U
IV	F	B	F	F	B	U	L	B	U

Key F - Numbers frozen at current levels
B - Banned
L - Limited to agreed numbers
U - Unconstrained

a/ Various levels of ABM ranging from 0 to 5000 interceptors were examined for each option

b/ A variant of these options allowed freedom to mix between ICBMs & SLBMs within the total number of allowed missiles

c/ Relocation of the missiles to new launchers was prohibited under the basic option, but allowed as a variant to this option

d/ A variant to option III allowed freedom to mix between land and sea-based ABMs within an agreed total level

Table II-2

U.S. AND SOVIET RETALIATORY CAPABILITY IN RELATION TO ABM LEVEL (Percent of Total Population Killed by Prompt Nuclear Effects)

	Level of Area ABMs				
	0	200	500	1000	2000
U.S. Retaliatory Capability a/					
Both Sides Deploy MIRV (Option III)	40	40	39	37	33
MIRVs Banned (Option IV)	38	33	29	25	24 b/
Soviet Retaliatory Capability c/					
Both Sides Deploy MIRV (Option III)	43	36	25	4	4
MIRVs Banned (Option IV)	54	49	40	15	4

a/ U.S. missile penetration aids are not relied upon.

b/ Only strategic bombers make this contribution. The missile forces were negated by the random nationwide area ABM model used; however, we could expect some additional fatalities due to missiles. If missile penetration aids were assumed to work, there would be additional deaths from missiles.

c/ There are no Soviet missile penetration aids.

B. MIRVs. The U.S. program to deploy MIRVs was formulated in the mid 60s in response to the requirement to be able to penetrate with higher confidence the large Soviet terminal ABM deployments which were estimated by the Intelligence Community at that time. The reasons for the Soviet initiation of their SS-9 MRV program are not known. Their tests followed our testing of ABMs and our initial decision to deploy the Sentinel ABM system. They could be taking the first steps toward developing a MIRV capability.

For retaliatory attacks against cities, the primary use of MIRVs is as a means of penetration of BMD. However, it is possible and even likely that advancing missile technology will enable both sides to develop accurate MIRVs. With this increased accuracy it may be possible for both the U.S. and the Soviets to increase the counterforce capabilities of their ballistic missile forces. Although improved accuracy will also increase the kill probability of single warheads against hard targets, the MIRV capability allows a relatively small number of large payload missiles to threaten a larger number of targets and also provides for cross targeting.

For the force projections used, the Soviet retaliatory capability would be degraded more by MIRVs than the U.S. retaliatory capability. This is because a large number of the launchers in which we would deploy MIRVs -- namely Poseidon submarines which carry 10-14 warheads per booster -- would be invulnerable to a first strike, even one in which the Soviets used MIRVs. The Soviet forces projected by the CIA for the mid-70 period do not include such large numbers of invulnerable MIRVs.

As shown in Table F-1 of Tab F the Soviets at the present time have a greater missile throw weight capability then the United States does. By using advanced launch techniques both sides could increase their missile throw weight by a factor of two to three within the constraints of present silo configurations as shown in Table F-2. This throw weight capability could be used to increase the MIRV payload within any of the first three options. If MIRVs were banned, as they are in Option IV, there would be much less incentive to increase missile throw weight. This is because it would be extremely difficult for either side to acquire a first-strike capability merely by increasing the size of single warheads.

C. Pre-launch Survivability of Force Components. The vulnerabilities of the components of our strategic forces should be carefully considered as we prepare to negotiate an arms control agreement. As discussed in the paragraphs above, advancing MIRV technology could make a large portion of our land-based missile silos more vulnerable to a counterforce first strike unless we took appropriate countermeasures. This is illustrated in table II-3, which compares the pre-launch survivability of Soviet and U.S. ICBMs, assuming that the other side makes an all-counterforce first strike.

In these calculations the assumptions were biased against the retaliator in order to furnish a conservative estimate of the opponent's capabilities. Under Option III, which allows MIRVs, the survivability of fixed ICBM forces is lower than in Option IV. In order to increase the survivability of the fixed ICBM forces, under this Option, either the missiles would have to be superhardened or defended with medium to high levels of hard point ABM defense. Under Option IV, which prohibits MIRVs, the achievement of an effective counterforce capability by either side against fixed ICBMs would be far less likely to occur by the mid-70's. Thus the prohibition of MIRVs can increase U.S. and Soviet confidence in their retaliatory capabilities, assuming a low level of area ABMs deployed by the other side.

Table II-3

SURVIVABILITY OF LAND-BASED ICBMs

Area Inter-ceptors	HPD Inter-ceptors	Percent of Land-Based ICBMs Surviving a First Strike (1978)							
		Option III a/		Option III a/ HRS		Option III a/ HPD		Option IV b	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S	Soviet
0	0	4	24	25	77			30	62
200	0	7	27					34	63
500	0	10	27	35	78			49	64
1000	0	18	28					77	71
0	640					16	30		
200	1280					28	33		
500	1920					48	35		

a/ U.S. CEPs for this case were: ICBMs (.25); SLBMs (.16). Soviet CEPs were: ICBMs (.25); SLBMs (.75).

b/ Soviet CEPs for this case were the same as under Option III. U.S. CEPs for this case were: ICBMs (.35); SLBMs (.80).

The survivability of missile forces could also be increased by increasing ABM effectiveness through survivable sea-based mid-course interceptors or by replacing existing fixed ICBMs with mobile or sea-based missiles. Analysis of these variants shows that they could provide increased survivability comparable to or greater than that shown in Table II-3 for hard rock silos and hard-point defense.

The vulnerability of our SLBMs is quite different. They may eventually be sensitive to advances in Soviet ASW or possibly to attacks on the command and control system. Our alert bombers on the other hand depend on adequate warning to ensure their pre-launch survivability. Thus, we have high confidence that the Soviets could not take action to destroy all three of our retaliatory components before launch. Our present approach to attaining our strategic objectives is to maintain a strong strategic capability to inflict damage with each of our three major force components independently of the others. Planning conservatively, we do not wish to allow the vulnerability of even one system to provide a possible inducement for the Soviets to strike first. If an agreement allows MIRVs, our land-based ICBMs could become vulnerable unless the agreement also permitted our eventually taking steps to maintain their survivability.

D. Limits on Strategic Bombers and Air Defenses. The proposed U.S. position on strategic arms limitations excludes consideration of bombers and air defenses for the following reasons:

1. We do not believe that bombers are a major threat to stability since they would not normally be planned for use in first strikes against time-urgent targets. It is easy to obtain several hours warning of a bomber attack -- enough time to launch strategic weapons before the bombers could damage them.

2. Defining "strategic bomber" in a way which simply and clearly distinguishes it from other types of aircraft is a very difficult problem. There are similar difficulties in distinguishing strategic air defense forces from tactical air defense forces.

3. Even if there were agreement on the bomber and air defense forces to be limited, verifying compliance would be difficult without some on-site inspection because of the mobility of the aircraft.

4. The actual number of aircraft, air defense radars, and surface-to-air missiles which a nation possesses are not very good indicators of bomber or air defense capabilities. The performance characteristics of the bombers (including air-to-surface missiles) against the opposing air defense systems are very important in determining net capabilities. The problems of definition and verification are even greater for performance characteristics than for the systems themselves.

Nevertheless, the U.S. might have to discuss bomber and air defense limitations with the Soviets. We might have to because the Soviets might insist on including such limitations on the agenda in the negotiations or they might require that bomber limitations be discussed if we want to limit systems in which they may be interested.

Although the uncertainties inherent in predicting the capabilities of future air defenses prohibit precise quantification of the effects of such agreements, one can state the following conclusions with reasonable confidence:

1. Previously calculations have shown that prohibiting qualitative improvements in the bomber force would mean that an advanced "look-down, shoot-down" interceptor defense could effectively limit the fatalities either side would receive to 5-10 million by FY77 in an attack using only bombers.

2. If qualitative improvements are allowed, previous calculations have shown that new Subsonic Cruise Armed Decoys (SCADs), Short-Range Attack Missiles (SRAMs), Bomber Defense Missiles (BDMs), and Electronic Countermeasures (ECM) would provide each side with the capability to kill 30-60 million people in an attack, using only bombers, even against the most sophisticated defenses either side might deploy in the next ten years.

Bombers are a weapon system which the U.S. has emphasized in the past and in which it holds a technological lead over the Soviets. Bombers on alert provide a hedge in retaliatory capability since they require only warning in order to be survivable. This would be particularly crucial in situations where large ballistic missile defenses threatened the effectiveness of our forces.

E. Sensitivity to Soviet Cheating. Fears will inevitably arise that the Soviets can make us vulnerable to attack by secretly improving their offensive or, more importantly, their defensive forces. They could, of course, take the same steps in the absence of an agreement. Under an agreement we would still pursue our own hedges to protect our retaliatory capability as we do now without an agreement. An agreement would reduce, but not eliminate, the uncertainties against which we would have to insure in any case.

The following table lists some hedges that are available to us and the options under which they are permitted.

Hedges	Permitted for Options
Increase bomber alert rate	All
Increase number of SCADs and SRAMs on bombers	All
Increase number of RVs on Poseidon	I, II, III
Increase number of Minuteman III (within agreed ICBM limits)	I, II, III
Put Minuteman in Hard Rock Silos	I, II, III-A
Move missiles to sea	I, II-A, III-B
Deploy more SLBMs	I
Qualitative Improvement	All, except where specifically prohibited.

A special intelligence analysis indicates that we can with high confidence detect relatively low levels of Soviet cheating in numbers of offensive or defensive weapons. In the analysis which follows, we have tested cases in which Soviet cheating was detected much later and at higher levels. These assumptions are judged to represent an upper bound on detected Soviet cheating cases, to include reasonable combinations of cheating in more than one area. We found that our retaliatory capability is not significantly degraded even by these higher levels of detected Soviet cheating. For certain force levels possible within these options it would be prudent, upon entering an agreement, to pursue the hedges that are available in order to be able to respond to evidence of Soviet cheating within the leadtime required to maintain our retaliatory capability.

An excursion showed that at the 1500 ABM level the U.S. Missiles Only second strike capability with the forces for Option III would be reduced to less than 5% if the Soviets used midcourse interceptors and were undetected in adding another 500 interceptors. There would, of course, be an additional contribution to our retaliatory capability by our alert bombers.

III. SUMMARY OF RESULTS

A. Option I

This option left the SLBM forces on each side open ended. The CIA projected a force of 1262 Soviet SLBMs for this option (vice 716 for Option III). The U.S. SLBM force was kept at the programmed level of 656 except for an excursion where 192 ULMS launchers were added.

Under arms control Option I, both the Soviet Union and the United States have a high retaliatory capability for levels of ballistic missile defense (BMD) up to 500 ABM launchers. For higher levels of BMD, the Soviet retaliatory capability drops rapidly, although they could maintain their retaliatory capability at a high level if they executed appropriate missile hedges permitted under this option or increased their strategic bomber force.

Neither side would have a distinct advantage in relative fatalities in a nuclear war, except at very high ABM levels, where the United States would have the advantage, provided the Soviets did not execute appropriate missile hedges or increase their bomber force.

Under this option each side has little incentive to strike first in a crisis, provided the ABM level is 500 or less. For very high ABM levels, the United States could save 30 to 40 million people by striking first, again provided the Soviets did not develop effective missile penetration aids or increase their bomber forces.

The U.S. damage limiting capability for a Soviet first strike is small; even at a very high level of BMD, we could lose up to 95 million people. On the other hand, if the ABM level were very high and the U.S. struck first, U.S. prompt fatalities would be about 40 million, provided the Soviets made no increase in strategic bombers or did not execute missile hedges permitted.

The addition of 192 additional SLBMs to the U.S. forces, which is allowed under the option, increased the U.S. retaliatory capability by three to four percent and reduced the Soviet retaliatory capability by about the same amount.

B. Option II

The Soviet forces projected by the CIA for Options II and III had very similar force levels and characteristics, except that those in Option II included 100 land-mobile ICBMs. In our analysis of Option III, we examined the case in which the Soviets added 500 land-mobile ICBMs. We also examined several variations in the mix of sea- and land-based missiles. The results from these examinations would bracket those for Option II and Variant II-A.

C. Option III

The retaliatory capability of U.S. forces is high for all levels of BMD examined, even without missile penetration aids. At the higher levels of BMD, where our missiles suffer greater attrition from Soviet defenses, our bombers play a large role in carrying out the retaliatory strike. On the other hand, Soviet retaliatory capability, which includes only limited bomber forces, is high only if the ABM level is less than 500 launchers. Because there are fewer Soviet SLBMs in Option III as compared to Option I, the Soviet retaliatory capability is more sensitive to the ABM level in Option III than in Option I, assuming they do not execute permitted missile hedges or increase their strategic bomber force.

This same sensitivity of Soviet capabilities to ABM level is seen in the war-fighting results. In these scenarios, the Soviets received about the same level of damage from U.S. retaliatory and first strikes at all ABM levels. On the other hand, the United States saves 60 to 70 million lives by striking first in a crisis if there are more than 500 ABM launchers permitted by the agreement and if the Soviets did not develop effective missile penetration aids and did not increase their strategic bomber force. If the Soviets struck first, attempting to maximize the difference in fatalities, we could not limit fatalities to less than 90 million deaths, even with a large BMD. However, by striking first, the United States could limit damage to 20 million deaths if very high levels of ABM launchers were permitted and the Soviets made no increase in the strategic bomber force or did not execute permitted missile hedges.

In contrast to these cases, if large levels of ABM launchers were permitted, but only for hard point defense of ICBMs, the United States cannot limit damage below 100 million deaths, even if we struck first. Similarly, the United States would have little incentive to strike first in a crisis if most of the allowed ABM launchers were used for hard point defense. The U.S. and Soviet retaliatory capabilities both remain high in these cases.

For ABM launcher levels of 500 or less, neither side's capability to inflict fatalities in retaliation was affected significantly when superhard ICBM launchers were permitted or when there was freedom to vary the mixture of land-based and sea-based offensive missiles within a fixed overall level. The contribution of measures of this kind is to hedge against circumstances other than this base case situation. If the Soviets retain their current posture, we could take steps such as hard point defense, hard rock silos, or movement of ICBMs to sea that would reduce the number of U.S. missiles lost to a Soviet first strike. As a result, up to five times as many soft Soviet military targets could be destroyed in a U.S. second strike after holding back adequate weapons for 25% fatalities. If there were freedom to vary the mixture of land-based and sea-based ABMs, the capability of either side to retaliate with missiles could be reduced if the side striking first had as many as 500 survivable midcourse interceptors and 1000 terminal interceptors, and the side striking second had 500 nationwide area interceptors and 1000 terminal interceptors. On the other hand, if both sides deployed 500 survivable midcourse interceptors and 1000 terminal interceptors, the Soviets would experience a significant reduction in second-strike capability, but the U.S. would not. It should be noted that the Soviets could achieve a mid-course intercept capability only if they should develop and deploy a forward, peripheral land-based or sea-based ABM.

Several cases of detected Soviet cheating were examined, including deploymen of additional ABM launchers, deployment of additional ICBMs, and conversion of air defense systems to a BMD. The U.S. retaliatory capability was adversely affected onl in the case of a large scale deployment of BMD systems at levels of cheating which we have high confidence of detecting and to which we made no response. Where our missiles suffer greater attrition from illegally deployed BMD systems, the U.S. retaliatory capability is significantly dependent upon the bomber force. On the other hand an excursion showed that at the 1500 ABM level the U.S. second-strike capability with missiles only would be reduced to less than 20% if the Soviets used midcourse interceptors and were undetected in adding another 500 interceptors.

D. Option IV (No MIRVs)

In most cases examined, the computed measures of U.S. force effectiveness are not as good under Option IV as are the corresponding results under Option III. On the other hand, U.S. retaliatory capability still remains at least 25% for area ABM levels as high as 1000 and above 30% for ABM levels up to 200. Although Soviet retaliatory capability is better under Option IV than under Option III, the Soviets would not have the capability to limit damage to themselves under this package by striking first. These differences are enumerated in greater detail in Paragraph 3c of Section IV.

The U.S. and Soviet retaliatory capabilities both become marginal if there are more than 500 area ABM interceptors and neither side depends upon missile penetration aids. However, at levels of 1000 ABM, if the U.S. strikes first using effective penetration aids and the Soviets did not have penetration aids, the Soviets retaliatory capability is degraded significantly. On the other hand, in a similar case with the Soviets striking first, the U.S. would retain its retaliatory capabilit

At high levels of permitted ABM defense under Option IV, the U.S. retaliato capability would rest on significant contributions from our bomber force if our missi penetration aids did not work. With 1000 area ABMs under a MIRV ban, nearly half of the detonating U.S. equivalent megatonnage is carried by bombers. With 2000 area AB permitted under a MIRV ban, 24% of the Soviet people could be killed with prompt nuclear effects, but bombers alone would make this contribution. Thus, at high leve of permitted ABM deployment, we would have lower confidence that there was redundanc in our retaliatory forces. But with low ABM levels under a MIRV ban we would have greater confidence that we had redundancy in our deterrent forces. This is because with MIRVs banned, a significantly higher percent of our land-based missiles survive than under Option III.

At low ABM levels, the United States does not have any significant damage limiting capability when there are no MIRVs, regardless of which side strikes first. At the higher ABM levels, we could save up to 30 million deaths by striking first. low levels of ABM, neither the Soviets nor the United States can save large numbers people by striking first in a crisis.

Under Option IV, U.S. retaliatory capabilities are more sensitive to Soviet deployment of ICBMs in excess of agreed limits than they are under Option III, parti ularly if the agreed level of BMD is more than 200 ABM launchers. In general, under Option IV, our retaliatory capability would be more sensitive to ABM cheating than under Option III. Our retaliatory capability would not be significantly degraded as a result of examined cheating, however, if ABM levels are kept low under Option IV.

For an agreed ABM level of 200 interceptors, the computed U.S. retaliatory capability only dropped from 33 percent to 29 percent under an assumption that the Soviets cheated by adding 700 accurate ICBMs before the U.S. could respond. For an agreed level of 500 ABM interceptors, the same offensive cheating caused the U.S. retaliatory capability to drop to 22%, with a greater reliance on bombers. However, for a Soviet ABM level of 1500 interceptors, achieved either through agreement or cheating, the same assumption on Soviet offensive cheating reduced the U.S. retaliatory capability to below 10%. On the other hand, the assumption of Soviet cheating by adding 500 less accurate ICBMs caused no change in U.S. retaliatory capability at 200 ABMs, and reduced it to 32% for 1500 ABMs.

IV. SUMMARY OF CALCULATIONS OF VARIOUS ARMS CONTROL OPTIONS

A. Effectiveness of U.S. Programmed Forces vs High NIPP (FY1978)

In order to compare results for the arms control options with expected results in the event of no agreement, the following information is presented for U.S. programmed forces versus the high NIPP forces.

1. Summary of Forces

	U.S.	Soviet
Total Forces (FY1978)		
Intercontinental Bombers (UE)	345	50
ICBM Launchers (Hard)	1027	1446
SLBM Launchers	656	830
Fighter Interceptors (Effective	266	2300

2. Retaliatory Capability

U.S. Retaliatory Capability	
Soviet Damage a/	
Fatalities	40%
Industrial Damage	66%
Soviet Retaliatory Capability	
U.S. Damage b/	
Fatalities	33%
Industrial Damage	34%

a/ Neither U.S. nor Soviets use missile penetration aids.
b/ U.S. uses missile penetration aids, Soviets do not.

3. War-fighting Results

Crisis Stability a/	
U.S.	32 Million U.S. Lives Saved
Soviet	-9 Million Soviet Lives Saved
Damage Limitation b/	
U.S. First Strike	87 Million U.S. Fatalities
Soviet First Strike	139 Million U.S. Fatalities
Relative Fatalities c/	4 Million

a/ Lives which can be saved by striking first in scenarios in which the side striking first attempts to maximize the difference between its fatalities and those on the other side.

b/ U.S. first strike missiles attack weapons only. Soviet first strike maximizes difference between U.S. and Soviet fatalities.

c/ Difference between U.S. and Soviet fatalities in a scenario in which Soviets strike first to maximize this difference. Negative values indicate Soviet fatalities are greater than U.S. fatalities.

B. Option 1

1. Summary of Option

Freeze on the number of land-based ICBM and IR/MRBM launchers.
Ban on land-mobile offensive strategic missile launchers.
Conversion of IR/MRBM launchers to ICBM launchers prohibited.
The allowed numbers of ABM launchers and interceptors will be agreed upon.
The number of SLBM launchers will not be frozen.
No limits on manned bombers and air defenses.

2. Summary of Forces

	U.S.	Soviet
Total Forces (FY1978)		
Intercontinental Bombers (UE)	345	50
ICBM Launchers (Hard)	1027	1296
SLBM Launchers	656(848*)	1262
Fighter Interceptors (Effective)	266	2300

* This excursion examined the effect of adding 192 additional SLBMs to U.S. forces.

3. Effectiveness

a. Retaliatory Capability

ABM Level		U.S. Retaliates - Soviet Damage (%) a/		Soviets Retaliate U.S. Damage (%) b/	
Area	Terminal	Deaths	Ind. Dam.	Deaths	Ind. Dam.
0	0	41	60	51	62
200	0	41	60	47	60
500	0	39	59	41	55
500	1000	37	58	16/23c/	30
500	2000	36	57	10*/19	27
1000	4000	32	55	4*/8	20

a/ Neither U.S. nor Soviets use missile penetration aids.
b/ U.S. uses missile penetration aids; Soviets do not.
c/ When two numbers are shown, the first represents the percentage of people killed when the attacker is required to kill at least 2/3 of the population in the defended cities. An asterisk indicates that it is not possible to meet the 2/3's requirement; the number shown then represents the percent of fatalities in the defended cities. The second number is the percentage of the population killed if the 2/3's requirement is removed.

b. War-fighting Results - U.S. Uses Missile Penetration Aids

ABM Level (No. Interceptors)		Crisis Stability Deaths a/		Damage Limitation U.S. Deaths b/		Relative Deaths c/
Area	Terminal	U.S.	Soviet	U.S. 1st Strike	Soviet 1st Strike	
0	0	3 M	3 M	127 M	142 M	12 M
200	0	6	1	123	141	11
500	0	11	-2	117	140	9
500	1000	29	-7	94	139	7
500	2000	49	-8	70	137	2
1000	4000	39	-9	39	95	- 40

a/ Lives which can be saved by striking first in scenarios in which the side striking first attempts to maximize the difference between its fatalities and those on the other side.
b/ U.S. first strike missiles attack weapons only. Soviet first strike maximizes difference between U.S. and Soviet fatalities.
c/ Difference between U.S. and Soviet fatalities in a scenario in which Soviets strike first to maximize this difference. Negative values indicate Soviet fatalities are greater than U.S. fatalities.

4. <u>Effect of Adding 192 ULMS Missiles to U.S. SLBM Force.</u>

a. <u>Retaliatory Capability</u>

ABM Level		U.S. Retaliates - Soviet Damage (%) a/		Soviets Retaliate - U.S. Damage (%) b/	
Area	Terminal	Deaths	Ind. Dam.	Deaths	Ind. Dam.
0	0	43	62	48	49
200	0	43	62	43	45
500	0	42	61	35	37
500	1000	40	60	12*/19	24
500	2000	36	57	7*/16	24
1000	4000	36	57	2*/4	13

a/ Neither U.S. nor Soviets use missile penetration aids.
b/ U.S. uses missile penetration aids, Soviets do not.

b. <u>War-fighting Results - U.S. Uses Missile Penetration Aids</u>

ABM Level (No. Interceptors)		Crisis Stability Deaths a/		Damage Limitation U.S. Deaths b/		Relative Deaths c/
Area	Terminal	U.S.	Soviet	U.S. 1st Strike	Soviet 1st Strike	
0	0	13 M	-5 M	122 M	143 M	7 M
200	0	17	-5	118	143	7
500	0	24	-7	110	144	7
500	1000	23	-8	85	143	6
500	2000	61	-9	63	137	0
1000	4000	51	-8	32	95	-41

a/ Lives which can be saved by striking first in scenarios in which the side striking first attempts to maximize the difference between its fatalities and those on the other side.
b/ U.S. first strike missiles attack weapons only. Soviet first strike maximizes difference between U.S. and Soviet fatalities.
c/ Difference between U.S. and Soviet fatalities in a scenario in which Soviets strike first to maximize this difference. Negative values indicate Soviet fatalities are greater than U.S. fatalities.

C. Option III

1. Summary of Option

Freeze on number of land-based and sea-based strategic offensive missile launchers, including ICBMs, SLBMs, SLCMs, and MR/IRBMs.
Ban on land mobile strategic offensive missile launchers.
Changes in external silo and/or launcher configuration or relocation of launchers is prohibited.
Conversion of IR/MRBMs to ICBMs prohibited.
The number of ABM launchers and interceptors will be agreed upon.
No limits on manned bombers and air defenses.

2. Force Summary (1978)

	U.S.	Soviet
Total Forces		
Intercontinental Bombers (UE)	345	50
ICBM Launchers		
Soft	0	136
Hard	1027	1164
SLBM Launchers	656	716
Fighter Interceptors	266	2300

3. Effectiveness

a. Retaliatory Capability

ABM Level		U.S. Retaliates - Damage to Soviet Union (%) a/				Soviets Retaliate - Damage to U.S. (%) b/	
Area	Terminal	Deaths		Industrial Damage		Deaths	Industrial Damage
		TF c/	MO d/	TF c/	MO d/		
0	0	40	38	59	53	43	42
200	0	40	37	59	52	36	37
500	0	39	36	58	50	25	24
500	1000	37	32	57	47	6*/12	19
500	2000	36	28	56	45	4*/10	19
1000	4000	32	10*/20	55	23	0*/4	5
1000	0	37		57			
5000	0	36		58			

a/ Neither U.S. nor Soviets use missile penetration aids.
b/ U.S. uses missile penetration aids; Soviets do not.
c/ Total force, including bombers.
d/ Missiles only.

b. War-fighting Results - U.S. Uses Missile Penetration Aids

ABM Level (No. Interceptors)		Crisis Stability Deaths a/		Damage Limitation U.S. Deaths b/		Relative Deaths c/
Area	Terminal	U.S.	Soviet	U.S. 1st Strike	Soviet 1st Strike	
0	0	18 M	0 M	111 M	142 M	12 M
200	0	24	- 3	105	141	10
500	0	31	- 5	95	140	8
500	1000	67	-11	58	142	6
500	2000	70	- 7	44	132	- 3
1000	4000	56	- 8	18	88	-47

a/ Lives which can be saved by striking first in scenarios in which the side striking first attempts to maximize the difference between its fatalities and those on the other side.

b/ U.S. first strike missiles attack weapons only. Soviet first strike maximizes difference between U.S. and Soviet fatalities.

c/ Difference between U.S. and Soviet fatalities in a scenario in which Soviets strike first to maximize this difference. Negative values indicate Soviet fatalities are greater than U.S. fatalities.

c. Military Targeting Results (Missiles Only) a/

US Strikes First

ABM Level		Damage to Soviets b/			Damage to US b/		
Area	Terminal	RVs Arv on Cities	RVs Arv on Mil Tgt	% Mil Tgt Dest	RVs Arv on Cities	RVs Arv on Mil Tgt	% Mil Tgt Dest
0	0	521	4139	24.3	201	834	35.7
200	0	553	4035	23.1	225	667	20.1
500	0	487	4020	22.2	242	411	17.4
500	1000	903	3024	15.2	310	166	7.6
500	2000	794	3183	16.5	527	(22% fatalities)	
1000	4000	967	2484	14.4	366	(10% fatalities)	

Soviets Strike First

ABM Level		Damage to Soviets b/			Damage to US b/		
Area	Terminal	RVs Arv On Cities	RVs Arv on Mil Tgt	% Mil Tgt Dest	RVs Arv on Cities	RVs Arv on Mil Tgt	% Mil Tgt Dest
0	0	601	2815	15.4	70	2726	73.7
200	0	622	2728	15.3	141	2515	70.6
500	0	610	2618	15.1	118	2327	66.8
500	1000	755	2054	13.3	439	1849	67.5
500	2000	715	2053	14.2	653	1440	41.7
1000	4000	983	2094	13.9	765	333	15.2

a/ In order to highlight the effects of changes in Ballistic Missile Defenses, calculations were made as to damage capability achievable through only ICBMs and SLBMs. Damage producing capabilities of the total strategic forces of each side would be higher than that shown. The amount of damage increase achievable by adding bombers would be dependent upon the size and effectiveness assumed for the respective bomber and air defense forces.

b/ Both the side striking first and the side striking second attempt to maximize military damage with missile weapons over and above those needed to inflict 25% fatalities. Unless otherwise noted, RVs arriving on cities achieve 25% fatalities.

4. Violations

a. Soviets Deploy ABM Launchers at the Rate Shown in the GTE a/ Threat.

	ABM Level		Damage to Soviet Union (%)					
			Total Force				Missiles Only	
			Without Pen Aids		With Pen Aids		Without Pen Aids	
Year	Area	Terminal	Deaths	Ind Dam	Deaths	Ind Dam	Deaths	Ind Dam
1974	125	0	40	59	40	59	38	53
1976	680	1000	34	54	35	55	29	44
1978	1125		30	50	31	50	19	27

a/ See DoD Strategic Force and Effectiveness Tables, March 3, 1969, for definition of GTE Threat and the rate of ABM deployment.

b. Soviets Deploy 500 SS-Z-10 Mobile ICBMs.

ABM Level		Damage to Soviet Union (%)			
Area	Terminal	Total Force a/		Missiles Only b/	
		Deaths	Ind. Dam.	Deaths	Ind. Dam.
0	0	40	59	38	53
200	0	40	59	37	52
500	0	38	58	36	50
500	1000	36	57	32	47

a/ Neither U.S. nor Soviets use missile penetration aids.
b/ U.S. uses missile penetration aids; Soviets do not.

c. Soviets Convert 700 IR/MRBMs to SS-Z-9 ICBMs.

ABM Level		Damage to Soviet Union (%)			
Area	Terminal	Total Force a/		Missiles Only b/	
		Deaths	Ind. Dam.	Deaths	Ind. Dam.
0	0	40	58	37	52
200	0	39	58	36	52
500	0	37	57	35	50
500	1000	35	56	31	44

a/ Neither U.S. nor Soviets use missile penetration aids.
b/ U.S. uses missile penetration aids; Soviets do not.

d. Upgrading of the Tallinn SA-5 System

The possible upgrading of the Tallinn SA-5 air defense system was considered under a range of assumptions:

(1) That the upgraded Tallinn would be deployed at the low NIPP rate with one interceptor per launcher. In 1978, 1800 launchers are projected.

(2) That the upgraded Tallinn would be deployed at the high NIPP rate with one interceptor per launcher yielding a total of 3000 launchers in 1978. This case also approximates that of a deployment at the low NIPP rate with two interceptors per launcher.

(3) That the upgraded Tallinn would be deployed at the high NIPP rate withone reload per launcher yielding a capability of 6000 interceptors in 1978.

It was assumed that each side was allowed 500 area interceptors. The U.S. retaliatory capabilities are as follows:

ABM Interceptors		Damage to Soviet Union (%) Deaths	Industrial Damage
2300	(No U.S. missile Pen-aids)	31	52
3500		21	40
6500		13*/14	35
2300	(With U.S. missile Pen-aids)	37	62
3500		33	58
6500		21	40

5. Excursions. To illustrate possible sensitivities to asymmetrical conditions, excursions were conducted using the military damage criteria calculated with the SMIPET computer model. In each excursion, calculations included damage capabilities using only missiles, and each side attempted to maximize military damage with missile weapons not needed to inflict 25 percent fatalities. Each excursion is summarized below, and detailed results are shown in TAB H.

a. Mix of Area and City ABM Defenses. The purpose of this excursion was to investigate the sensitivity of force capabilties to the ratio of area and terminal ABM defenses used by each side. The base case utilized was the 1,500 ABM level in which the mixture was 500 area and 1,000 terminal city defense interceptors for both sides. Three variations were investigated:

(1) The Soviets have 1,000 area/500 city interceptors and the the United States has 500 area/1,000 city interceptors.

(2) The Soviets have 500 area/1,000 city interceptors and the United States has 1,000 area/500 city interceptors.

(3) Both sides have 1,000 area/500 city interceptors.

The United States is able to achieve at least 25 percent fatalities in all cases. The Soviets are unable to achieve 25 percent fatalities in the retaliatory strike made against the U.S. 1000 area and 500 city ABM. U.S. capability against Soviet military targets is about the same in all cases in both the first strike and retaliatory modes. Soviet second strike capability against U.S. military targets is reduced to zero in all cases. When the Soviets strike first, their capability against U.S. military targets remains high.

b. Improved Soviet Technology. In this excursion, we improved the Soviet force in MIRVs, accuracy and yield beyond the basic CIA estimates for the Option III threat. Specifically, the SS-Z-3 was considered to have 10 RVs, each with a yield of 2.0 MT and a CEP of 0.16 NM; the SS-Z-9 was considered to have 3 RVs, each with a yield of 0.5 MT and a CEP of 0.16 NM; the SS-Z-10 was considered to have 3 RVs, each with a yield of 2.0 MT and a CEP of 0.25 NM; the SS-N-5 yield was increased. There is no reason to believe that these improvements could not be achieved if the Soviets were to decide to make improvements of this type. There was no counter improvement in the U.S. forces.

This excursion was tested only at the zero ABM level. At this level, the Soviet technological improvements in offensive forces had very little effect upon the capabilities of the U.S. to inflict military damage on the Soviets after achieving 25 percent fatalities, regardless of which side strikes first. In the base case of 1500 ABM interceptors the Soviets first strike capability against military targets was 75% destruction of the ICBM force and 55% of other military targets. The postulated increases in Soviet technology increased these figures to 99% and 98% respectively. In this case the U.S. would be dependent upon the alert bomber and SLBM capability for retaliatory capability.

c. ASW Improvements. This excursion was designed to illuminate the sensitivity of force capabilities to advances in antisubmarine warfare capability. The capabilities of both US and Soviet base case offensive forces were examined in three cases, each at an assumed ABM level of 500 area interceptors on each side:

(1) The United States loses 50 percent of its SLBM force.

(2) The Soviets lose 50 percent of their SLBM force.

(3) Both sides lose 50 percent of their SLBM force.

In all cases, regardless of which side strikes first, 25 percent fatalities are achieved. If the Soviets strike first, the U.S. second strike capability ranges from 10 to 18 percent against hard military targets and from 5 to 10 percent against soft military targets in all cases. Damage to U.S. military targets when the Soviets strike first ranges from 75 to 85 percent for hard targets and from 36 to 52 percent for soft targets.

d. Cheating. This excursion was designed to extend other cheating investigations in the report by including ABM cheating and by targeting the US forces without knowledge of the cheating. The purpose of the excursion is to show US force sensitivity to the postulated Soviet cheating instances separately and collectively. The latter case may be of most significance because it can be argued logically that if the Soviets cheat, they will cheat in as many areas as they believe they can do so covertly. Several cases were examined.

(1) The agreed ABM level is 500 area and 1,000 terminal interceptors. The Soviets covertly add 500 area interceptors. The total 1,000 Soviet area interceptors are deployed as 600 midcourse interceptors effective against ICBMs and 400 midcourse interceptors effective against SLBMs. The United States has 500 area interceptors. These results can be compared with the 1,500 ABM level (500 area/ 1,000 terminal) base case.

(2) The agreed ABM level is 500 area interceptors. The Soviets covertly add 500 mobile land-based ICBMs. These results can be compared with those of the 500 ABM level (all area interceptors) base case and with the assured destruction calculations shown on the 500 ABM line of paragraph 4b above.

(3) The agreed ABM level is 500 area interceptors. The Soviets covertly replace 700 IR/MRBM with ICBMs. These results can be compared with those of the 500 ABM level (all area interceptors) base case and the 500 ABM line of paragraph 4c.

(4) Combining cases 2 and 3.

(5) Same as 1 and, in addition, the Soviets covertly add the 500 mobile land-based ICBMs and covertly replace 700 IR/MRBM with ICBMs.

In case 1, the U.S. is able to achieve only five percent fatalities with missiles in the retaliatory mode. If the U.S. strikes first, Soviet fatalities are 25.8 percent and there is slight damage to the Soviet military targets. Regardless of who strikes first, the Soviets maintain their ability to achieve 25 percent fatalities. They have a significant capability to damage U.S. military targets when striking first, but in retaliation this capability is greatly reduced.

In cases 2, 3 and 4, both the US and Soviets maintain their ability to achieve 25 percent fatalities, regardless of which side strikes first. The US capability against the Soviet military targets remains essentially the same as in the base case except for a slight drop in damage to hard military targets when the Soviets add 500 ICBMs.

In case 5, the U.S. is unable to inflict 25 percent fatalities with its missiles when retaliating. When the U.S. strikes first, Soviet fatalities are 25 percent and there is a fair capability against Soviet military targets. Regardless of which side strikes first, the Soviets maintain good effectiveness against U.S. military targets.

e. Penetration Aid Failures

This excursion was designed to illuminate sensitivities which might exist if the U.S. were to experience a situation in which its missile penetration aids failed in an attack originally planned under an assumption that they would function properly. It was found that at an ABM level of 500 area interceptors and 1000 terminal city defense interceptors, unexpected failure of U.S. missile penetration aids had no significant effects upon the U.S. strategic missiles only effectiveness, regardless of which side struck first.

B. Option III - Superhardening Variant

1. Summary of Option

Same as Option III except superhardening and relocation of ICBM silos allowed.

2. Force Summary

All Minuteman III ICBMs relocated in superhard silos and 501 Soviet ICBMs, including all soft missiles, were relocated in superhard silos.

3. Effectiveness

a. Retaliatory Capability

ABM Level		U.S. Retaliates - Damage to Soviet Union (%) a/				Soviets Retaliate - Damage to U.S. (%) b/	
Area	Terminal	Total Force		Missiles Only		Total Force	
		Fat.	Ind. Dam.	Fat.	Ind. Dam.	Fat.	Ind. Dam.
0	0	44	63	43	59	57	63
500	0	42	62	41	58	54	62

a/ Neither U.S. nor Soviets use missile penetration aids.
b/ U.S. uses missile penetration aids; Soviets do not.

E. Option III - Freedom to Mix Sea/Land Forces

1. Summary of Option

Freedom to relocate ICBMs to SLBMs within the constraint of the total number of missiles.

2. Force Summary

192 and 384 Minuteman II ICBMs and the same number of Soviet ICBMs were assumed to be dismanteled and this number of additional SLBMs deployed.

3. Effectiveness

a. Retaliatory Capability

	192 Missiles Relocated	284 Missiles Relocated
Damage to Soviet Union		
Total Force		
Fatalities	42%	44%
Industrial Damage	60%	63%
Missiles Only		
Fatalities	40%	42%
Industrial Damage	57%	60%
Damage to U.S. (Total Force)		
Fatalities	39%	40%
Industrial Damage	33%	34%

4. Excursions in Mixing Sea/Land Offensive Forces

a. Cases Examined

Several asymmetrical sea/land offensive force mixes were examined through the military damage criteria. In each excursion calculations included damage capabilities using only missiles, and each side attempted to maximize military damage with missile weapons not needed to inflict 25 percent fatalities. The excursions were summarized below, and detailed results are shown at Tab H.

(1) Both Sides with Larger Sea-Based than Land-Based Offensive Forces. Each side had a larger proportion of its offensive forces at sea than at land. Also, the sea/land mix for each side was made to be about the same. This was accomplished by assuming the Soviets replaced 592 SS-Z-9 ICBMs with SS-NZ-1 SLBMs, and the U.S. replaced 384 MM II ICBMs with ULMS SLBMs.

(2) Soviets Larger Sea-Based than Land-Based and U.S. Larger Land-Based. Soviets as in Case (1), but U.S. replaced 192 Poseidon missiles (12 SSBNs) with MM III ICBMs.

(3) U.S. Has Larger Sea-Based than Land and Soviet Larger Land-Based. Soviets had their base case forces, but the U.S. replaced 592 ICBMs with ULMS SLBMs.

(4) Both Sides About Equally Divided Land/Sea Forces. Each side replaced 192 ICBMs with SLBMs.

b. Effectiveness

Regardless of which side strikes first, in all cases 25 percent fatalities are achieved. If the Soviets strike first, U.S. retaliatory damage on Soviet hard military targets ranged from about 19 percent (296 targets damaged out of total of 1,566) in the base case to about 40 percent (386 targets damaged out of total of 974) in the case where both sides have large sea forces and small land forces. Against other military targets, the U.S. retaliatory damage on Soviet other military targets is about 8-10 percent (63 to 78 targets damaged out of total 808) in all cases except large Soviet land force versus large U.S. sea force, in which case it is about 78 percent (631 targets damaged out of total 808).

5. Excursions in Mixing Sea/Land BMD Forces

a. Agreed Level of 1500 ABM Interceptors

These cases were based upon a fixed level of 1000 land/based terminal city ABM and 500 area interceptors. Cases examined were:

(1) The 500 Soviet Area ABM were all midcourse interceptors effective against land-based ICBMs and the U.S. Area ABM were deployed nationwide.

(2) The 500 U.S. Area ABM consisted of 300 midcourse interceptors effective against land-based ICBMs and 200 midcourse interceptors effective against SLBMs. The Soviet Area ABM were deployed nationwide.

(3) The 500 Soviet Area ABM consisted of 300 midcourse interceptors effective against land-based ICBMs and 200 midcourse interceptors effective against SLBMs. The U.S. Area ABM were deployed nationwide.

Each case was tested by the military damage criteria calculated with the SMIPET computer model, using missiles only and requiring 25 percent fatalities. Regardless of which side strikes first, the 25 percent fatality objective was achieved. In the case of the Soviets striking first, the U.S. capability is insensitive to ABM mix except when the Soviets deploy midcourse interceptors against both ICBMs and SLBMs. In this case, the U.S. has only enough weapons to achieve the 25 percent fatalities, but has none left for use on military targets.

b. Agreed Level of 1000 ABM Interceptors

These cases were based upon a fixed level of 1000 ABM interceptors. Cases examined were:

(1) The base case in which each side has 1000 area interceptors effective against all offensive missile weapons.

(2) The 1000 Soviet interceptors are used as terminal city defenders. The 1000 U.S. ABM consisted of 600 midcourse interceptors effective against ICBMs and 400 midcourse interceptors effective against SLBMs.

(3) The 1000 Soviet ABM consisted of 600 midcourse interceptors effective against ICBMs and 400 midcourse interceptors effective against SLBMs. The 1000 U.S. interceptors are used as terminal city defenders.

Effectiveness

In case (3), the U.S. is unable to achieve 25 percent fatalities in retaliation. In all other cases, both sides are able to achieve 25 percent fatalities regardless of which side strikes first. In all Soviet first strike cases, they are able to inflict significant military damage to the U.S. When the U.S. deploys the midcourse interceptors the damage to hard targets is reduced from 80 percent in the base case to about 72 percent and the other military damage is reduced from 40 percent in the base case to about five percent. If the U.S. strikes first the Soviets are unable to damage U.S. military targets in retaliation except when they deploy midcourse interceptors. In this case they achieve about 55 percent damage to the U.S. hard military targets and do not damage U.S. other military targets.

F. Option IV

1. Summary of Option

Same as Option III except that the deployment and flight testing of MIRVs, MOBS and FOBS are prohibited.

2. Force Summary (1978)

	U.S.	Soviet
Total Forces		
Intercontinental Bombers (UE)	345	50
ICBM Launchers		
Soft	0	136
Hard	1027	1164
SLBM Launchers	656	716
Fighter Interceptors	266	2300

3. Effectiveness

a. Retaliatory Capability

ABM Level		U.S. Retaliates - Soviet Damage (%) a/				Soviets Retaliate - U.S. Damage (%) b/	
Area	Terminal	Fatalities		Ind. Dam.		Fatalities	Ind. Dam.
		TF c/	MO d/	TF	MO		
0	0	38	37	64	63	54	57
200	0	33	31	61	60	49	52
500	0	29	26	59	56	40	40
500	1000	25	7*/17	56	39	12*/20	28

a/ Neither the U.S. nor Soviets used missile penetration aids.
b/ U.S. uses missile penetration aids; the Soviets do not.
c/ Total Force, including bombers.
d/ Missiles only.

b. War-fighting Results - U.S. Uses Missile Penetration Aids

ABM Level (No. Interceptors)		Crisis Stability Deaths a/		Damage Limitation U.S. Deaths b/		Relative Deaths c/
Area	Terminal	U.S.	Soviet	U.S. 1st Strike	Soviet 1st Strike	
0	0	5 M	- 6 M	130 M	141 M	17 M
200	0	12	- 9	122	140	15
500	0	19	- 8	107	135	11
500	1000	29	-12	63	101	-22

a/ Lives which can be saved by striking first in scenarios in which the side striking first attempts to maximize the difference between its fatalities and those on the other side.
b/ U.S. first strike missiles attack weapons only. Soviet first strike maximizes difference between U.S. and Soviet fatalities.
c/ Difference between U.S. and Soviet fatalities in a scenario in which Soviets strike first to maximize this difference. Negative values indicate Soviet fatalities are greater than U.S. fatalities.

c. Comparisons with Option III Results

(1) For each level of ABM interceptors examined, the Soviet retaliatory capability is larger with Option IV than with Option III, but the corresponding U.S. retaliatory capabilities are smaller with Option IV than with Option III.

(2) For levels of ABM of 500 area interceptors and below, the Soviet retaliatory capability with Option IV is significantly larger than

the U.S. retaliatory capability with Option IV. However, with 1000 city terminal interceptors added to 500 area interceptors, the U.S. retaliatory capability becomes significantly larger than that of the Soviets.

(3) The number of lives which the United States could save by striking first in a crisis is larger at all ABM levels with Option III than with Option IV. Although the Soviets would actually lose lives by strking first with either Option III or IV, these losses would be smaller with Option III than with Option IV, particularly at lower levels of ABM.

(4) U.S. damage limiting capabilities computed in a scenario with the United States making an all counterforce first strike are better with Option III than with Option IV.

(5) U.S. damage limiting capabilities computed in a scenario with the Soviets striking first to maximize fatality differences are about the same with Options III and IV if ABM levels are low, but for higher levels this measure of effectiveness is better with Option IV than with Option III.

4. Violations

a. Soviets Deploy ABMs at Rate Shown in GTE Threat Beginning in 1973.

Year	ABM Level		U.S. Retaliates - Damage to Soviet Union	
	Area	Terminal	Fatalities	Industrial Damage
1974	125	0	34	62
1976	680	1000	8*/14	38
1978	1125	3000	10*/14	37

In order to test our ability to respond to this violation we assumed that the U.S. would begin to deploy MIRVs at a rate 50% greater than is currently programmed. We examined two cases: (1) R&D on the Minuteman III and Poseidon was not completed; and (2) MIRV R&D programs had been completed and the systems were ready for deployment. The U.S. retaliatory capabilities under these two assumptions are shown in the following table.

Year	ABM Level		U.S. Retaliates - Soviet Damage (%)	
	Area	Terminal	Deaths	Industrial Damage
		MIRV R&D not completed		
1976	680	1000	24	51
1978	1125	3000	29	54
		MIRV R&D completed		
1976	680	1000	28	53
1978	1125	3000	29	54

We also examined the case in which the Soviets deploy an additional 300 area interceptors at an agreed level of 200 interceptors. The resulting damage to the Soviet Union was:

Deaths	25%
Industrial Capacity	54%

b. Soviets Deploy 500 SS-Z-10 Mobile ICBMs.

ABM Level		U.S. Retaliates - Damage to Soviet Union (%)	
Area	Terminal	Deaths	Industrial Damage
0	0	38	64
200	0	34	63
500	0	27	56
500	1000	23	53

c. Soviets Convert 700 IR/MRBMs to SS-Z-9 ICBMs.

ABM Level		U.S. Retaliates - Damage to Soviet Union (%)	
Area	Terminal	Deaths	Industrial Damage
0	0	34	60
200	0	29	55
500	0	22	47
500	1000	9*/18	40

d. Soviets Deploy MIRVs on 221 SS-9 ICBMs (Three 3.5 MT Warheads) (No ABM).

Damage to the Soviet Union

Deaths	36%
Industrial Capacity	61%

e. Upgrading the Tallinn SA-5 System

The possible upgrading of the Tallinn SA-5 air defense system was considered under a range of assumptions:

(1) That the upgraded Tallinn would be deployed at the low NIPP rate with one interceptor per launcher. In 1978, 1800 launchers are projected.

(2) That the upgraded Tallinn would be deployed at the high NIPP rate with one interceptor per launcher yielding a total of 3000 launchers in 1978. This case also approximates that of a deployment at the low NIPP rate with two interceptors per launcher.

(3) That the upgraded Tallinn would be deployed at the high NIPP rate with one reload per launcher yielding a capability of 6000 interceptors in 1978.

It was assumed that each side was allowed 500 area interceptors. The U.S. retaliatory capabilities are as follows:

ABM Interceptors (Area)	U.S. Retaliates - Damage to Soviet Union (%) Deaths	Industrial Damage	
2300	13*/14	36	No U.S. Missile Pen-aids
3500	13*/14	36	
6500	13*/14	36	
2300	33	62	With U.S. Missile Pen-aids
3500	28	58	
6500	17	38	

f. Excursions in Undetected Cheating.

The capabilities of the U.S. missile forces of Option IV (MIRVs banned) in the face of undetected cheating were examined for three levels of ABM (0, 200, and 500 area interceptors) and three types of ABM cheating (addition of new midcourse interceptors effective against SLBMs, conversion of 50% of their land-based ICBMs to have a dual capability for offense and area BMD, and conversion of 50% of their land-based ICBMs to have a dual capability for offense and terminal city defense). Each case was tested in terms of the capabilities of the U.S. missiles to inflict both fatalities and military damage in a second strike, after undergoing a combined city/military first strike by Soviet missiles. A scenario was used in which both the initiator and retaliator attempted to achieve 25% fatalities and then maximize military damage with missiles not required for attacking cities.

When there was no Soviet cheating, U.S. missiles were able to achieve 25% Soviet fatalities and destroy about 10% of the available military targets. For the low agreed levels of ABM tested the no-cheating results were relatively insensitive to the actual level of ABM because the projected U.S. missile force included about 13,000 area ABM decoys. For all three agreed levels, when the U.S. targeted assuming no cheating but encountered the covert addition of 200 midcourse interceptors effective against SLBMs Soviet fatalities were reduced to 17 or 18%, and military damage was lowered slightly. At an agreed level of 500 ABM, covert addition of 100 midcourse interceptors did not lower the fatalities below 21%, but adding 400 brought them down to 8%. The latter result was not changed significantly when the Soviets covertly added both the 400 midcourse interceptors and 400 land-mobile ICBMs.

Covert conversions by the Soviets of half of their land-based ICBMs to have a dual capability as area ABM interceptors did not have much impact on the U.S. missile penetration, and the U.S. second strike capabilities remained virtually unchanged. However, when the U.S. targeted assuming no cheating but encountered the covert conversion of half the land-based Soviet ICBMs to dual capable terminal city defenders there was a significant difference in U.S. capabilities. For each agreed ABM level examined the Soviet fatalities were reduced to 17 or 18% again, and military damages were increased by small amounts.

In view of the strong influence of U.S. missile penetration aids on the above calculations, excursions were conducted to examine situations in which the U.S. did not use its penetration aids. Under these circumstances, with no Soviet cheating U.S. missiles were still able to achieve the 25% fatalities against an agreed level of 500 area ABMs, but the damage to military targets became almost negligible. When the Soviets covertly added 100 midcourse interceptors to this no penetration aids, 500 ABM case Soviet fatalities decreased from 25% to about 21%.

Detailed results are shown in Figures 11-A and 12-A of Tab H.

5. Excursions in Mixing Sea/Land BMD Forces.

These excursions were conducted to examine only the 1000 ABM interceptor level. Cases examined were:

a. Both sides deployed their interceptors as nationwide area interceptors.

b. The Soviets deployed their interceptors to provide terminal defense of cities, and the U.S. deployed theirs as 600 midcourse interceptors effective against land-based ICBMs and 400 midcourse interceptors effective against SLBMs.

c. The Soviets deployed their interceptors as 600 midcourse interceptors effective against land-based ICBMs and 400 midcourse interceptors effective against SLBMs, and the U.S. deployed theirs to terminally defend cities.

Each case was tested by the military damage criteria calculated with the SMIPET computer model, using missiles only and requiring 25 percent fatalities. U.S. retaliatory capabilities under the symmetrical conditions of case (a) were not much different from what they were with zero ABMs and were not appreciably affected when the Soviets used terminal city defenders in case (b). However, when the Soviets switched to midcourse interceptors the U.S. missiles could achieve only 20 percent fatalities in retaliation. On the other hand, the Soviet second strike capability was only about 13 percent fatalities in the symmetrical case, 25 percent fatalities plus destruction of only a few hard military targets when the U.S. used midcourse interceptors, and 25 percent fatalities plus about 300 hard military targets when the U.S. terminally defended cities.

G. Additional Analysis

In addition to the above calculations, the following excursions were analyzed to test their possible impact on a possible agreement. The analyses were conducted for the force postures under Option III for 1978.

1. Hard Point Defense (HPD)

The effects of defending the ICBM silos with terminal ABMs was investigated.

a. Retaliatory Capability

ABM Level			U.S. Retaliates - Soviet Damage (%) a/		Soviets Retaliate - U.S. Damage (%) b/	
Area	Terminal	HPD	Deaths	Ind. Dam.	Deaths	Ind. Dam.
0	0	640	43	61	43	60
200	0	1280	43	63	44	65
500	0	1920	43	63	38	61
500 c/	0	640 c/	41	60		

a/ Neither the U.S. nor Soviets used missile penetration aids.
b/ U.S. used missile penetration aids; the Soviets did not.

b. War-fighting Results - U.S. Uses Missile Penetration Aids

ABM Level		Crisis Stability Deaths a/		Damage Limitation U.S. Deaths b/		Relative Deaths c/
Area	HPD	U.S.	Soviet	U.S. 1st Strike	Soviet 1st Strike	
0	500	15 M	-3 M	113 M	142 M	9 M
200	800	21	-8	108	143	8
500	2000	27	-7	103	144	8

a/ Lives which can be saved by striking first in scenarios in which the side striking first attempts to maximize the difference between its fatalities and those on the other side.
b/ U.S. first strike missiles attack weapons only. Soviet first strike maximizes difference between U.S. and Soviet fatalities.
c/ Difference between U.S. and Soviet fatalities in a scenario in which Soviets strike first to maximize this difference. Negative values indicate Soviet fatalities are greater than U.S. fatalities.

2. Variation in the Mix of Area and Terminal ABM Interceptors

The effects of various mixes of area and terminal ABM interceptors in the U.S. and Soviet retaliatory capabilities was investigated at the level of 2500 interceptors. The results are shown in the following table:

U.S. Second Strike Capability

U.S. ABM Level		Soviet ABM Level		Total Force Soviet Fatalities (%) a/		Missiles Only Soviet Fatalities (%)
Area	Terminal	Area	Terminal	w/o U.S. Missile Pen-Aids	with U.S. Missile Pen-Aids	Without U.S. Missile Pen-Aids
500		2500	0	26	30	18
500		2000	500	26	30	20
500		1500	1000	30	32	22
500		1000	1500	33	34	24
500		500	2000	36	36	28
500		0	2500	39	39	10*/30
				U.S. Fatalities (%) b/		
2500	0	500		0*/4	28	
2000	500	500		0*/4	13*/19	
1500	1000	500		0*/4	10*/18	
1000	1500	500		0*/4	10*/19	
500	2000	500		4*/10	9*/20	
0	2500	500		11*/20	13*/20	

a/ There were no Soviet missile penetration aids.
b/ U.S. used missile penetration aids; Soviets did not.

TABLE IV-1

NUMBER OF MISSILE RVs DETONATING ON SECOND STRIKE

ABM Level		OPTION I		OPTION III		OPTION IV	
Area	Terminal	US RV's	SU RV's	US RV's	SU RV's	US RV's	SU RV's
0	0	2401	1072	2378	606	512	818
200	0	2272	905	2247	462	400	647
500	0	2095	658	2068	216	308	399
500	1000	1720	228	1694	116	243	151
500	2000	1516	208	1487	117		
1000	4000	1108	110	1076	0		
	Terminal HPD			HARDPOINT DEFENSE			
0	640			2505	676		
200	1280			2550	542		
500	1920			2522	316		
				SUPERHARDENING			
0				2726	1758		
500				2489	1346		
				FREEDOM TO MIX			
500 (192 missiles moved to sea)				2914	168		
500 (384 missiles moved to sea)				3864	193		

Results obtained from retaliatory capability calculations.

TABLE IV-2

EMT DETONATING ON SECOND STRIKE a/
(Using Total Forces vs Cities)

ABM Level		OPTION I		OPTION III		OPTION IV	
Area	Terminal	US EMT	SU EMT	US EMT	SU EMT	US EMT	SU EMT
0	0	500	903	489	515	695	1022
200	0	513	764	481	398	567	819
500	0	487	560	472	186	471	511
500	1000	443	213	429	109	403	239
500	2000	419	185	404	99		
1000	4000	392	96	379	0		
	Terminal HPD						
0	640			578	591		
200	1280			620	481		
500	1920			633	281		
				SUPERHARDENING			
0				619	1794		
500				607	1376		
				Freedom to MIX			
500 (192 Missiles moved to sea)				567	121		
500 (384 Missiles moved to sea)				649	125		

a/ From retaliatory capability calculations in which the side striking first uses all missiles in a counterforce role and the side striking second uses all surviving forces, including bombers, against urban/industrial complexes.

TABLE IV-3

EMT DETONATING ON SECOND STRIKE
(Missiles Only, 25% Fatalities Plus Military Targets) a/

ABM Level		OPTION III				OPTION IV			
		US EMT		SU EMT		US EMT		SU EMT	
Area	Terminal	Fats b/	Mil	Fats b/	Mil	Fats b/	Mil	Fats b/	Mil
0	0	113	444	140	745	171	471	192	936
200	0	115	449	153	616				
500	0	125	447	156	409				
500	1000	248	246	336	182				
500	2000	282	304	553	(22%)				
1000	4000	238	597	326	(10%)				
1000	0	130	347	165	(23%)	180	797	60	(15%
FREEDOM TO MIX OFFENSIVE FORCES									
500	0 c/	99	593	160	337				
500	0 d/	179	378	150	431				
500	0 e/	97	702	167	241				
500	0 f/	112	460	159	357				
FREEDOM TO MIX DEFENSIVE FORCES									
g/		166	432	183	0	328	585	199	93
h/		122	(21%)	384	854	212	(20%)	390	380

a/ From Military Targeting Results. Both initiator and retaliator set aside missiles to achieve 25% fatalities and use all remaining missiles on military targets

b/ Unless otherwise indicated EMT in "Fats" column achieved 25% fatalities

c/ Both sides large sea force

d/ Soviets large sea force, US large land force

e/ Soviets large land force, US large sea force

f/ Both sides about equally divided land/sea

g/ Soviets 1000 terminal, US 1000 midcourse interceptors

h/ Soviets 1000 midcourse interceptors, US 1000 terminal

A P P E N D I X

TAB A

POSSIBLE ALTERNATIVE OPTIONS FOR STRATEGIC ARMS CONTROL

POSSIBLE ALTERNATIVE OPTIONS FOR STRATEGIC ARMS CONTROL

BASIC OPTION I. FREEZE OF NUMBERS OF LAND-BASED OFFENSIVE MISSILE LAUNCHERS

In this option, the U.S. would propose a "freeze" of the number of fixed land-based strategic offensive missile launchers, with no constraints on sea-based missiles. Mobile land-based strategic offensive missiles would be completely banned. There would be no restrictions on MIRVs, on any other improvements of ICBMs, or on ABM characteristics.

In this and other options, "land-based strategic offensive missiles" would be defined to include all land-based missiles with a range capability in excess of 1000 kilometers. (This definition is intended to exclude U.S. Pershing missiles and Soviet "Scaleboard" SS-12 tactical missiles.)

For each of the basic options, a range of ABM levels will be considered; this range is described after the description of the four basic options.

A. Fixed Land-Based ICBM Launchers

This option would require cessation of the initiation of construction of any additional strategic offensive fixed land-based missile launchers as of July 1, 1969, except to replace launchers on a one-for-one basis. The Soviet Union would be permitted to complete the launchers which it is constructing as of that date. Under no circumstances would either side be permitted to deploy more than 1300 fixed ICBM launchers, excluding launchers for R, D, T, & E and training. No restrictions would be imposed on one-for-one replacement or relocation of ICBM launchers with new or improved types. No restrictions would be imposed upon technological improvements of launchers or missiles already deployed, including increasing the hardness of existing silos and deployment of MIRVs, MRVs, or the retrofitting of existing launchers with new missiles. The prohibition on additional construction applies to the deployment of new launchers for partial or multiple orbit strategic missile systems, although deployment of such weapons in launchers would be permitted within the allowed total number of ICBM launchers.

B. Fixed Land-Based IRBM/MRBM Launchers

Further construction of fixed land-based launchers for IRBM/MRBMs (ranges greater than 1000 km) would be prohibited. The retrofitting of existing IRBM/MRBM launchers to accommodate ICBM missiles would be prohibited. The installation of ICBM missiles on IRBM/MRBM launchers would be prohibited, as would the conversion of IRBM/MRBM missiles to ICBM missiles. Building of additional IRBM/MRBM silos, enlarging of existing silos, changing basic external configuration of silos and the relocation of launchers would be prohibited. No additional restrictions would be imposed upon technological improvements of launchers or missiles already deployed or the retrofitting of existing launchers with new missiles of intermeditate or medium range.

C. Mobile Land-Based Offensive Missile Systems

This option would impose a complete ban on deployment, testing and production of mobile land-based strategic offensive missile systems (ranges greater than 1000 km). Missile systems with such ranges carried by water-borne vehicles on inland waterways would also be prohibited. Any such existing systems would be destroyed. Flight testing of strategic offensive missiles in a mobile system configuration would be prohibited.

D. Sea-Based Offensive Missile Systems

No restrictions would be imposed on strategic offensive missile-launching submarines or ships or on additional or improved sea-based launchers.

E. ABMs

This option would ban the deployment of more than a set and equivalent number of antiballistic missile launchers and associated antiballistic missiles, including reload missiles [and associated radars]. There would be no constraint on the characteristics of the ABM system deployed. (See "Alternative ABM Variants" below.)

F. Aircraft and Antiaircraft Systems

This option would not include limitations on aircraft or antiaircraft systems.

G. R, D, T, & E Launchers

Land-based missile launchers for research, development, testing, evaluation, and training would be permitted, but their total number on each side could not exceed an agreed [number or] percentage of that side's permitted number of operational land-based missile launchers.

H. Technological Improvements

There would be no prohibition of technological improvements.

BASIC OPTION II. FREEZE OF NUMBERS OF OFFENSIVE MISSILE LAUNCHERS

In this option, the U.S. would propose a "freeze" of the numbers of land-based and sea-based strategic offensive missile launchers, respectively. There would be no restrictions on MIRVs, on any other improvements of ICBMs, or on ABM characteristics. Mobile ICBMs would be permitted within the total allowed number of ICBMs.

In Basic Option II, the provisions in Sections A, B, E, F, and H of Option I would apply, and the following provisions would be added:

Mobile Land-Based Offensive Missile Systems

Mobile ICBMs would be permitted within the allowed combined total of fixed and mobile ICBM launchers (either 1300 or the number under construction on July 1, 1969, whichever is less). Mobile IRBMs/MRBMs would be prohibited.

Sea-Based Offensive Missile Systems

This option would limit the numbers of SLBM launchers and SLCM launchers, respectively, to the number of each type which are operational or under construction as of July 1, 1969, subject to agreement on the numbers under construction. There would be no other restrictions on the replacement of SLBMs or SLCMs or their launchers by improved versions, but SLCMs could not be replaced by SLBMs. SLBM launchers could be replaced by surface-ship missile launchers on a one-for-one basis.

R, D, T, & E Launchers

Land-based or sea-based missile launchers for research, development, testing, evaluation, and training would be permitted, but their total number of each side could not exceed an agreed /number or/ percentage of that side's permitted number of operational missile launchers.

VARIANT II-A. FREEZE OF SUM OF ICBM AND SLBM LAUNCHERS

This option is identical to Basic Option II except that the total number of ICBM and SLBM launchers existing or under construction as of July 1, 1969, would be frozen. Within that overall ceiling, each side would be permitted to vary the mix of land-based and sea-based offensive ballistic missile launchers as desired.

BASIC OPTION III. FREEZE OF NUMBERS AND CERTAIN TYPES OF OFFENSIVE MISSILE LAUNCHERS WITH MIRVs ALLOWED

In this option, the U.S. would propose a "freeze" of the numbers of land-based and sea-based strategic offensive missile launchers, respectively, as well as certain limited qualitative restrictions, and a ban on mobile land-based missiles. MIRV testing and deployment would be allowed.

A. Fixed Land-Based ICBM Launchers

This option would require cessation of the initiation of construction of any additional strategic offensive land-based missile launchers as of July 1, 1969. The Soviet Union would be permitted to complete the launchers which it is constructing as of that date. Beyond that date, however, it would not be allowed to initiate further construction of fixed ICBM launchers. Under no circumstances would either side be permitted to deploy more than 1300 ICBM launchers, excluding launchers for R, D, T, & E and training. Building of additional silos, enlarging of existing silos, changing basic external configuration of silos and other launchers, and the relocation of launchers would be prohibited. No additional restrictions would be imposed upon technological improvements of launchers or missiles already deployed, including increasing the hardness of existing silos and deployment of MIRVs/MRVs, or the retrofitting of existing launchers with new missiles. The prohibition on additional construction applies to the deployment of new launchers for partial or multiple orbit strategic missile systems, although deployment of such weapons in launchers would be permitted within the allowed total number of ICBM launchers.

B. Fixed Land-Based IRBM/MRBM Launchers

Further construction of fixed land-based launchers for IRBM/MRBMs (ranges greater than 1000 km) would be prohibited. The retrofitting of existing IRBM/MRBM launchers to accommodate ICBM missiles would be prohibited. The installation of ICBM missiles on IRBM/MRBM launchers would be prohibited, as would the conversion of IRBM/MRBM missiles to ICBM missiles. Building of additional silos, enlarging of existing silos, changing basic external configuration of silos and other launchers, and the relocation of launchers would be prohibited. No additional restrictions would be imposed upon technological improvements of launchers or missiles already deployed or the retrofitting of existing launchers with new missiles of intermediate or medium range.

C. Mobile Land-Based Offensive Missile Systems

This option would impose a complete ban on deployment, testing and production of mobile land-based strategic offensive missile systems (ranges greater than 1000 km). Missile systems with such ranges carried by waterborne vehicles on inland waterways would also be prohibited. Any such existing systems would be destroyed. Flight testing of strategic offensive missiles in a mobile system configuration would be prohibited.

D. Sea-Based Offensive Missile Systems

1. This option would ban the construction of additional strategic offensive missile launching submarines or of additional launchers in existing submarines. This prohibition would apply to all submarines with ballistic missile or cruise missile launchers. Such submarines under construction as of July 1, 1969, could be completed, subject to agreement on their number. There would be no limitations on the characteristics of SLBMs or SLCMs, or on retrofitting existing missile submarines with new or larger missiles of the type with which they are equipped, i.e., ballistic or cruise-type missiles. The fitting-out of surface ships with facilities for firing offensive strategic ballistic missiles would be prohibited.

2. There would be no replacement of operational ballistic or cruise missile submarines within the first five years of the agreement. During that period, the two sides would undertake to reach agreement on rules governing subsequent replacement of submarines. In the absence of a supplementary agreement on such rules, each side may replace submarines after five years from the date of the initiation of the agreement provided that replacement does not increase the total number of submarines or of launcher tubes for submarine-launched ballistic missiles or cruise missiles.

E. ABMs

This option would ban the deployment of more than a set and equivalent number of fixed, land-based antiballistic-missile launchers, associated antiballistic missiles, including reload missiles, /and associated radars/. A total prohibition on deployment of mobile ABM systems, both land-based and sea-based, would be imposed. There would be no other constraints on the characteristics of the ABM systems deployed. (See "Alternative ABM Variants" below.)

F. Aircraft and Antiaircraft Systems

This option would not include limitations on aircraft or antiaircraft systems.

G. R, D, T, & E Launchers

Land-based or sea-based missile launchers for research, development, testing, evaluation, and training would be permitted, but their total number on each side could not exceed an agreed /number or/ percentage of that side's number of operational missile launchers.

H. Technological Improvements

There would be no prohibition of technological improvements other than those specified.

VARIANT III-A. SUPERHARDENING

Hard-rock superhardening and relocation of ICBM silos would be permitted.

VARIANT III-B. FREEZE OF SUM OF ICBM AND SLBM LAUNCHERS

This option is identical to Basic Option III except that the total number of ICBM and SLBM launchers existing or under construction as of July 1, 1969, would be frozen. Within that overall ceiling, each side would be permitted to vary the mix of land-based and sea-based offensive ballistic missile launchers as desired.

BASIC OPTION IV. FREEZE OF NUMBERS AND CERTAIN TYPES OF OFFENSIVE MISSILE LAUNCHERS WITH MIRVs PROHIBITED

This option is identical to Basic Option III, except that the U.S. would also propose that multiple independently targetted reentry vehicles (MIRVs) and certain types of flight tests be prohibited.

In addition to all the restrictions listed in Option III, the deployment of MIRVs would be totally prohibiting as would further flight-testing of MIRVs (including any post-boost maneuvering and the testing of any multiple reentry vehicles), maneuvering reentry vehicles (MIRVs), fractional and multiple orbital weapon systems (FOBS and MOBS), and depressed-trajectory ICBMs. There would be no restriction on the improvement of flight-testing of other offensive missile system characteristics.

U.S. ability to verify an agreement based on this option should be evaluated both with and without a provision in the agreement that all strategic missile and space firings, both military and non-military, would be pre-announced and conducted on agreed ranges.

ALTERNATIVE ABM VARIANTS TO FOREGOING OPTIONS

Along with each of these four basic options for offensive missiles, consideration should be given to alternative variants with respect to ABM levels, as follows.

ABM Level 1

All ABM launchers /and associated radars/ would be prohibited, and any such existing systems would be destroyed, except that an agreed limited number of R, D, T, & E launchers and radars would be permitted.

ABM Level 2

Each side could deploy up to 100 ABM launchers and 100 associated missiles (including reload missiles) /along with associated radars/.

ABM Level 3

Each side could deploy some agreed level of missile defense up to a maximum of 1000 area ABM launchers and up to a maximum of 1500 terminal ABM launchers and associated missiles (including reload missiles) /along with associated radars/.

ADDITIONAL ABM VARIANT

For the various cases studied under ABM Level 3, each side would be permitted to vary the mix it deploys of land-based and sea-based ABM launchers, with associated missiles and radars. This is implicit in Options I and II, and would also be examined as an additional excursion to Variant III-B.

In performing analyses, some assumptions must be made regarding types of ABM interceptors and their locations. It is suggested that the calculations be carried out for the various levels as follows: (This is only a suggestion for consideration by the Working Group and Systems Analysis).

1. No ABM

2a. U.S.S.R. - 100 area ABM launchers, with associated missiles and radars, optimally deployed for population defense.

U.S. - Same

2b. U.S.S.R. - Same as 2a, except that the deployments include the present "Moscow system." Additional deployments, up to agreed limits, are of the same types already deployed and are for the purpose of completing the existing system.

U.S. - Same as 2a, except that the facilities are located in North Dakota and Montana and are for the purpose of providing protection for Minuteman sites. (This is essentially the Phase I deployment of the Safeguard System.)

3a, 3b, 3c,.. Various levels and mixes of urban and hard-point defenses will be analyzed in the ranges 100-1000 area ABM launchers and 100-1500 terminal ABM launchers, with associated missiles and radars.

TAB B

U.S. FORCES

U.S. Forces

This Tab presents the baseline U.S. forces and weapons characteristics for the various options. The forces and characteristics are as close to the currently approved program as the option constraints allow. In particular, the Minuteman III, FB-III, and SRAM program were adjusted to conform to recent revisions to the FY 70 budget.

Since the options do not place any constraints on bomber forces or air defenses, the programmed bomber and air defense forces are used throughout for comparability. No ABM deployments were specified in the force tables, since these were varied in the analysis.

U.S. Baseline Forces

Option I

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Intercontinental Bombers (UE)									
B-52	345	285	285	285	285	285	285	285	285
B-58	75	75	75	75					
FB-111	30	60	60	60	60	60	60	60	60
Land Based ICBM Launchers									
On Line:									
Titan	54	54	54	54	45	45	36	36	27
Minuteman I	450	350	207	47					
Minuteman II	494	494	494	487	480	473	466	459	452
Minuteman III (2 RV)	5	55	120	204	257	261	264	268	271
Minuteman III (3 RV)	5	55	120	203	257	260	264	267	271
In Modernization/494L	46	46	59	59	6	6	6	6	6
Subtotal	1054	1054	1054	1054	1045	1045	1036	1036	1027
Sea Based Missile Launchers *									
On Line:									
Polaris (A-2)	128	128	128	16	0	0	0	0	0
Polaris(A-3)	368	192	144	176	160	128	96	128	160
Poseidon		64	176	320	352	368	368	368	352
In Conversion/Overhaul	160	272	208	144	144	160	192	160	144
Subtotal	656	656	656	656	656	656	656	656	656
Total ICBM and SLBM Launchers	1710	1710	1710	1710	1701	1701	1692	1692	1683

ABM Levels will be varied in excursions to the Baseline Forces.

* SLBM levels will be varied in excursions to the Baseline Forces.

U.S. Baseline Forces

Option II

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Intercontinental Bombers (UE)									
B-52	345	285	285	285	285	285	285	285	285
B-58	75	75	75	75					
FB-111	30	60	60	60	60	60	60	60	60
Land Based ICBM Launchers									
On Line:									
Titan	54	54	54	54	45	45	36	36	27
Minuteman I	450	350	207	47					
Minuteman II	494	494	494	487	480	473	466	459	452
Minuteman III (2 RV)	5	55	120	204	257	261	264	268	271
Minuteman III (3 RV)	5	55	120	203	257	260	264	267	271
In Modernization/494L	46	46	59	59	6	6	6	6	6
Subtotal	1054	1054	1054	1054	1045	1045	1036	1036	1027
Sea Based Missile Launchers									
On Line:									
Polaris (A-2)	128	128	128	16	0	0	0	0	0
Polaris (A-3)	368	192	144	176	160	128	96	128	160
Poseidon		64	176	320	352	368	368	368	352
In Conversion/Overhaul	160	272	208	144	144	160	192	160	144
Subtotal	656	656	656	656	656	656	656	656	656
Total ICBM and SLBM Launchers	1710	1710	1710	1710	1701	1701	1692	1692	1683

ABM Levels will be varied in excursions to the Baseline Forces.

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U.S. Baseline Forces

Option III

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Intercontinental Bombers (UE)									
B-52	345	285	285	285	285	285	285	285	285
B-58	75	75	75	75					
FB-111	30	60	60	60	60	60	60	60	60
Land Based ICBM Launchers *									
On Line:									
Titan	54	54	54	54	45	45	36	36	27
Minuteman I	450	350	207	47					
Minuteman II	494	494	494	487	480	473	466	459	452
Minuteman III (2 RV)	5	55	120	204	257	261	264	268	271
Minuteman III (3 RV)	5	55	120	203	257	260	264	267	271
In Modernization/494L	46	46	59	59	6	6	6	6	6
Subtotal	1054	1054	1054	1054	1045	1045	1036	1036	1027
Sea Based Missile Launchers *									
On Line:									
Polaris (A-2)	128	128	128	16	0	0	0	0	0
Polaris(A-3)	368	192	144	176	160	128	96	128	160
Poseidon		64	176	320	352	368	368	368	352
In Conversion/Overhaul	160	272	208	144	144	160	192	160	144
Subtotal	656	656	656	656	656	656	656	656	656
Total ICBM and SLBM Launchers	1710	1710	1710	1710	1701	1701	1692	1692	1683

ABM Levels will be varied in excursions to the Baseline Forces.

* The mix of land-based and sea-based offensive missile launchers will be examined as a variant.

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U.S. Baseline Forces

Option IV

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Intercontinental Bombers (UE)									
B-52	345	285	285	285	285	285	285	285	285
B-58	75	75	75	75					
FB-111	30	60	60	60	60	60	60	60	60
Land Based ICBM Launchers									
On Line:									
Titan	54	54	54	54	45	45	36	36	27
Minuteman I	450	350	207	47					
Minuteman II	504	604	734	894	994	994	994	994	994
Minuteman III (2 RV)									
Minuteman III (3 RV)									
In Modernization/494L	46	46	59	59	6	6	6	6	6
Subtotal	1054	1054	1054	1054	1045	1045	1036	1036	1027
Sea Based Missile Launchers									
On Line:									
Polaris (A-2)	128	128	128	16	0	0	0	0	0
Polaris(A-3)	368	192	144	176	160	128	96	128	160
Poseidon		64	176	320	352	368	368	368	352
In Conversion/Overhaul	160	272	208	144	144	160	192	160	144
Subtotal	656	656	656	656	656	656	656	656	656
Total ICBM and SLBM Launchers	1710	1710	1710	1710	1701	1701	1692	1692	1683

ABM Levels will be varied in excursions to the Baseline Forces.

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B-52 Bomber Loadings
(Day-to-Day Alert a/)

	FY 72	73	74	75	76	77	78
B-52 with SRAM/SCAD	3	9	9	15	27	33	33
Average No. SRAMS per Alert B-52	20	20	11	8	6	5	5
Average No. SCADS per Alert B-52			3	4	5	5	5
Average No. Unarmed SCADS per Alert B-52			6	8	9	10	10

a/ It is assumed that 60% of the SRAM/SCAD inventory is required for day-to-day alert loadings (B-52 and FB-111), and that 80% could be available for generated alert loadings. For generated alerts, all alert FB-111s are loaded with 4 SRAM, with the B-52s utilizing the remainder.

U.S. Force Characteristics

Weapon	Number Independently Targetable Warheads	Yield	CEP	Area Aim Points	Terminal Aim Points	Alert Rates Day-to-Day	Alert Rates Generated	Reliability Launch a/	Reliability In-Flight b/
Titan	1	9.0	.90	1	1	.95	.95	.95	.82
Minuteman I	1	1.2	.80	1	1	.95	.95	.95	.89
Minuteman II	1	1.2	.35	9	1	.95	.95	.95	.89
Minuteman III	3	.17	.25	15	3	.95	.95	.95	.86
Minuteman III	2	.17	.25	12c/	12c/	.95	.95	.95	.86
Polaris A-2	1	1.1	1.0	1	1	0.72	1.0	.95	.90
Polaris A-3	1	1.1d/	.80	1	3	.72	1.0	.95	.90
Poseidon (MIRV)	10	.04	.16e/	10	10	.72	1.0	.95	.87
Poseidon (A-3 WH)g/	1	1.1d/	.80	9	6	.72	1.0	.95	.90
ULMS	10	.04	.16	10	10	.83	1.0	.95	.87
Alert B-52 w/Bombs	5.2	1.37	.20	NA	NA	.40	.80	.98	.97h/
Alert B-58 w/Bombs	5	1.96	.20	NA	NA	.40	.80	.98	.97
Alert FB-111f/w/SRAM	4	.2	.33	NA	NA	.40	.80	.98	.87
SCAD	1	.2	.09	NA	NA	NA	NA	.90	0.93

a/ Probability of successful launch of an alert weapon.

b/ Includes warhead reliability.

c/ Prior to FY 74 MMIII with 2 RVs will have 15 area aim points and 2 terminal aim points.

d/ Polaris A-3 and Poseidon with A-3 have 3 MRVs, each with a yield of .225 MT. The equivalent yield of the 3 warheads is 1.1 MT.

e/ Polaris CEP is .25 prior to FY 74.

f/ In FY 70, 71 the FB-111s each carry 4 bombs with an average yield of .54 MT per bomb.

g/ Includes the Antelope penaids.

h/ For B-52 with SRAMs the in-flight reliability is 0.87.

U.S. Base Line Air Defenses
(Fixed for all Options)

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Aircraft (AAI)									
Air Force									
F-101	134	134	134	134	134				
F-102	29								
F-104	26	26	26	26	26				
F-106	238	238	238	219					
F-106X				19	238	238	238	238	238
Air National Guard									
F-102	345	285	285	285	107	28	28	28	28
SAMs on Site a/									
BOMARC	148	140	132	124					
Nike (Hercules and Ajax)									
Army	861	861	861	861	861	861	861	861	861
ANG	717	717	717	717	717	717	717	717	717
HAWK (Regular)	288	288	288	288	288	288	288	288	288
SAM Batteries									
BOMARC (Squadrons)	6	6	6	6					
Nike (Hercules and Ajax)									
Army	50	50	50	50	50	50	50	50	50
ANG	47	47	47	47	47	47	47	47	47
HAWK (Regular)	8	8	8	8	8	8	8	8	8

a/ Equivalent to deployed operational missiles. Excludes training launchers.

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TAB C

ESTIMATED COSTS OF U.S. FORCES

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U.S. ESTIMATED COST - NSSM 28 OPTION I-III a/
($ in Millions)

	FY 70	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76	FY 77	FY 78	Average FY70-78	Average FY 71-77
BOMBERS	1900	1850	1500	1350	1350	1350	1250	1200	1200		
ICBM's	1600	1400	1100	550	500	500	500	500	500		
SLBM's	2250	2400	2250	2000	2000	1750	1250	1250	1250		
ABM's	900	1150	500	300	250	200	150	150	150		
AIR DEFENSE	900	1350	1400	1450	1750	1750	1750	1750	1750		
OTHER b/	2450	2550	2500	2500	2550	2600	2750	2650	2650		
TOTAL STRATEGIC FORCES	10000	10700	9250	8150	8400	8150	7650	7500	7500	8600	8550
PROGRAM III c/	5000	5000	5000	5000	5000	5000	5000	5000	5000		
PROGRAM VI d/	1150	1150	1150	1150	1150	1150	1150	1150	1150		
TOTAL	16150	16850	15400	14300	14550	14300	13800	13650	13650	14750	14700

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a/ Includes SAFEGUARD PHASE I Costs.
b/ Includes BOS, Training, Command, Family Housing and Allocated Portions of Programs VII & VIII.
c/ Allocated Portion of Intelligence and Communications.
d/ Allocated Portion of Research and Development.

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U.S. ESTIMATED COST-NSSM 28 OPTION III - VARIANT a/

($ in Millions)

	FY 70	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76	FY 77	FY 78	Average FY70-78	Average FY71-77
BASELINE FORCE b/	15000	15400	14600	13750	14050	13850	13300	13150	13150	14000	14000
PLUS											
0 ABM	15700	16050	15200	14250	14500	14250	13750	13600	13600	14550	14500
200 ABM	15850	16250	15750	14900	14850	14450	13900	13700	13700	14800	14800
500 ABM	16100	16600	15800	14900	15200	14800	14100	13800	13800	15000	15050
1500 ABM	17050	17800	16500	15400	15500	14800	14100	13900	13900	15450	15450
2500 ABM	17250	18700	18100	17500	17000	15700	14950	14750	14750	16500	16650
5000 ABM	17300	19000	18700	18400	18700	18100	16650	15500	15300	17500	17850

a/ Includes Programs III and VI

b/ Does not include SAFEGUARD PHASE I

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SECRET

DECLASSIFIED
SECRET

U.S. ESTIMATED COST - NSSM 28 OPTION IV a/
($ in Millions)

	FY 70	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76	FY 77	FY 78	Average FY70-78	Average FY71-77
BOMBERS	1900	1850	1500	1350	1350	1350	1250	1200	1200		
ICBM's	1450	1250	1100	700	500	500	500	500	500		
SLBM's	2250	2400	2250	2000	2000	1750	1250	1250	1250		
ABM's	900	1150	500	300	250	200	150	150	150		
AIR DEFENSE	900	1350	1400	1450	1750	1750	1750	1750	1750		
OTHER b/	2450	2550	2500	2500	2550	2600	2750	2650	2650		
TOTAL STRATEGIC FORCES	9850	10550	9250	8300	8400	8150	7650	7500	7500	8550	8550
PROGRAM III c/	5000	5000	5000	5000	5000	5000	5000	5000	5000		
PROGRAM VI d/	1150	1150	1150	1150	1150	1150	1150	1150	1150		
TOTAL	16000	16700	15400	14450	14550	14300	13800	13650	13650	14700	14700

a/ Includes SAFEGUARD PHASE I Cost.
b/ Includes BOS, Training, Command, Family Housing and Allocated Portions of Programs VII & VIII.
c/ Allocated Portion of Intelligence and Communications.
d/ Allocated Portion of Research and Development.

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TAB D

SOVIET FORCES

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SOVIET FORCES a/

OPTION I

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Intercontinental Bombers (UE)									
BEAR	30	30	30	25	20	5	0	0	0
BEAR with ASMs	80	80	80	80	80	80	70	60	50
BISON	30	30	25	20	20	15	10	0	0
Total UE Intercontinental Bombers	140	140	135	125	120	100	80	60	50
Land-Based ICBM Launchers (On-Line) b/									
Soft ICBM Launchers									
SS-7/8	142	60	30	0	0	0	0	0	0
SS-Z-3 (Retrofit)	0	0	0	0	0	0	0	0	0
Hard ICBM Launchers									
SS-7	69	69	69	30	0	0	0	0	0
SS-8	9	0	0	0	0	0	0	0	0
SS-9	198	156	126	126	96	36	0	0	0
SS-9 (MRV)	30	90	120	120	120	120	96	0	0
SS-Z-3 (Single RV)	0	24	24	24	24	24	24	24	24
SS-Z-3 (MIRV)	0	0	24	96	126	126	126	126	126
SS-Z-3 (Retrofit)(MIRV)	0	0	0	0	30	90	150	246	246
SS-11	800	800	700	500	300	100	0	0	0
SS-Z-9 (Retrofit)	0	0	100	300	500	700	800	800	800
SS-13	50	100	100	100	70	0	0	0	0
SS-Z-10 (Retrofit)	0	0	0	0	30	100	100	100	100
Mobile ICBM Launchers									
SS-13	0	0	0	0	0	0	0	0	0
SS-Z-10 (Retrofit)	0	0	0	0	0	0	0	0	0
Total Land-Based ICBM Launchers (On-Line)	1298	1299	1293	1296	1296	1296	1296	1296	1296

a/ Includes only those Soviet weapons used in the force effectiveness calculations. The NIPP estimates that SLBMs on diesel submarines and submarine-launched cruise missiles would not be used against CONUS. These weapons were not used in the calculations.

b/ Does not include R&D or training launchers.

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SOVIET FORCES (Cont'd)

OPTION I

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
SLBM Launchers a/									
On-Line									
SS-N-5	24	24	24	30	24	24	24	24	24
SS-N-6	208	336	464	528	432	384	320	272	208
SS-NZ-1 (Retrofit)(MIRV)	0	0	0	0	160	320	480	640	800
In Conversion/Overhaul	6	6	6	64	134	150	182	198	230
Total SLBM Launchers on SSBNs	238	366	494	622	750	878	1006	1134	1262

a/ Includes only those Soviet weapons used in the force effectiveness calculations. The NIPP estimates that SLBMs on diesel submarines and submarine-launched cruise missiles would not be used against CONUS. These weapons were not used in the calculations.

SOVIET FORCES a/

OPTION II

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Intercontinental Bombers (UE)									
BEAR	30	30	30	25	20	5	0	0	0
BEAR with ASMs	80	80	80	80	80	80	70	60	50
BISON	30	30	25	20	20	15	10	0	0
Total UE Intercontinental Bombers	140	140	135	125	120	100	80	60	50
Land-Based ICBM Launchers (On-Line) b/									
Soft ICBM Launchers									
SS-7/8	142	74	30	0	0	0	0	0	0
SS-Z-3 (Retrofit)	0	0	0	0	0	0	0	0	0
Hard ICBM Launchers									
SS-7	69	69	69	30	0	0	0	0	0
SS-8	9	9	0	0	0	0	0	0	0
SS-9	198	156	126	126	96	36	0	0	0
SS-9 (MRV)	30	90	120	120	120	120	96	0	0
SS-Z-3 (Single RV)	0	24	24	24	24	24	24	24	24
SS-Z-3 (MIRV)	0	0	24	78	78	78	78	78	78
SS-Z-3 (Retrofit)(MIRV)	0	0	0	0	30	90	150	246	246
SS-11	800	800	700	500	300	100	0	0	0
SS-Z-9 (Retrofit)	0	0	100	300	500	700	800	800	800
SS-13	50	50	50	50	20	0	0	0	0
SS-Z-10 (Retrofit)	0	0	0	0	30	50	50	50	50
Mobile ICBM Launchers									
SS-13	0	20	50	50	50	0	0	0	0
SS-Z-10 (Retrofit)	0	0	0	0	50	100	100	100	100
Total Land-Based ICBM Launchers (On-Line)	1298	1292	1293	1278	1298	1298	1298	1298	1298

a/ Includes only those Soviet weapons used in the force effectiveness calculations. The NIPP estimates that SLBMs on diesel submarines and submarine-launched cruise missiles (except for the long-range cruise missile) would not be used against CONUS. These weapons were not used in the calculations, but were included in the overall level of frozen Soviet missile launchers.

b/ Does not include R&D or training launchers.

SOVIET FORCES (Cont'd)

OPTION II

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
SLBM Launchers a/									
On-Line									
SS-N-5	24	24	24	30	24	24	24	24	24
SS-N-6	208	336	416	352	272	192	96	32	0
SS-NZ-1 (Retrofit)(MIRV)	0	0	0	0	80	160	240	320	336
Long-Range Cruise Missile	0	0	0	14	70	134	198	240	208
In Conversion/Overhaul	6	6	22	80	86	86	102	100	148
Total SLBM Launchers on SSBNs	238	366	462	476	532	596	660	716	716

a/ Includes only those Soviet weapons used in the force effectiveness calculations. The NIPP estimates that SLBMs on diesel submarines and submarine-launched cruise missiles (except for the long-range cruise missile) would not be used against CONUS. These weapons were not used in the calculations, but were included in the overall level of frozen Soviet missile launchers.

SOVIET FORCES a/

OPTION III

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Intercontinental Bombers (UE)									
BEAR	30	30	30	25	20	5	0	0	0
BEAR with ASMs	80	80	80	80	80	80	70	60	50
BISON	30	30	25	20	20	15	10	0	0
Total UE Intercontinental Bombers	140	140	135	125	120	100	80	60	50
Land-Based ICBM Launchers (On-Line) b/									
Soft ICBM Launchers									
SS-7/8	142	128	108	106	56	26	0	0	0
SS-Z-3 (Retrofit) (Single RV)	0	8	8	8	8	8	8	8	8
SS-Z-3 (Retrofit) (MIRV)	0	0	20	22	72	102	128	128	128
Hard ICBM Launchers									
SS-7	69	69	45	0	0	0	0	0	0
SS-8	9	0	0	0	0	0	0	0	0
SS-9	198	156	126	126	96	36	0	0	0
SS-9 (MRV)	30	90	120	120	120	120	96	0	0
SS-Z-3	0	0	0	0	0	0	0	0	0
SS-Z-3 (Retrofit) (MIRV)	0	0	24	69	99	159	219	315	315
SS-11	800	800	700	500	300	100	0	0	0
SS-Z-9 (Retrofit)	0	9	109	309	509	709	809	809	809
SS-13	40	40	40	40	20	0	0	0	0
SS-Z-10 (Retrofit)	0	0	0	0	20	40	40	400	40
Mobile ICBM Launchers									
SS-13	0	0	0	0	0	0	0	0	0
SS-Z-10 (Retrofit)	0	0	0	0	0	0	0	0	0
Total Land-Based ICBM Launchers (On-Line)	1288	1300	1300	1300	1300	1300	1300	1300	1300

a/ Includes only those Soviet weapons used in the force effectiveness calculations. The NIPP estimates that SLBMs on diesel submarines and submarine-launched cruise missiles (except for the long-range cruise missile) would not be used against CONUS. These weapons were not used in the calculations, but were included in the overall levels of frozen Soviet missile launchers.

b/ Does not include R&D or training launchers.

SOVIET FORCES (Cont'd)

OPTION III

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
SLBM Launchers a/									
On-Line									
SS-N-5	24	24	24	30	24	24	24	24	24
SS-N-6	208	336	352	288	208	192	112	32	0
SS-NZ-1 (Retrofit) (MIRV)	0	0	0	0	80	160	240	320	352
Long-Range Cruise Missile	0	0	0	14	70	134	198	240	208
In Conversion/Overhaul	6	6	22	80	86	86	86	100	132
Total SLBM Launchers on SSBNs	238	366	398	412	468	596	660	716	716

a/ Includes only those Soviet weapons used in the force effectiveness calculations. The NIPP estimates that SLBMs on diesel submarines and submarine-launched cruise missiles (except for the long-range cruise missile) would not be used against CONUS. These weapons were not used in the calculations, but were included in the overall levels of frozen Soviet missile launchers.

SOVIET FORCES a/

OPTION IV

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Intercontinental Bombers (UE)									
BEAR	30	30	30	25	20	5	0	0	0
BEAR with ASMs	80	80	80	80	80	80	70	60	50
BISON	30	30	25	20	20	15	10	0	0
Total UE Intercontinental Bombers	140	140	135	125	120	100	80	60	50
Land-Based ICBM Launchers (On-Line) b/									
Soft ICBM Launchers									
SS-7/8	142	128	108	106	56	26	0	0	0
SS-Z-3 (Retrofit)	0	8	28	30	80	110	136	136	136
Hard ICBM Launchers									
SS-7	69	69	45	0	0	0	0	0	0
SS-8	9	0	0	0	0	0	0	0	0
SS-9	228	246	246	246	216	156	96	0	0
SS-9 (MRV)	0	0	0	0	0	0	0	0	0
SS-Z-3	0	0	0	0	0	0	0	0	0
SS-Z-3 (Retrofit)	0	0	24	69	99	159	219	315	315
SS-11	800	800	700	500	300	100	0	0	0
SS-Z-9 (Retrofit)	0	9	109	309	509	709	809	809	809
SS-13	40	40	40	40	20	0	0	0	0
SS-Z-10 (Retrofit)	0	0	0	0	20	40	40	40	40
Mobile ICBM Launchers									
SS-13	0	0	0	0	0	0	0	0	0
SS-Z-10 (Retrofit)	0	0	0	0	0	0	0	0	0
Total Land-Based ICBM Launchers (On-Line)	1288	1300	1300	1300	1300	1300	1300	1300	1300

a/ Includes only those Soviet weapons used in the force effectiveness calculations. The NIPP estimates that SLBMs on diesel submarines and submarine-launched cruise missiles (except for the long-range cruise missile) would not be used against CONUS. These weapons were not used in the calculations, but were included in the overall level of frozen Soviet missile launchers.

b/ Does not include R&D or training launchers.

SOVIET FORCES (Cont'd)

OPTION IV

	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
SLBM Launchers a/									
On-Line									
SS-N-5	24	24	24	30	24	24	24	24	24
SS-N-6	208	336	352	288	208	192	112	32	0
SS-NZ-1 (Retrofit)	0	0	0	0	80	160	240	320	352
Long-Range Cruise Missile	0	0	0	14	70	134	198	240	208
In Conversion/Overhaul	6	6	22	80	86	86	86	100	132
Total SLBM Launchers on SSBNs	238	366	398	412	468	596	660	716	716

a/ Includes only those Soviet weapons used in the force effectiveness calculations. The NIPP estimates that SLBMs on diesel submarines and submarine-launched cruise missiles (except for the long-range cruise missile) would not be used against CONUS. These weapons were not used in the calculations, but were included in the overall level of frozen Soviet missile launchers.

SOVIET AIR DEFENSES a/

OPTIONS I-IV

	FY69	FY70	FY71	FY72	FY73	FY74	FY75	FY76	FY77	FY78
Fighter Aircraft										
Fresco/Farmer/Flashlight	1825	1625	1325	1000	675	425	150	50	0	0
Fitter/Fishpot/Firebar	1225	1200	1175	1150	1125	1075	1050	1025	975	925
Fiddler/Flagon	350	500	650	800	925	950	975	975	975	975
Foxbat	0	25	50	100	175	250	325	350	400	400
Total Fighter Aircraft	3400	3350	3200	3050	2900	2700	2500	2400	2350	2300
AWAC Radars										
Flat Jack	10	20	30	35	35	35	35	35	35	35
Overland AWAC Radar	0	0	0	0	0	0	5	10	15	20
Ground Radars	4500	4600	4700	4700	4700	4700	4700	4600	4400	4000
SAM Launchers										
SA-1	700	700	700	500	350	200	--	--	--	--
SA-2	5100	5000	4900	4700	4500	4300	4300	4300	4300	4300
SA-3	600	700	800	800	800	800	800	800	800	800
SA-5	750	1100	1400	1700	1900	1900	1900	1900	1900	1900
SA-Z-1	--	--	60	150	450	900	1200	1350	1500	1500
SA-Z-4	--	--	--	--	--	--	--	--	60	300
Total SAM Launchers	7100	7400	7760	7850	7950	8100	8200	8350	8360	8500

a/ High NIPP air defenses for all options.

SOVIET FORCE CHARACTERISTICS

Weapon	Number of Independently Targetable Warheads	Yield (MT)	CEP (NM)	Area Aim Points	Terminal Aim Points	Alert Rates: Day-to-Day	Alert Rates: Generated	Reliability: Launch a/	Reliability: In-Flight b/
Land-Based ICBMs									
SS-7	1	3/5 c/	1.0	1	1	.85 f/	.95	.90	.90
SS-8	1	3/5 c/	1.0	1	1	0	.95	.80	.81
SS-9	1	12/25 d/	0.5	1	1	.90	.95	.90	.86
SS-9 (MRV)	1 e/	3.5	0.5	1	3	.90	.95	.90	.86
SS-Z-3	1	40	0.25	1	1	.90 f/	.95	.85	.86
SS-Z-3 (MIRV)	6	1.2	0.25	6	6	.90 f/	.95	.85	.77
SS-11	1	1.2	1.0	1	1	.90	.95	.95	.90
SS-Z-9	1	1.2	0.25	1	1	.90	.95	.95	.90
SS-13	1	0.6	1.0	1	1	.90	.95	.90	.86
SS-Z-10	1	1.2	0.5	1	1	.90	.95	.90	.86
SS-13 (Mobile)	1	0.6	1.5	1	1	0	.95	.87	.82
SS-Z-10 (Mobile)	1	1.2	1.0	1	1	0	.95	.87	.82
SLBMs									
SS-N-5	1	1.2	1.0	1	1	.30 g/	.50 g/	.90	.86
SS-N-6	1	1.2	1.0	1	1	.30 g/	.50 g/	.85	.81
SS-NZ-1	1	1.2	0.75	1	1	.30 g/	.50 g/	.85	.81
SS-NZ-1 (MIRV)	3	0.4	0.75	3	3	.30 g/	.50 g/	.85	.81
Long-Range Cruise Missile	1	1.2	1.0	1	1	.30 g/	.50 g/	.85	.81
Bombers									
BEAR	2	5	0.2	-	-	0	.67	.98	.82
BEAR with ASM	1	5	1.0	-	-	0	.67	.98	.62
BISON	2	5	0.2	-	-	0	.67	.98	.82

a/ Probability of successful launch of an alert weapon.
b/ Includes warhead reliability.
c/ 3 MT when on soft launchers and 5 MT when on hard launchers.
d/ Half of the SS-9s have 12 MT and half have 25 MT when there are no MRVs on the SS-9.
e/ The SS-9 with MRVs carries three 3.5 MT warheads. These warheads cannot be targeted to more than one target.
f/ Hard launchers only. There are no ICBMs on day-to-day alert in soft launchers.
g/ This alert rate applies to the total SLBM force, including those in conversion and overhaul, after 1974. See NIPP-69 for SLBM alert rates in 1970-74.

TAB E

ESTIMATED COSTS OF SOVIET FORCES

Table 1

Estimated Soviet Expenditures for
Strategic Offensive & Defensive Forces a/
NSSM-28: Basic Option 1
Calendar Years 1969-1978

Billion 1966 Dollars

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average Annual 1969-78
NSSM-28: Strategic Attack											
Bombers (Intercontinental)	0.37	0.34	0.34	0.34	0.32	0.30	0.27	0.23	0.19	0.16	0.29
Bombers (Peripheral)	0.62	0.54	0.50	0.43	0.39	0.35	0.34	0.32	0.30	0.25	0.40
ICBMs	2.96	2.75	2.53	3.00	3.22	3.00	2.53	2.15	1.42	0.72	2.43
SSBN Submarines	1.18	1.21	1.36	1.52	1.55	1.68	1.61	1.70	1.46	0.68	1.40
Subtotal	5.13	4.84	4.73	5.29	5.48	5.33	4.75	4.40	3.37	1.81	4.51
NSSM-28: Strategic Defense (excluding ABMs) b/											
Interceptors	2.06	2.39	2.67	2.47	2.15	1.84	1.80	0.97	0.96	0.95	1.83
SAMs	2.65	2.63	2.73	2.86	2.82	2.59	2.47	2.56	2.78	2.92	2.70
AWACS	0.20	0.20	0.20	0.06	0.03	0.03	0.03	0.04	0.04	0.05	0.09
Radar	0.73	0.77	0.84	0.91	0.94	0.94	0.95	0.95	0.90	0.88	0.88
Subtotal	5.64	5.99	6.44	6.30	5.94	5.40	5.25	4.52	4.68	4.80	5.50
NSSM-28: Total Strategic Expenditures	10.77	10.83	11.17	11.59	11.42	10.73	10.00	8.92	8.05	6.61	10.01

a. Excluding expenditures for nuclear weapons.
b. For ABM expenditures see Alternative Variants of ABM levels in Table 5.

Table

Estimated Soviet Expenditures for
Strategic Offensive & Defensive Forces a/
NSSM-28: Basic Option 2
Calendar Years 1969-1978

Billion 1966 Dollars

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average Anuual 1969-78
NSSM-28: Strategic Attack											
Bombers (Intercontinental)	0.37	0.34	0.34	0.34	0.32	0.30	0.27	0.23	0.19	0.16	0.29
Bombers (Peripheral)	0.62	0.54	0.50	0.43	0.39	0.35	0.34	0.32	0.30	0.25	0.40
ICBMs	2.93	2.62	2.55	2.76	2.90	2.98	2.60	2.18	1.45	0.73	2.37
SSBN Submarines	1.25	1.19	1.78	0.32	0.62	0.62	0.62	0.62	0.58	0.34	0.79
Cruise Missile Submarines b/			0.02	0.08	0.15	0.19	0.22	0.19	0.14	0.14	0.14c/
Subtotal	5.17	4.69	5.19	3.93	4.38	4.44	4.05	3.54	2.66	1.62	3.97
NSSM-28: Strategic Defense (excluding ABMs) d/											
Interceptors	2.06	2.39	2.67	2.47	2.15	1.84	1.80	0.97	0.96	0.95	1.83
SAMs	2.65	2.63	2.73	2.86	2.82	2.59	2.47	2.56	2.78	2.92	2.70
AWACS	0.20	0.20	0.20	0.06	0.03	0.03	0.03	0.04	0.04	0.05	0.09
Radar	0.73	0.77	0.84	0.91	0.94	0.94	0.95	0.95	0.90	0.88	0.88
Subtotal	5.64	5.99	6.44	6.30	5.94	5.40	5.25	4.52	4.68	4.80	5.50
NSSM-28: Total Strategic Expenditures	10.81	10.68	11.63	10.23	10.32	9.84	9.30	8.06	7.34	6.42	9.46

a. Excluding expenditures for nuclear weapons.
b. Cruise Missile Submarines, because of their assigned mission in this option, are included with Strategic Attack and comprise only outlays for conversions, follow-ons, missiles, and operating costs.
c. Average annual expenditures for 1971-78.
d. For ABM expenditures, see Alternative Variants of ABM levels in Table 5.

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Table

Estimated Soviet Expenditures for
Strategic Offensive & Defensive Forces a/
NSSM-28: Basic Option 3
Calendar Years 1969-1978

Billion 1966 Dollars

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average Annual 1969-78
NSSM-28: Strategic Attack											
Bombers (Intercontinental)	0.37	0.34	0.34	0.34	0.32	0.30	0.27	0.23	0.19	0.16	0.29
Bombers (Peripheral)	0.62	0.54	0.50	0.43	0.39	0.35	0.34	0.32	0.30	0.25	0.40
ICBMs	2.72	2.05	2.07	2.58	3.02	3.23	2.87	2.32	1.44	0.79	2.31
SSBN Submarines	1.25	0.98	0.44	0.29	0.77	0.82	0.62	0.62	0.62	0.40	0.68
Cruise Missile Submarines b/			0.02	0.08	0.15	0.19	0.22	0.19	0.14	0.14	0.14c/
Subtotal	4.96	3.91	3.37	3.72	4.65	4.89	4.32	3.68	2.69	1.74	3.79
NSSM-28: Strategic Defense (excluding ABMs) d/											
Interceptors	2.06	2.39	2.67	2.47	2.15	1.84	1.80	0.97	0.96	0.95	1.83
SAMs	2.65	2.63	2.73	2.86	2.82	2.59	2.47	2.56	2.78	2.92	2.70
AWACS	0.20	0.20	0.20	0.06	0.03	0.03	0.03	0.04	0.04	0.05	0.09
Radar	0.73	0.77	0.84	0.91	0.94	0.94	0.95	0.95	0.90	0.88	0.88
Subtotal	5.64	5.99	6.44	6.30	5.94	5.40	5.25	4.52	4.68	4.80	5.50
NSSM-28: Total Strategic Expenditures	10.60	9.90	9.81	10.02	10.59	10.29	9.57	8.20	7.37	6.54	9.29

a. Excluding expenditures for nuclear weapons.
b. Cruise Missile Submarines, because of their assigned mission in this option, are included with Strategic Attack and comprise only outlays for conversions, follow-ons, missiles, and operating costs.
c. Average annual expenditures for 1971-78.
d. For ABM expenditures, see Alternative Variants of ABM levels in Table 5.

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Table

Estimated Soviet Expenditures for
Strategic Offensive & Defensive Forces a/
NSSM-28: Basic Option 4
Calendar Years 1969-1978

Billion 1966 Dollars

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average Annual 1969-78
NSSM-28: Strategic Attack											
Bombers (Intercontinental)	0.37	0.34	0.34	0.34	0.32	0.30	0.27	0.23	0.19	0.16	0.29
Bombers (Peripheral)	0.62	0.54	0.50	0.43	0.39	0.35	0.34	0.32	0.30	0.25	0.40
ICBMs	2.66	1.89	1.85	2.36	2.81	2.96	2.59	2.06	1.35	0.79	2.13
SSBN Submarines	1.25	0.98	0.44	0.29	0.66	0.71	0.51	0.51	0.51	0.36	0.62
Cruise Missile Submarines b/			0.02	0.08	0.15	0.19	0.22	0.19	0.14	0.14	0.14c/
Subtotal	4.90	3.75	3.15	3.50	4.33	4.51	3.93	3.31	2.49	1.70	3.56
NSSM-28: Strategic Defense (excluding ABMs) d/											
Interceptors	2.06	2.39	2.67	2.47	2.15	1.84	1.80	0.97	0.96	0.95	1.83
SAMs	2.65	2.63	2.73	2.86	2.82	2.59	2.47	2.56	2.78	2.92	2.70
AWACS	0.20	0.20	0.20	0.06	0.03	0.03	0.03	0.04	0.04	0.05	0.09
Radar	0.73	0.77	0.84	0.91	0.94	0.94	0.95	0.95	0.90	0.88	0.88
Subtotal	5.64	5.99	6.44	6.30	5.94	5.40	5.25	4.52	4.68	4.80	5.50
NSSM-28: Total Strategic Expenditures	10.54	9.74	9.59	9.80	10.27	9.91	9.18	7.83	7.17	6.50	9.05

a. Excluding expenditures for nuclear weapons.

b. Cruise Missile Submarines, because of their assigned mission in this option, are included with Strategic Attack and comprise only outlays for conversions, follow-ons, missiles, and operating costs.

c. Average annual expenditures for 1971-78.

d. For ABM expenditures, see Alternative Variants of ABM levels in Table 5.

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ble 5

NSSM-28: Estimated Soviet Expenditures for
Alternative Variants of ABM Levels a/
Calendar Years 1969-1978

Billion 1966 Dollars

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average Annual 1969-78
ABM Level 1											
0 lchrs (radars only)	0.11	0.20	0.17	0.12	0.09	0.12	0.12	0.12	0.12	0.12	0.13
ABM Level 2 (Three Variants)											
64 lchrs (ABM-1 System)	0.22	0.26	0.23	0.18	0.15	0.18	0.18	0.18	0.18	0.18	0.19
100 lchrs b/	0.28	0.33	0.36	0.33	0.32	0.51	0.36	0.12	0.12	0.12	0.29
128 lchrs	0.37	0.41	0.46	0.36	0.30	0.36	0.36	0.36	0.36	0.36	0.37
ABM Level 3 (Two Variants)											
1000 area lchrs	0.22	0.43	0.71	1.28	1.67	1.80	1.51	1.06	0.89	0.92	
1500 terminal lchrs				0.13	0.23	0.76	1.23	2.07	2.58	2.78	
Total c/	0.22	0.43	0.71	1.41	1.90	2.56	2.74	3.13	3.47	3.70	2.03
64 lchrs/550 area lchrs d/	0.27	0.49	0.78	1.35	1.14	1.04	0.38	0.38	0.38	0.38	0.66
NIPP-69 Lo ABM	0.14	0.20	0.22	0.38	0.61	1.02	1.15	1.21	1.10	1.16	0.72
NIPP-69 Hi ABM	0.28	0.54	0.81	1.51	2.14	2.47	2.40	2.31	2.37	2.50	1.73
NIPP-68 Hi-Lo Intermediate Level	0.21	0.26	0.24	0.32	0.55	0.84	1.40	1.53	1.32		0.74 e/

a. Excluding expenditures for nuclear weapons.
b. Beginning in 1975, replacing 100 ABM-1 launchers with 100 ABM-Z-2 launchers on a one-to-one basis.
c. Expenditures for 64 ABM-1 launchers, 1000 ABM-Z-2 launchers and, 1500 ABM-Z-1 launchers.
d. 64 ABM-1 launchers from 1969 to 1972 and beginning deployment of 550 ABM-Z-2 launchers in 1973.
e. Average annual expenditures for 1969-77.

TAB F

STATIC COMPARISONS OF U.S. AND SOVIET FORCES

Table F-1

COMPARISON OF U.S. AND SOVIET STRATEGIC FORCES (1978)

	United States		Soviet Union				
	Programmed Force Options I,II,III	Option IV	High Nipp	Option I	Option II	Option III	Option IV
Total Intercontinental Strategic Force Loading a/							
Weapons							
Bombers	2300	2300	50	50	50	50	50
Land-Based Missiles	1900	1050	2300	3300	3100	3700	1500
Sea-Based Missiles	3800	500	700	2600	1200	1300	600
Total Weapons	8000	3850	3050	5950	4350	5050	2150
Megatons							
Bombers	2200	2200	250	250	250	250	250
Land-Based Missiles	1100	1500	5500	4400	4300	4600	11000
Sea-Based Missiles	300	550	800	1200	700	700	700
Total Megatons	3600	4250	6500	5850	5250	5550	11950
Equivalent Megatons b/							
Bombers	1900	1900	100	100	100	100	100
Land-Based Missiles	1000	1200	3100	3800	3500	4100	3200
Sea-Based Missiles	600	550	750	1100	800	800	650
Total Equivalent Megatons	3500	3650	3950	5000	4400	5000	3950
Missile Payload (Kilopounds)							
Land-Based Missiles	1800	1400	7100	6200	5800	6600	7200
Sea-Based Missiles	1400	600	1400	2100	1100	1200	1200
Total Missile Payload	3200	2000	8500	8300	6900	7800	8400
Alert Intercontinental Strategic Force Loading c/							
Weapons							
Bombers	1000	1000	0	0	0	0	0
Land-Based Missiles	1700	1000	2000	2800	2600	2500	1000
Sea-Based Missiles	2700	400	200	900	500	500	200
Total Alert Weapons	5400	2400	2200	3700	3100	3000	1200
Megatons							
Bombers	950	950	0	0	0	0	0
Land-Based Missiles	1000	1400	4400	3900	3700	3000	7000
Sea-Based Missiles	200	400	250	450	250	250	250
Total Alert Megatons	2150	2750	4650	4350	3950	3250	7250
Equivalent Megatons							
Bombers	800	800	0	0	0	0	0
Land-Based Missiles	1000	1100	2600	3200	2700	2700	2100
Sea-Based Missiles	400	400	200	550	300	300	250
Total Alert Equivalent Megatons	2200	2300	2800	3750	3000	3000	2350
Missile Payload (Kilopounds)							
Land-Based Missiles	1700	1300	6000	5200	4900	4400	4700
Sea-Based Missiles	1000	450	400	750	450	450	450
Total Alert Missile Payload	2700	1750	6400	5950	5350	4850	5150

a/ Includes AAI aircraft, ICBM launchers on-line plus research, development, and training launchers and those in modernization, and on-line SLBM launchers.

b/ Equivalent yield is calculated by taking yield to the one-half power for warheads greater than one megaton and to the two-thirds power for warheads less than one megaton. It is a measure of the capability of a warhead to cause urban/industrial damage.

c/ Day-to-day alert.

Table F-2

COMPARISON OF U.S. AND USSR POTENTIAL ICBM THROW WEIGHT (KILOPOUNDS) WITH HARDENED LAND-BASED LAUNCHERS

	U.S.	USSR
Hot Launch		
Option I	6800	7900
Option II	6800	7150
Option III	6000	6750
Option IV	6000	6750
Cold Launch		
Option I	9800	18,300
Option II	9800	16,550
Option III	9450	15,650
Option IV	9450	15,650

TAB G

WAR-FIGHTING CALCULATIONS

NO-YEAR CALCULATIONS

Use the 1978 U.S. and Soviet forces for no-year calculations, except for the SLBMs, which are treated as shown below. The number of aim points for Soviet multiple-silo ICBM launcher groups are also summarized below.

SLBMs

a. Soviet SLBMs. The NIPP gives Soviet SLBM alert (on-station) rates as fractions of total inventory (including those in conversion and overhaul). Using 1978 inventories as a base, the following table shows Soviet alert and non-alert SLBMs:

SOVIET SLBMs (1978)

	Day-to-Day Alert (30%)		Generated Alert (50%)	
	Alert	Non-Alert	Alert	Non-Alert
Option I				
SS-N-5	9	21	15	15
SS-N-6	130	302	216	216
SS-NZ-1	240	560	400	400
Options II/III/IV				
SS-N-5	9	21	15	15
SS-N-6	0	0	0	0
SS-NZ-1	130	302	216	216
Long-Range Cruise Missile	76	178	127	127

b. U.S. SLBMs. For no-year calculations, apply the following multiplier to total SLBM inventory to obtain the day-to-day alert (on-station) U.S. SLBMs:

alert rate = (1 - fraction of time in overhaul/conversion) x

(at-sea rate for on-line SSBNs)

$= 0.77 \times 0.72 = 0.55$

For generated alert, all on-line U.S. SLBMs are at sea.

The following table shows alert and non-alert U.S. SLBMs in 1978.

U.S. SLBMs (1978) a/

Options I/II/III/IV	Day-to-Day Alert (55%) Alert	Non-Alert	Generated Alert (77%) Alert	Non-Alert
Polaris (A-3)	88	72	123	37
Poseidon	273	223	382	114

a/ SLBMs for targets in China are included in these figures.

Soviet ICBM Aim Points

Soviet soft ICBM launchers are grouped with two launchers per site and their hard SS-7/8 launchers have three launchers per site. Since the launchers on one site are close enough together that they present one aim point in a counterforce strike, appropriate adjustments must be made to the data base for the constrained Soviet forces in which SS-Z-3 and SS-Z-9 missiles are retrofit to these silos. These adjustments are shown for 1978 in the following table.

SS-Z-3/SS-Z-9 (1978)

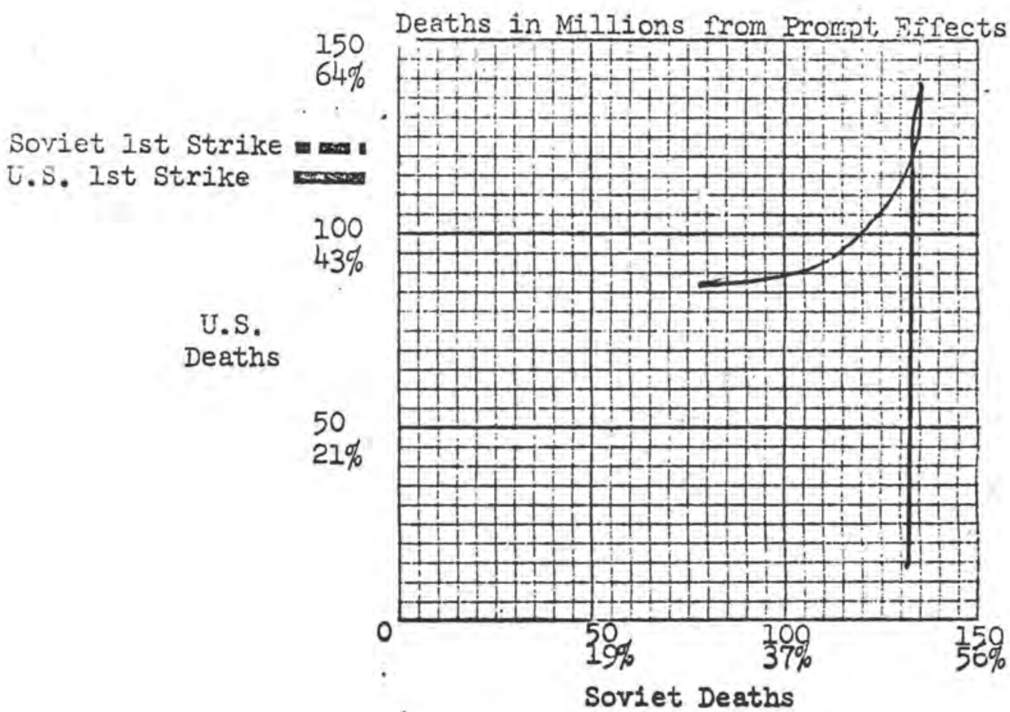
	Number of Weapons	Number of Aim Points
Option III		
SS-Z-3 (Single RV)(Soft)	8	4
SS-Z-3 (MIRV)(Soft)	128	64
SS-Z-3 (MIRV)(Hard)	315	269
SS-Z-9	809	803
Option IV		
SS-Z-3 (Single RV)(Soft)	136	68
SS-Z-3 (Single RV)(Hard)	315	269
SS-Z-9	809	803

AEM WAR-FIGHTING CALCULATIONS
(FY 78)

U.S. Programmed Forces vs High NIPP Forces

		Deaths (10^6)	
		U.S.	Soviet
Soviet First	CF	14	131
	CV	139	135
	MD	139	135
U.S. First	CF	87	78
	CV	139	135
	MD	107	126

War-fighting Curves



ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

Baseline Forces with: 0 Area ABM; 0 Terminal ABM (Cities);

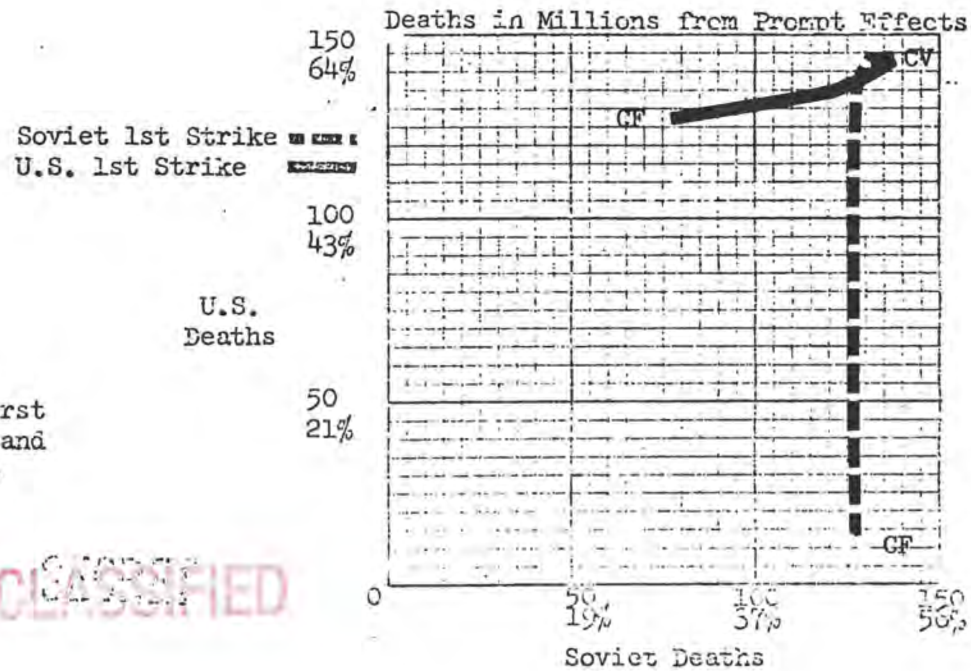
		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Soviet First	CF	14	127	41/.4	49	39/.9	17	33/.1	36	31/.2	9
	CV	144	136	41	65	40	26	33	50	32	17
	MD	142	130	12/29	52	13/27	18	10/23	39	11/21	11
U.S. First	CF	127	78	19	50/15	14	14/12	15	44/4	11	11/4
	CV	144	136	41	65	40	26	33	50	32	17
	MD	139	133	25	24/41	21	3/23	20	21/29	17	2/15

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF		
	CV		
	MD		
U.S. First	CF		
	CV		
	MD		

This is the Baseline Case for Option I.

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

Baseline Forces with: 200 Area ABM; 0 Terminal ABM (Cities);

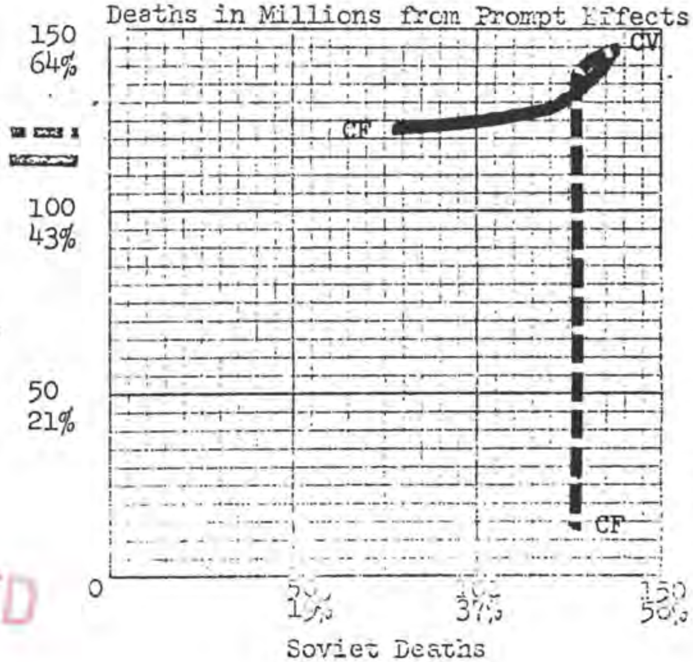
		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
Soviet	CF	14	126	41/.4	49	39/.9	17	31/.1	35	30/.2	9
	CV	144	136	41	65	40	26	31	50	30	17
First	MD	141	130	12/29	53	13/27	19	9/22	39	10/20	11
U.S.	CF	123	78	19	50/15	15	14/12	14	44/4	10	11/4
	CV	144	136	41	65	40	26	31	50	30	17
First	MD	135	130	23	28/37	20	3/23	17	25/25	14	3/14

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet	CF	.0	- .7
	CV	- .1	- .1
First	MD	- .7	+ .3
U.S.	CF	- 3.6	.0
	CV	- .1	- .1
First	MD	- 4.1	- 2.0

* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

War-fighting Curves



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ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

GROUP I

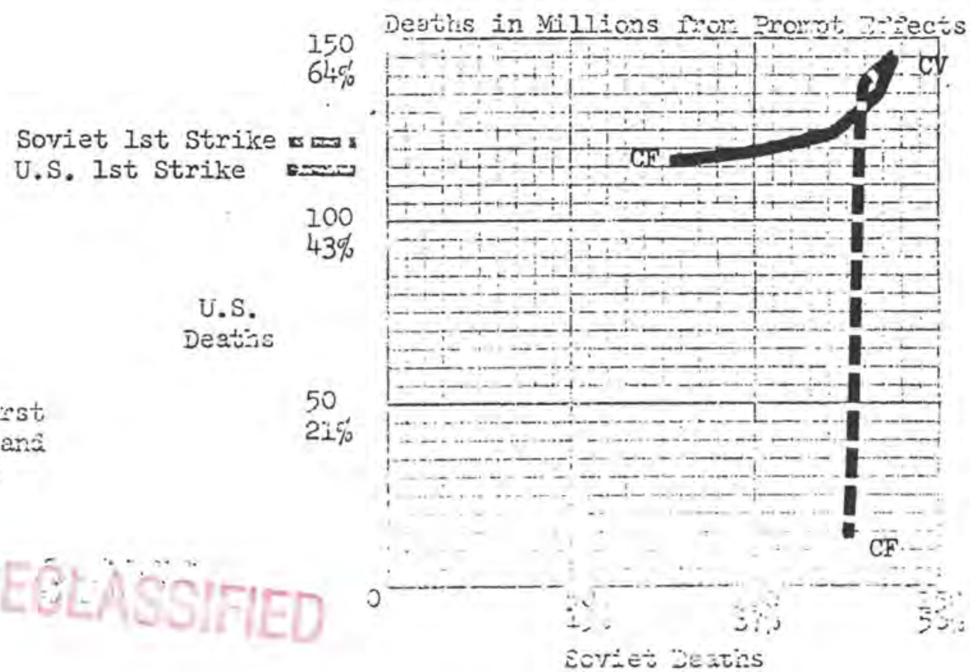
Baseline Forces with: 500 Area ABM; 0 Terminal ABM (Cities);

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
	CF	14	125	41/.4	50	39/.9	17	29/.1	34	27/.2	9
Soviet	CV	144	136	41	65	40	26	29	49	28	17
First	MD	140	131	11/30	54	12/28	19	8/21	38	11/17	11
	CF	117	78	19	50/15	15	14/12	11	43/4	9	11/4
U.S.	CV	144	136	41	65	40	26	29	49	28	17
First	MD	129	129	23	30/35	19	5/21	15	25/24	12	4/13

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	- .0	- 1.5
Soviet	CV	- .4	- .3
First	MD	- 1.8	+ 1.0
	CF	- 10.0	.0
U.S.	CV	- .4	- .1
First	MD	- 10.2	- 3.9

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

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AEM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

Baseline Forces with: 500 Area ABM; 1000 Terminal ABM (Cities);

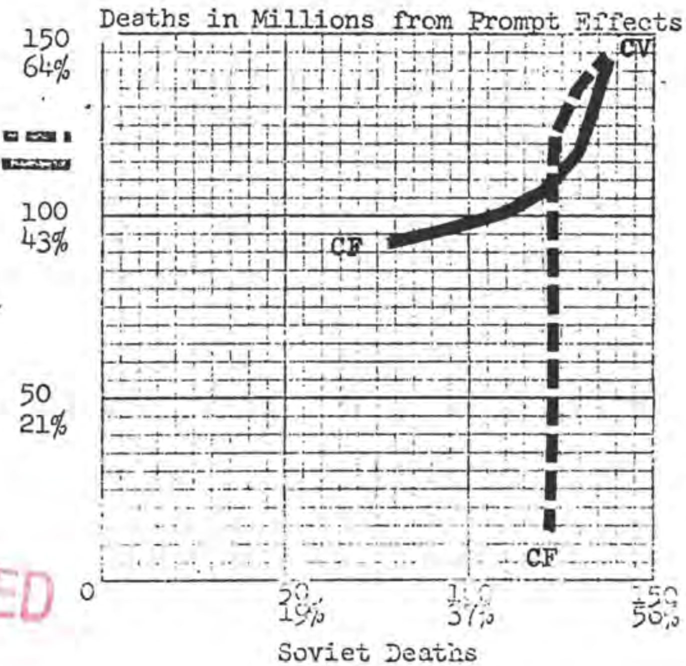
		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
	CF	14	123	41/.4	50	39/.9	17	29/.1	30	27/.2	8
Soviet	CV	143	136	41	65	40	26	21	47	22	16
First	MD	139	132	7/34	55	8/32	22	6/16	38	6/16	12
	CF	94	78	19	50/15	15	14/12	5	42/4	4	11/4
U.S.	CV	143	136	41	65	40	26	21	47	22	16
First	MD	110	125	23	32/33	19	4/22	8	27/21	7	4/12

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	- 3.9
Soviet	CV	- 1.7	- .5
First	MD	- 3.3	+ 2.1
	CF	- 33.3	.0
U.S.	CV	- 1.7	- .5
First	MD	- 29.3	- 7.4

War-fighting Curves

Soviet 1st Strike
U.S. 1st Strike



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

Baseline Forces with: 500 Area ABM; 2000 Terminal ABM (Cities);

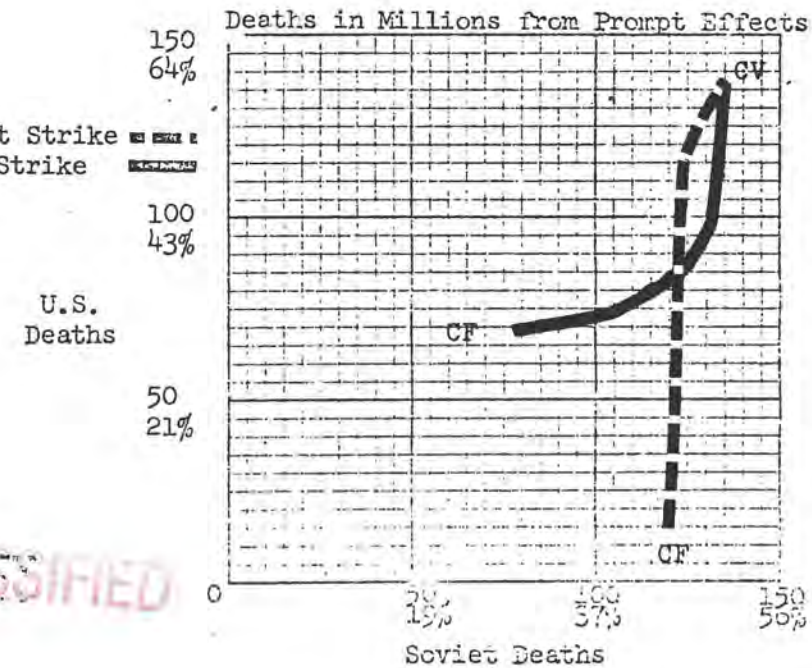
		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Soviet First	CF	14	120	41/.4	50	39/.9	17	29/.1	28	27/.2	8
	CV	137	135	41	65	40	26	14	46	15	15
	MD	137	135	41	65	40	26	14	46	15	15
U.S. First	CF	70	78	19	50/15	15	14/12	6	42/4	6	11/4
	CV	137	135	41	65	40	26	14	46	15	15
	MD	88	127	24	29/36	20	3/23	8	24/22	8	3/12

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	- 6.2
	CV	- 7.3	- .7
	MD	- 4.9	+ 5.3
U.S. First	CF	- 56.4	.0
	CV	- 7.3	- .7
	MD	- 51.7	- 6.1

War-fighting Curves

Soviet 1st Strike
U.S. 1st Strike



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

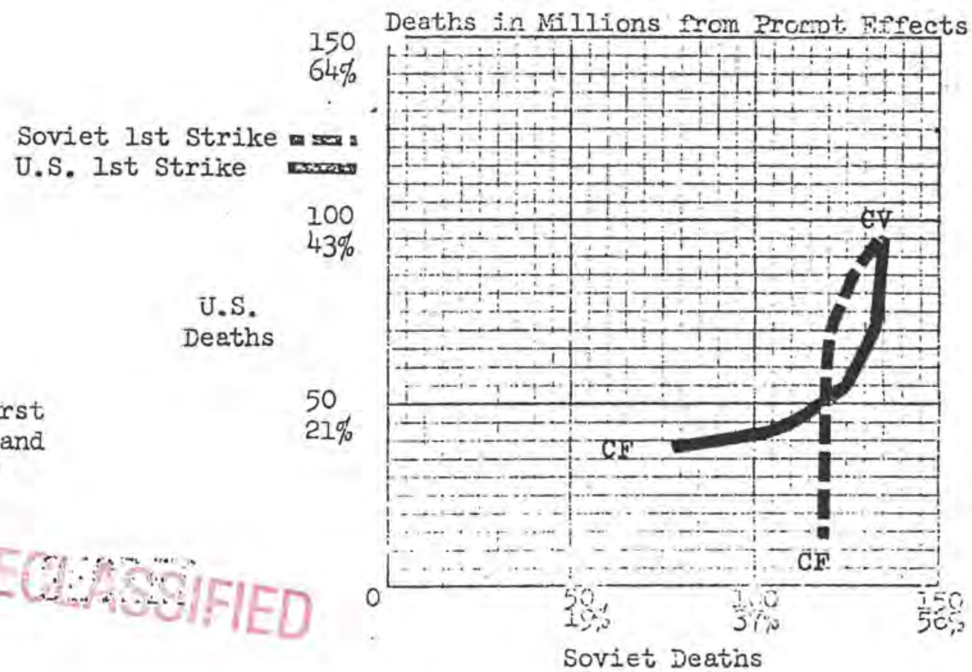
Baseline Forces with: 1000 Area ABM; 4000 Terminal ABM (Cities);

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
	CF	14	118	41/.4	51	39/.9	18	24/.1	26	23/.2	7
Soviet	CV	95	135	41	65	40	26	10	44	10	14
First	MD	95	135	41	65	40	26	10	44	10	14
	CF	39	78	19	50/15	15	14/12	4	41/4	4	10/4
U.S.	CV	95	135	41	65	40	26	10	44	10	14
First	MD	56	126	24	27/38	21	3/23	7	22/22	7	3/11

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	- 8.4
Soviet	CV	- 49.0	- 1.2
First	MD	- 46.6	+ 4.8
	CF	- 88.1	.0
U.S.	CV	- 49.0	- 1.2
First	MD	- 83.6	- 6.7

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO [illegible]" FORCES

OPTION I

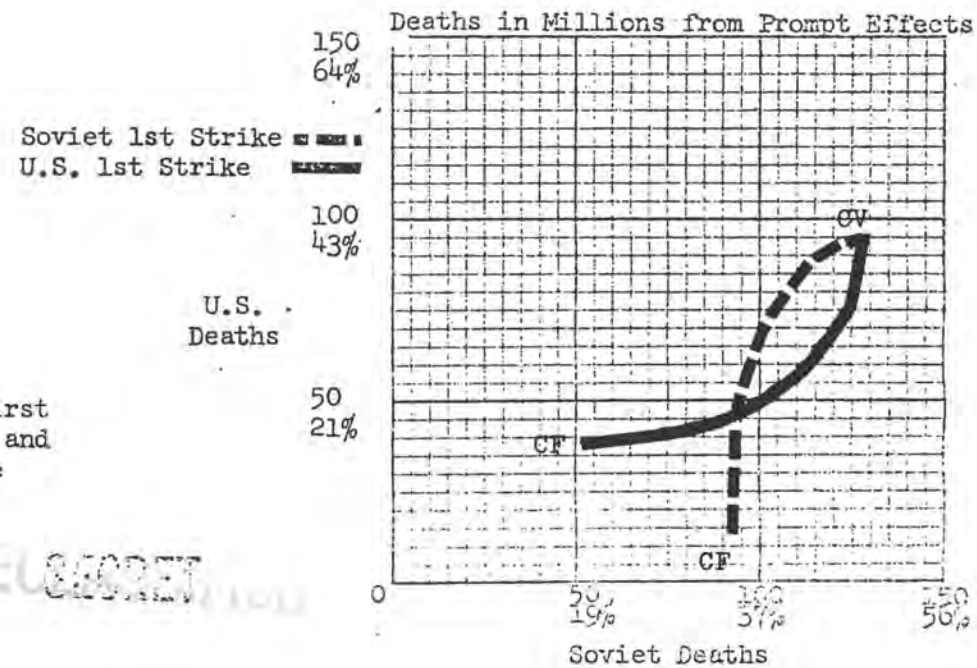
Baseline Forces with: 1000 Area ABM; 4000 Terminal ABM (Cities); GTE Soviet SAM Defense

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
Soviet First	CF	14	93								
	CV	95	128								
	MD	83	110								
U.S. First	CF	39	52								
	CV	95	128								
	MD	65	117								

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	- 33.6
	CV	- 49.0	- 8.0
	MD	- 58.8	- 19.8
U.S. First	CF	- 88.1	- 25.5
	CV	- 49.0	- 8.0
	MD	- 74.0	- 15.6

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

DECLASSIFIED

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

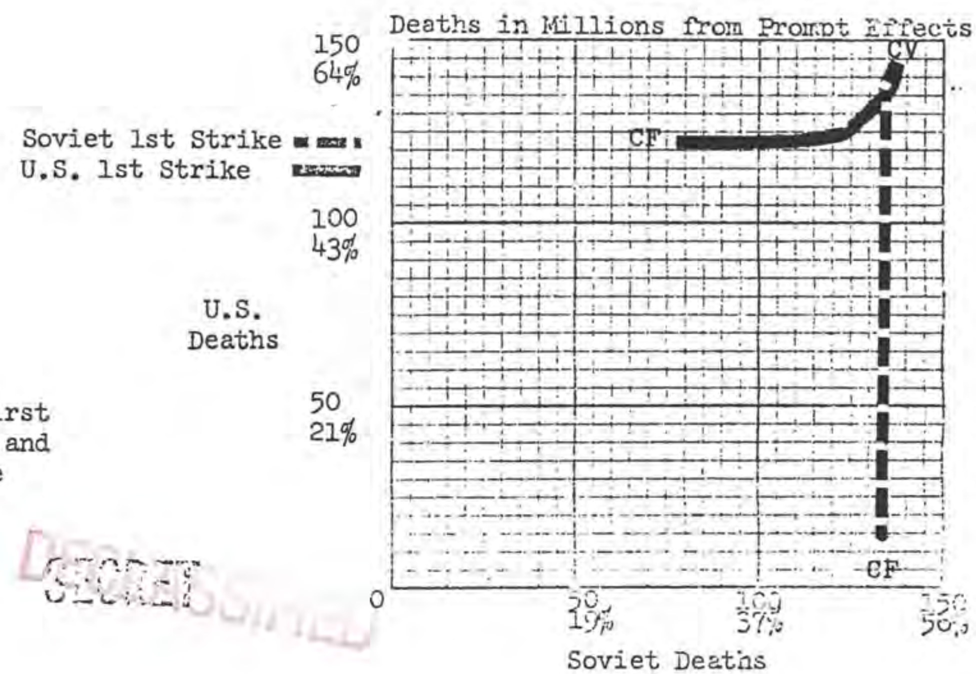
Baseline Forces with: 0 Area ABM; 0 Terminal ABM (Cities);
U.S. adds 192 SLBMs

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
	CF	14	133								
Soviet	CV	144	137								
First	MD	143	136								
	CF	122	78								
U.S.	CV	144	137								
First	MD	130	131								

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	+ 6.4
Soviet	CV	.0	+ .8
First	MD	+ 1.6	+ 5.6
	CF	- 4.9	.0
U.S.	CV	.0	+ .8
First	MD	- 9.5	- 1.6

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

SECRET

DECLASSIFIED

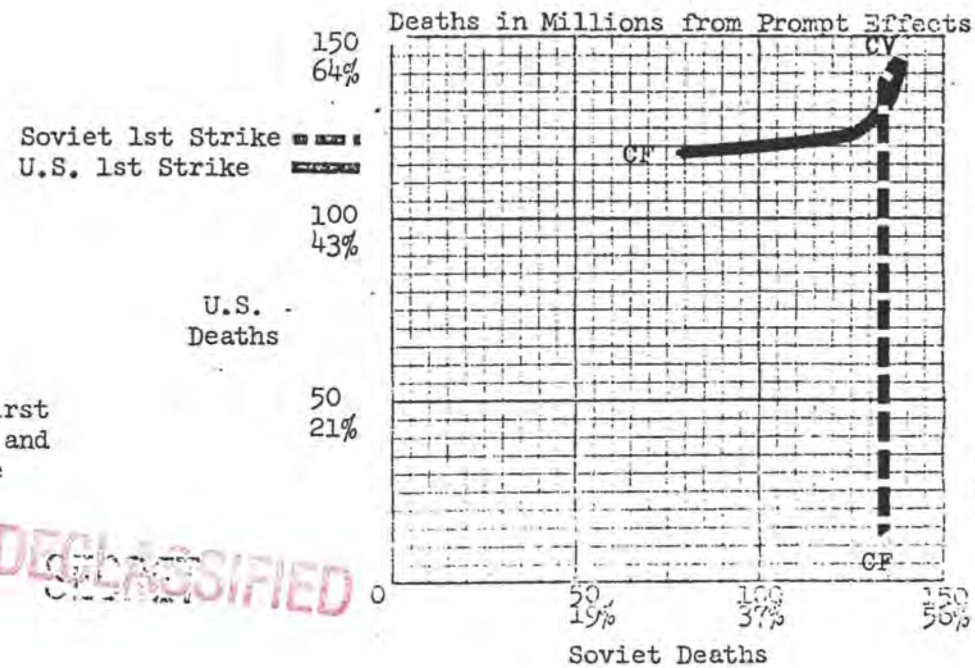
ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

Baseline Forces with: 200 Area ABM; 0 Terminal ABM (Cities);
U.S. adds 192 SLBMs

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Soviet First	CF	14	133								
	CV	144	137								
	MD	143	136								
U.S. First	CF	118	78								
	CV	144	137								
	MD	126	131								

War-fighting Curves



Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	+ 6.1
	CV	- .1	+ .8
	MD	+ 1.2	+ 5.5
U.S. First	CF	- 9.0	.0
	CV	- .1	+ .8
	MD	- 13.0	- 2.0

* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

AEM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

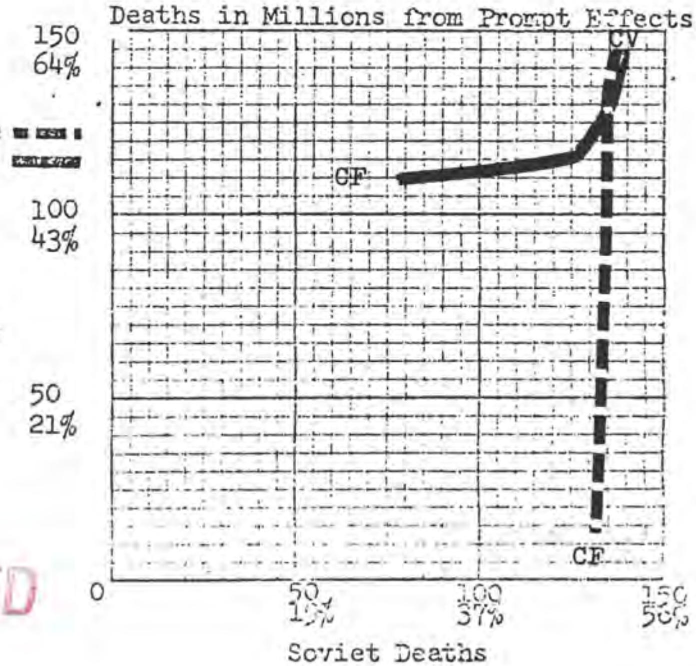
Baseline Forces with: 500 Area ABM; 0 Terminal ABM (Cities);
U.S. adds 192 SLBMs

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
	CF	14	132								
Soviet	CV	144	137								
First	MD	144	137								
	CF	110	78								
U.S.	CV	144	137								
First	MD	120	130								

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	+ 5.8
Soviet	CV	- .4	+ .7
First	MD	+ 2.0	+ 6.7
	CF	- 16.6	.0
U.S.	CV	- .4	+ .7
First	MD	- 19.1	- 2.5

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION 1

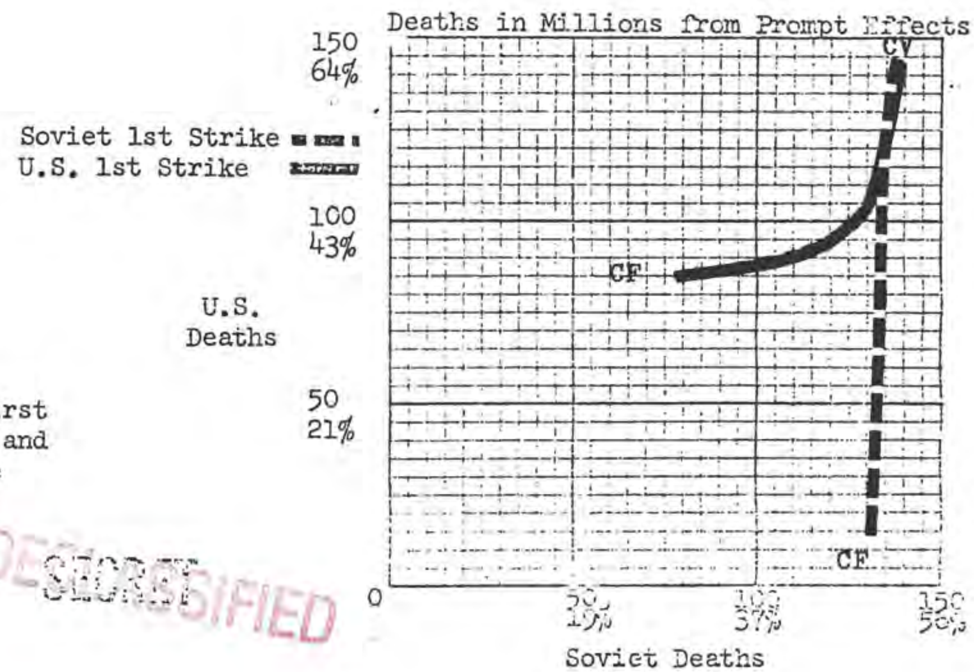
Baseline Forces with: 500 Area ABM; 1000 Terminal ABM (Cities); U.S. adds 192 SLBMs

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
	CF	14	131								
Soviet	CV	143	137								
First	MD	143	137								
	CF	85	78								
U.S.	CV	143	137								
First	MD	100	129								

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	+ 4.0
Soviet	CV	- 1.7	+ .6
First	MD	+ .7	+ 6.6
	CF	- 42.1	.0
U.S.	CV	- 1.7	+ .6
First	MD	- 39.8	- 3.9

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

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ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

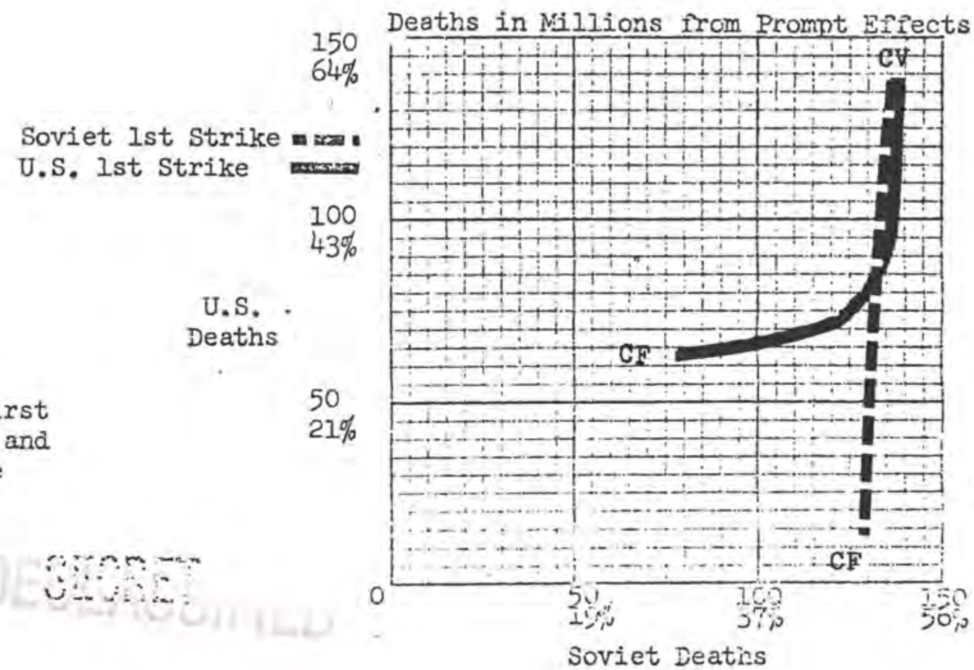
Baseline Forces with: 500 Area ABM; 2000 Terminal ABM (Cities); U.S. adds 192 SLBMs

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
Soviet First	CF	14	129								
	CV	137	137								
	MD	137	137								
U.S. First	CF	63	78								
	CV	137	137								
	MD	128	128								

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	+ 2.4
	CV	- 7.3	+ .5
	MD	- 4.9	+ 6.5
U.S. First	CF	- 63.8	.0
	CV	- 7.3	+ .5
	MD	- 63.3	- 4.3

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

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ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION I

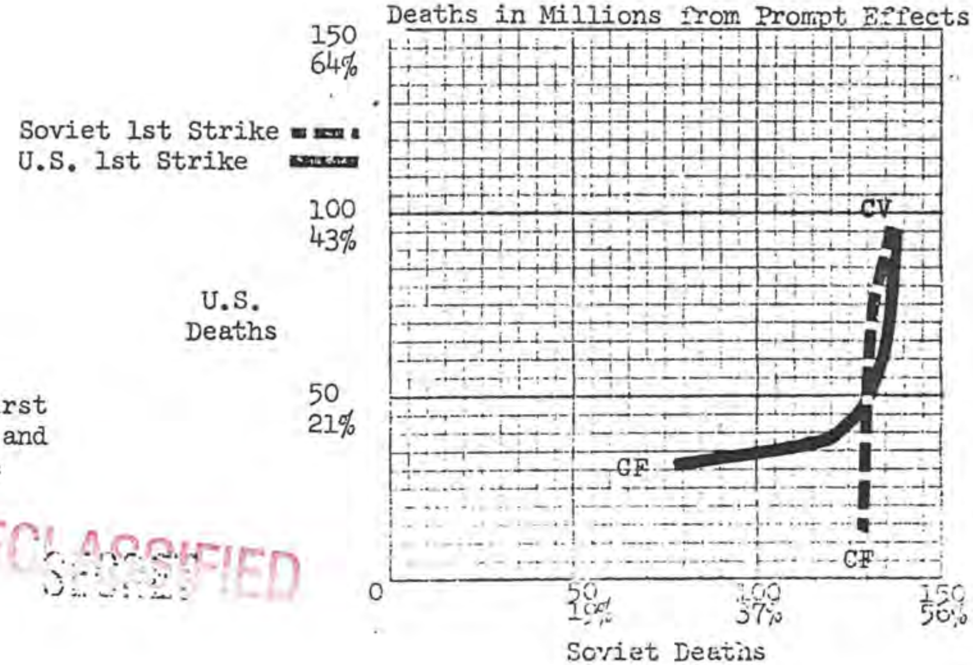
Baseline Forces with: 1000 Area ABM; 4000 Terminal ABM (Cities);
U.S. adds 192 SLBMs

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
Soviet First	CF	14	128								
	CV	95	136								
	MD	95	136								
U.S. First	CF	32	78								
	CV	95	136								
	MD	44	128								

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	+ 1.2
	CV	- 49.0	+ .3
	MD	- 46.6	+ 6.3
U.S. First	CF	- 94.5	.0
	CV	- 49.0	+ .3
	MD	- 95.3	- 5.2

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

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ABM WAR-FIGHTING CALCULATIONS - "TWO YEAR" FORCES

OPTION II

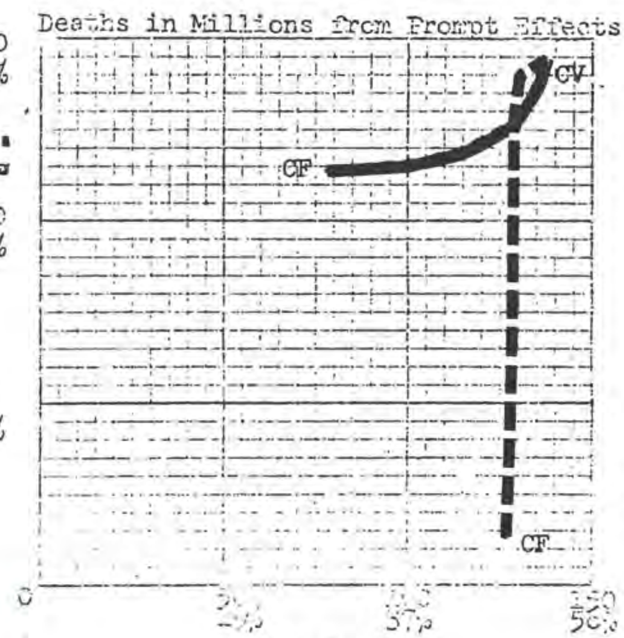
Baseline Forces with: 0 Area ABM; 0 Terminal ABM (Cities);

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
	CF	14	127	32/.4	49	33/.9	17	26/.1	37	27/.2	10
Soviet	CV	144	136	33	65	34	26	26	50	27	17
First	MD	140	132	10/23	53	11/23	19	8/18	40	9/18	11
	CF	114	78	12	50/15	10	14/12	10	44/4	8	11/4
U.S.	CV	144	136	33	65	34	26	26	50	27	17
First	MD	128	130	16	31/34	14	4/22	13	27/23	11	3/14

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF		
Soviet	CV	This is the Baseline Case for Option II.	
First	MD		
	CF		
U.S.	CV		
First	MD		

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

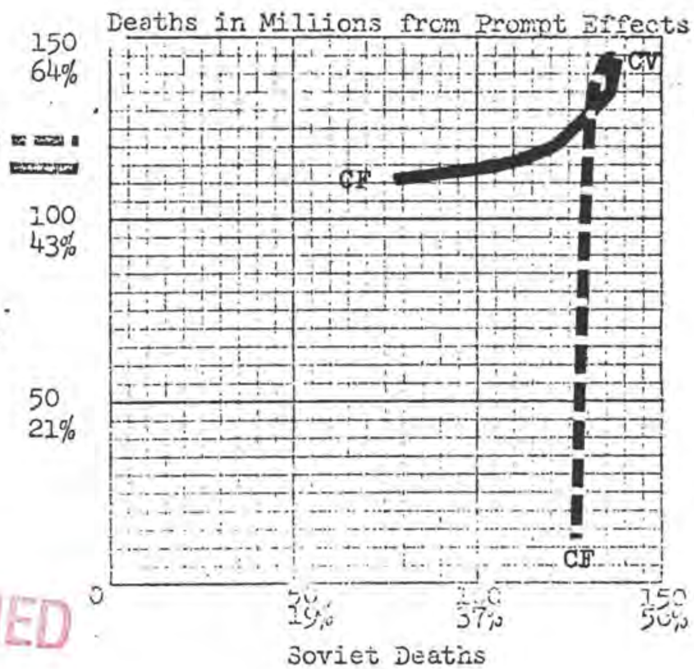
Baseline Forces with: 0 Area ABM; 0 Terminal ABM (Cities);

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Soviet First	CF	14	126	37/.4	49	37/.9	17	30/.1	36	30/.2	9
	CV	144	136	37	65	38	26	30	50	30	17
	MD	142	130	11/26	52	13/25	18	10/20	39	11/19	11
U.S. First	CF	111	78	11	50/15	9	14/12	9	44/4	7	11/4
	CV	144	136	37	65	38	26	30	50	30	17
	MD	124	130	14	30/35	13	4/22	12	27/23	10	3/14

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF		
	CV		
	MD	This is the Baseline case for Option III.	
U.S. First	CF		
	CV		
	MD		

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

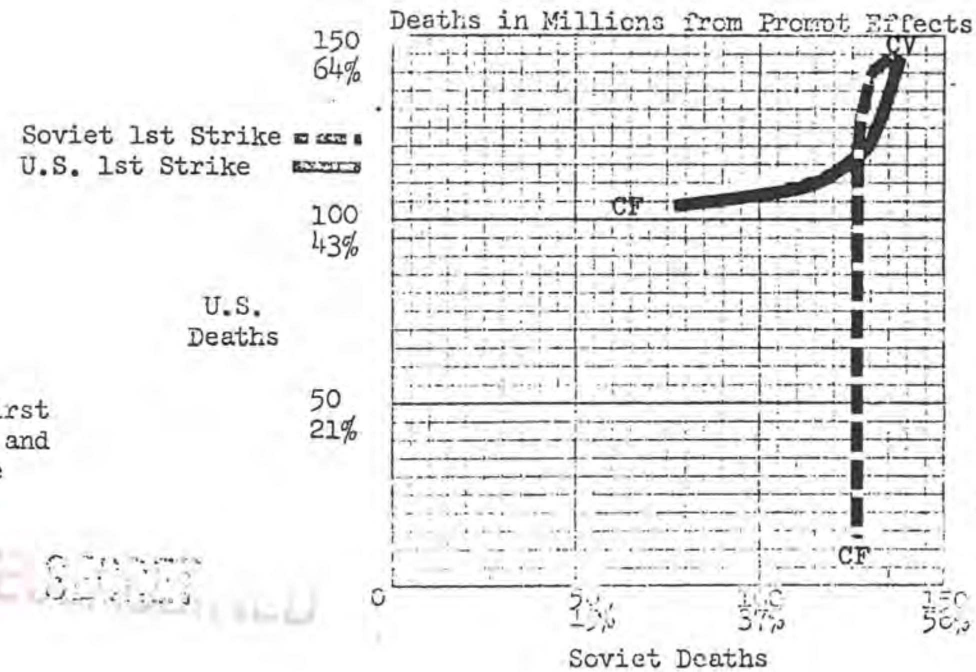
Baseline Forces with: 200 Area ABM; 0 Terminal ABM (Cities);

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
	CF	14	126	37/.4	49	37/.9	17	28/.1	35	28/.2	9
Soviet	CV	144	136	37	65	38	26	28	50	29	17
First	MD	141	131	11/26	53	12/26	19	9/19	39	10/19	11
	CF	105	78	11	50/15	9	14/12	7	44/4	6	11/4
U.S.	CV	144	136	37	65	38	26	28	50	29	17
First	MD	117	128	14	34/31	12	4/22	10	29/21	8	3/14

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	- .8
Soviet	CV	- .2	- .1
First	MD	- .8	+ .3
	CF	- 6.5	.0
U.S.	CV	- .2	- .1
First	MD	- 7.5	- 2.3

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

Baseline Forces with: 500 Area ABM; 0 Terminal ABM (Cities);

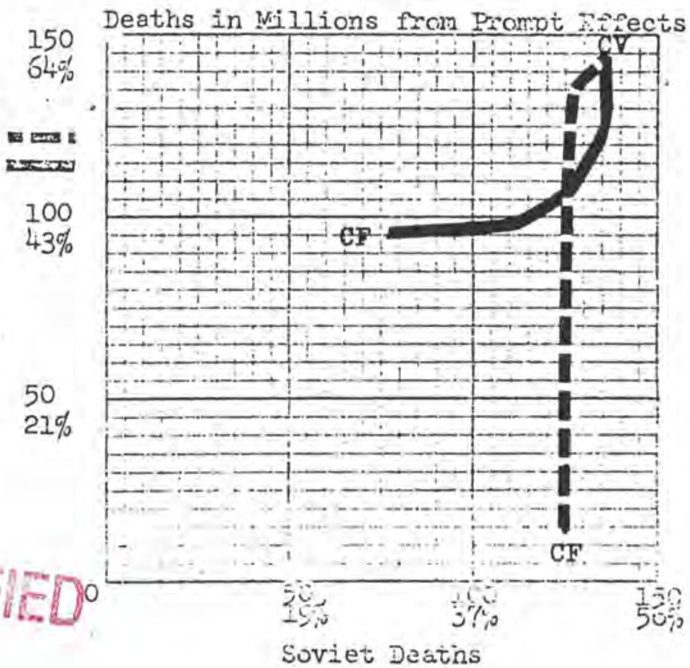
		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Soviet First	CF	14	125	37/.4	49	37/.9	17	26/.1	34	26/.2	9
	CV	144	136	37	65	38	26	26	49	26	17
	MD	140	132	10/27	54	11/27	20	8/18	39	8/18	11
U.S. First	CF	95	78	11	50/15	9	14/12	5	43/4	4	11/4
	CV	144	136	37	65	38	26	26	49	26	17
	MD	107	127	14	34/31	12	4/22	7	28/21	6	4/13

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	- 1.7
	CV	- .6	- .3
	MD	- 2.1	+ 1.2
U.S. First	CF	- 16.8	.0
	CV	- .6	- .3
	MD	- 17.2	- 3.3

War-fighting Curves

Soviet 1st Strike
U.S. 1st Strike



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

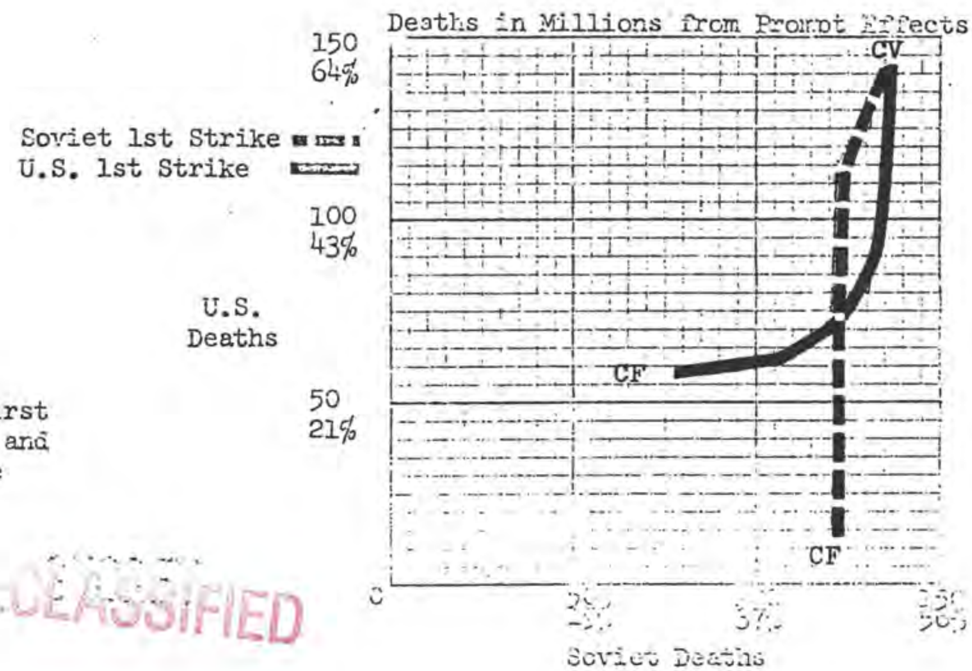
ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

Baseline Forces with: 500 Area ABM; 1000 Terminal ABM (Cities);

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
	CF	14	122	37/.4	49	37/.9	17	26/.1	30	26/.2	8
Soviet	CV	142	136	37	65	38	26	18	47	19	16
First	MD	142	136	37	65	38	26	18	47	19	16
	CF	58	78	11	50/15	9	14/12	3	42/4	3	11/4
U.S.	CV	142	136	37	65	38	26	18	47	19	16
First	MD	75	125	14	32/33	13	4/22	4	27/21	4	4/12

War-fighting Curves



		Change to Baseline Case:	
		U.S. Deaths	Soviet Deaths
	CF	.0	- 4.2
Soviet	CV	- 2.6	- .5
First	MD	- .2	+ 5.3
	CF	- 53.2	.0
U.S.	CV	- 2.6	- .5
First	MD	- 49.7	- 4.8

* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

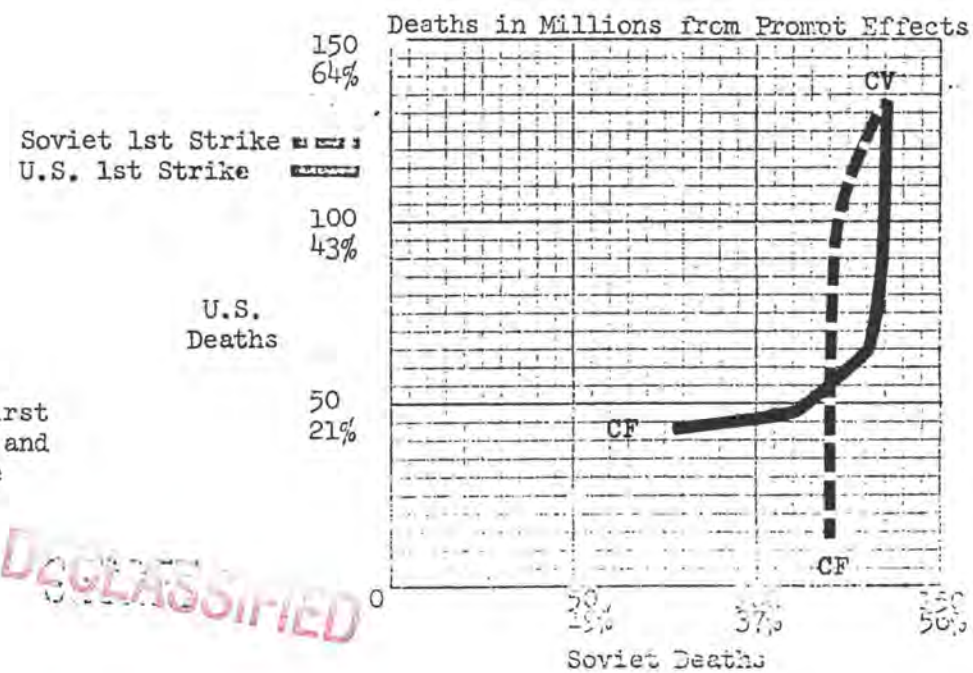
Baseline Forces with: 500 Area ABM; 2000 Terminal ABM (Cities);

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Soviet First	CF	14	120	37/.4	49	37/.9	17	26/.1	28	26/.2	8
	CV	132	135	37	65	38	26	12	46	13	15
	MD	132	135	37	65	38	26	12	46	13	15
U.S. First	CF	44	78	11	50/15	9	14/12	3	42/4	3	11/4
	CV	132	135	37	65	38	26	12	46	13	15
	MD	62	128	15	27/38	14	3/23	6	22/24	6	3/12

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	- 6.5
	CV	- 11.9	- .7
	MD	- 9.5	+ 5.1
U.S. First	CF	- 67.3	.0
	CV	- 11.9	- .7
	MD	- 62.5	- 2.0

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

AEM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

Baseline Forces with: 1000 Area AEM; 4000 Terminal ABM (Cities);

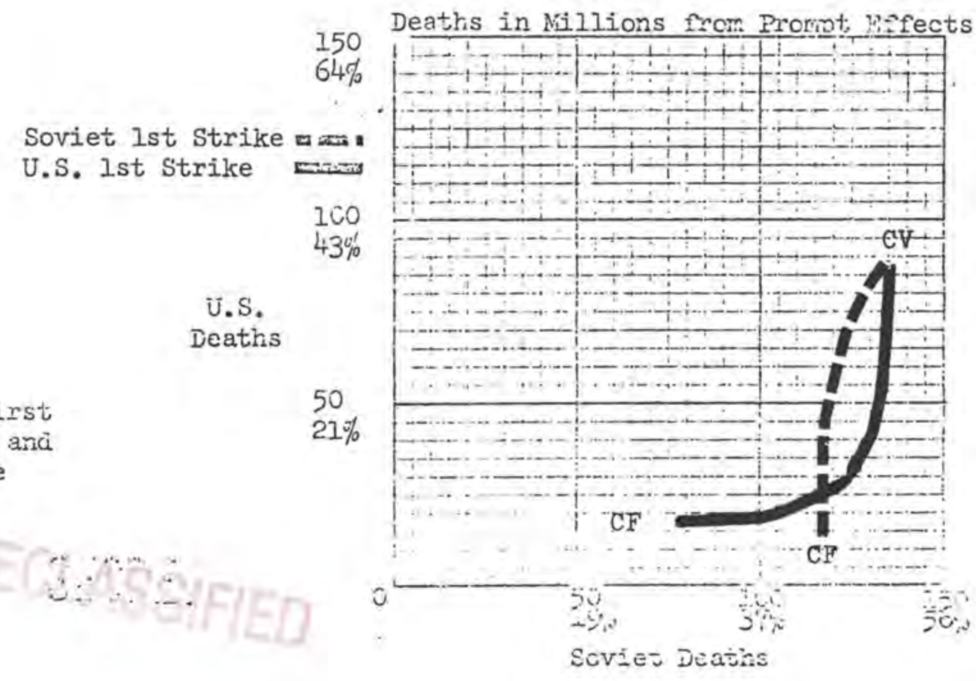
		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
	CF	14	118	37/.4	51	37/.9	18	21/.1	26	22/.2	7
Soviet	CV	88	135	37	65	38	26	9	44	10	14
First	MD	88	135	37	65	38	26	9	44	10	14
	CF	18	78	12	50/15	9	14/12	1	41/4	1	10/4
U.S.	CV	88	135	37	65	38	26	9	44	10	14
First	MD	32	127	16	26/39	14	3/23	4	21/23	4	3/12

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	- 8.7
Soviet	CV	- 56.6	- 1.2
First	MD	- 54.2	+ 4.6
	CF	- 93.4	.0
U.S.	CV	- 56.6	- 1.2
First	MD	- 92.2	- 3.4

* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

War-fighting Curves



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ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

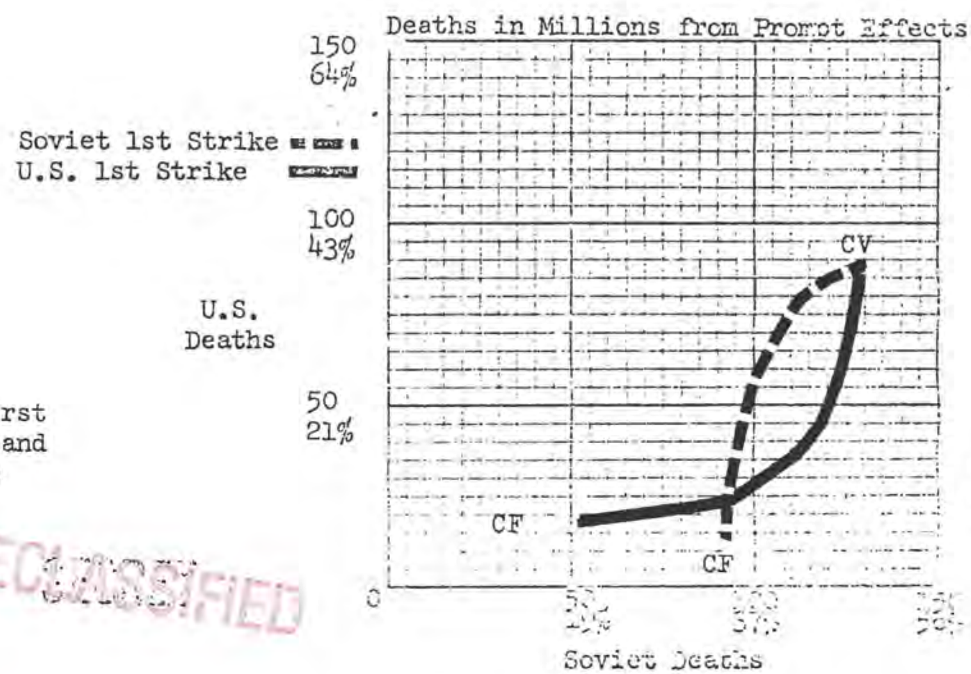
OPTION III

Baseline Forces with: 1000 Area ABM; 4000 Terminal ABM (Cities); GTE Soviet SAM Defense

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
	CF	14	93								
Soviet	CV	88	128								
First	MD	76	111								
	CF	18	52								
U.S.	CV	88	128								
First	MD	43	117								

War-fighting Curves

		Change to Baseline Case: U.S. Deaths	Soviet Deaths
	CF	.0	- 33.9
Soviet	CV	- 56.6	- 8.0
First	MD	- 66.0	- 19.3
	CF	- 93.4	- 25.5
U.S.	CV	- 56.6	- 8.0
First	MD	- 81.5	- 13.2



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

Baseline Forces with: 0 Area ABM; 0 Terminal ABM (Cities); **500 Terminal ABM (weapons)**;

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
	CF	14	127	37/.4	49	37/.9	17	26/.1	37	26/.2	10
Soviet	CV	144	136	37	65	38	26	30	50	30	17
First	MD	142	133	11/26	56	12/26	20	7/20	42	8/20	11
	CF	113	78	11	50/15	9	14/12	9	41/4	7	11/4
U.S.	CV	144	136	37	65	38	26	30	50	30	17
First	MD	127	130	15	30/35	13	4/22	13	23/24	11	3/14

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	+ .4
Soviet	CV	.0	.0
First	MD	.0	+ 2.5
	CF	+ 1.5	.0
U.S.	CV	.0	.0
First	MD	+ 2.2	- .3

* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

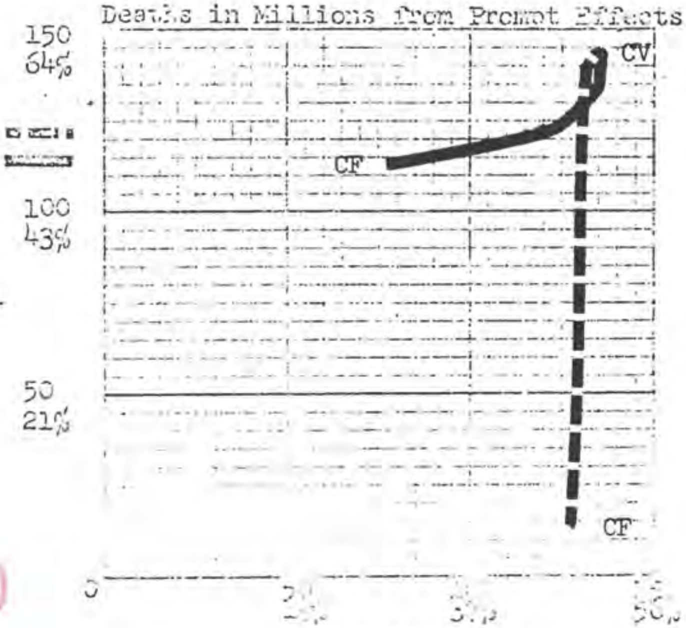
War-fighting Curves

Deaths in Millions from Prompt Effects

Soviet 1st Strike

U.S. 1st Strike

U.S. Deaths



ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

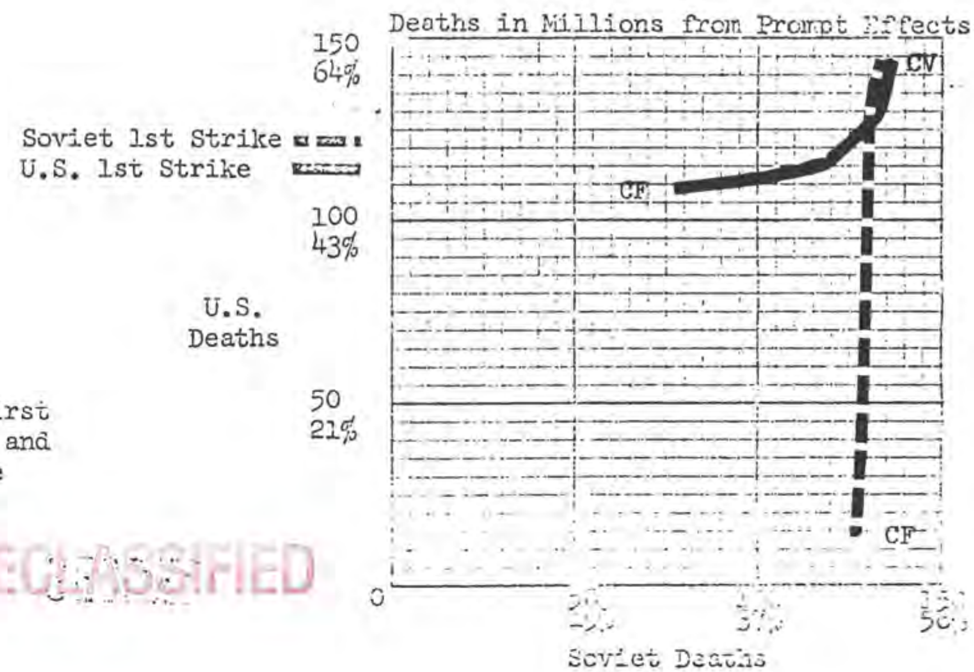
Baseline Forces with: 200 Area ABM; 0 Terminal ABM (Cities); 800 Terminal ABM (weapons);

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
Soviet First	CF	14	127	37/.4	50	37/.9	18	21/.1	36	21/.2	10
	CV	144	136	37	65	38	26	28	50	29	17
	MD	143	135	5/32	62	6/32	22	4/24	46	5/24	13
U.S. First	CF	108	78	12	50/15	10	14/12	8	36/4	6	10/4
	CV	144	136	37	65	38	26	28	50	29	17
	MD	122	127	15	33/22	14	5/21	11	22/22	10	4/12

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	+ .6
	CV	- .2	- .1
	MD	+ 1.5	+ 4.7
U.S. First	CF	- 3.0	.0
	CV	- .2	- .1
	MD	- 2.4	- 3.0

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

Baseline Forces with: 500 Area ABM; 0 Terminal ABM (Cities); 2000 **Terminal ABM (Weapons)**;

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
	CF	14	131	37/.4	55	37/.9	19	15/.1	40	15/.2	11
Soviet	CV	144	136	37	65	38	26	26	49	26	17
First	MD	144	136	13/37	65	13/38	25	.2/25	49	.2/26	16
	CF	103	78	13	50/15	11	14/12	6	31/4	5	8/4
U.S.	CV	144	136	37	65	38	26	26	49	26	17
First	MD	117	129	16	29/36	15	5/20	9	19/25	8	3/13

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	+ 4.4
Soviet	CV	- .6	- .3
First	MD	+ 1.8	+ 5.4
	CF	- 8.1	.0
U.S.	CV	- .6	- .3
First	MD	- 7.5	- 1.4

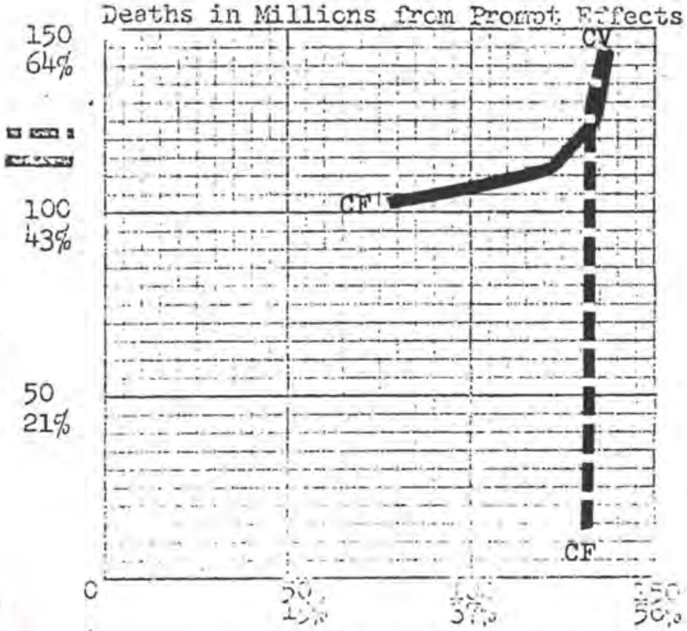
War-fighting Curves

Deaths in Millions from Prompt Effects

Soviet 1st Strike

U.S. 1st Strike

U.S. Deaths



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

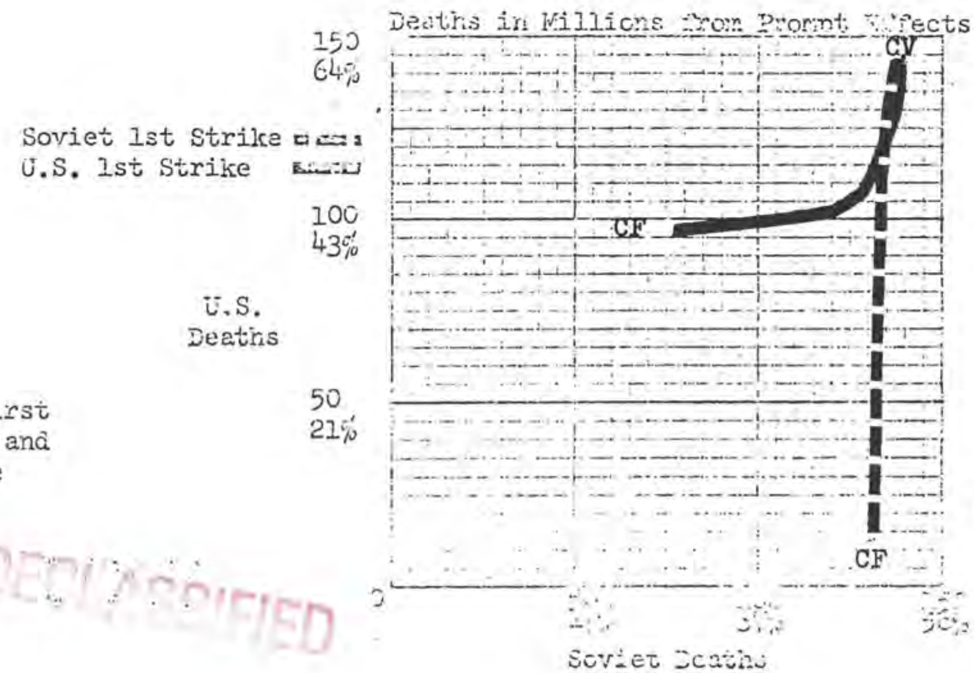
Baseline Forces with: 500 Area ABM; 0 Terminal ABM (Cities);
192 ICBMs exchanged for 192 SLBMs on each side.

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
	CF	14	132	34/.4	68	32/.9	19	23/.1	49	22/.2	11
Soviet	CV	143	137	34	81	33	26	23	63	22	17
First	MD	143	137	34	81	33	26	23	63	22	17
	CF	98	78	13	66/15	9	14/12	6	57/4	4	11/4
U.S.	CV	143	137	34	81	33	26	23	63	22	17
First	MD	106	129	15	45/36	12	5/21	8	38/25	6	4/13

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	+ 5.5
Soviet	CV	- 1.7	+ .5
First	MD	+ .7	+ 6.3
	CF	- 13.6	.0
U.S.	CV	- 1.7	+ .5
First	MD	- 18.1	- .9

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

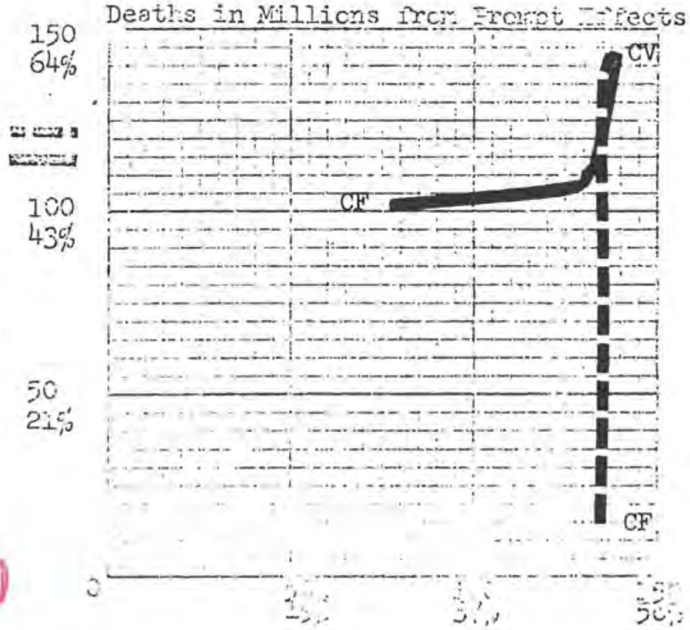
Baseline Forces with: 500 Area ABM; 0 Terminal ABM (Cities);
384 ICBM exchanged for 384 SLBM on each side

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
Soviet First	CF	14	135	36/.4	85	32/.9	21	25/.1	64	22/.2	12
	CV	142	137	36	98	33	26	25	77	22	17
	MD	142	137	36	98	33	26	25	77	22	17
U.S. First	CF	101	78	16	83/15	10	14/12	8	71/4	5	11/4
	CV	142	137	36	98	33	26	25	77	22	17
	MD	108	132	18	47/51	12	5/21	10	39/38	7	5/12

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	+ 8.3
	CV	- 1.8	+ .7
	MD	+ .6	+ 6.5
U.S. First	CF	- 10.3	.0
	CV	- 1.8	+ .7
	MD	- 16.2	+ 2.3

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

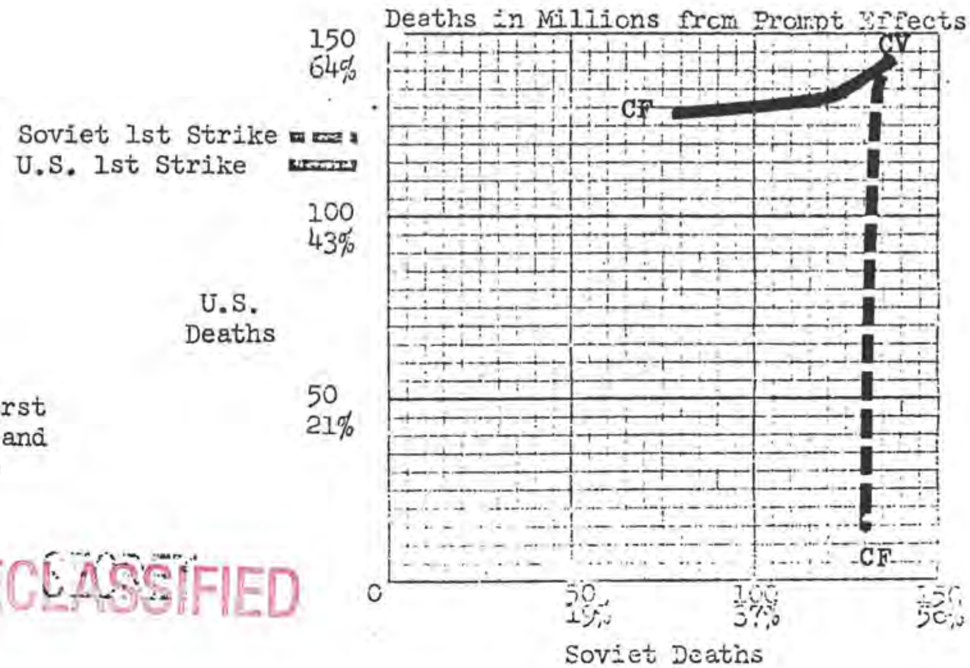
OPTION III

Baseline Forces with: 500 Area ABM; 0 Terminal ABM (Cities);
Each side has about 500 Hard Rock Silos (3000 psi)

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
Soviet First	CF	14	130								
	CV	144	136								
	MD	144	136								
U.S. First	CF	129	78								
	CV	144	136								
	MD	143	135								

		Change to Baseline Case: U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	+3.5
	CV	- .6	- .3
	MD	+ 1.8	+5.5
U.S. First	CF	+17.4	.0
	CV	- .6	- .3
	MD	+18.3	+5.2

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

SECRET

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

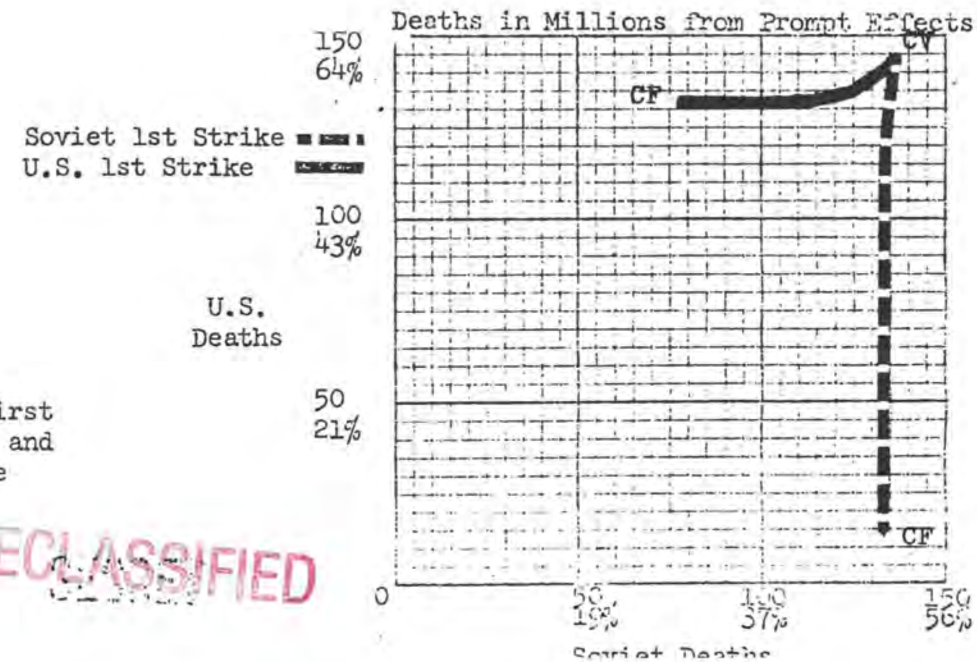
Baseline Forces with: 500 Area ABM; 0 Terminal ABM (Cities); 1000 Terminal ABM (Weapons); Each side has about 500 HRS, Terminal ABM defends other silos.

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
Soviet First	CF	14	133								
	CV	144	136								
	MD	144	136								
U.S. First	CF	131	78								
	CV	144	136								
	MD	143	135								

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	+6.3
	CV	- .6	- .3
	MD	+ 1.8	+5.5
U.S. First	CF	+19.8	.0
	CV	- .6	- .3
	MD	+18.3	+5.2

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

SECRET

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION III

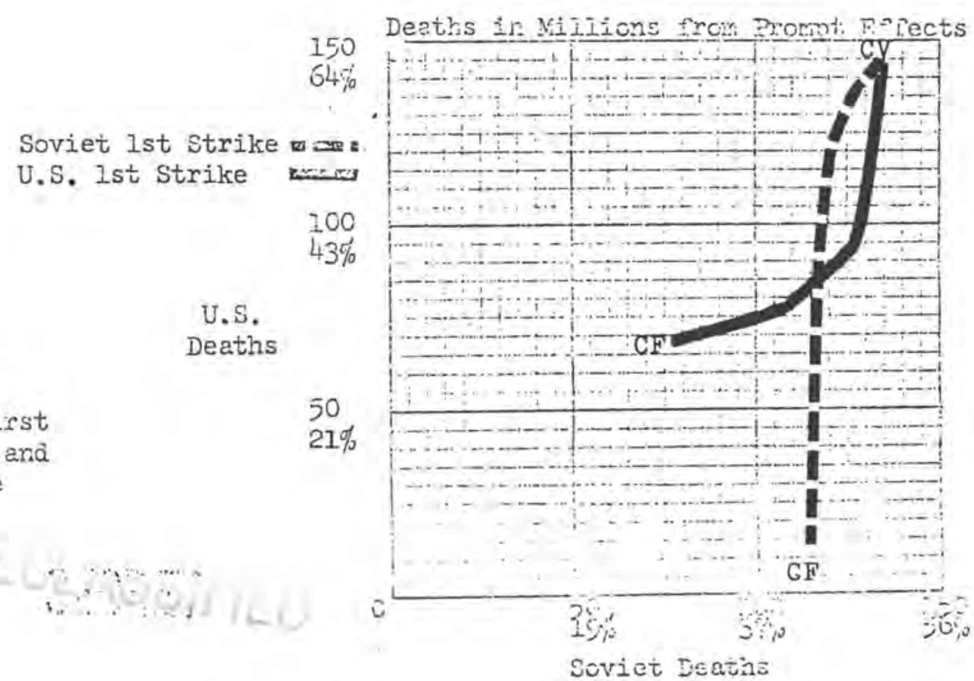
Baseline Forces with: 0 Area ABM; 1000 Terminal ABM (Cities); 528 SABMIS

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Soviet First	CF	14	114	37/.4	49	37/.9	17	26/.1	23	27/.2	7
	CV	142	134	37	65	38	26	18	39	20	15
	MD	141	132	3/34	60	3/35	24	2/16	35	2/18	14
U.S. First	CF	68	78	12	50/15	10	14/12	3	34/4	3	10/4
	CV	142	134	37	65	38	26	18	39	20	15
	MD	89	124	16	32/33	15	5/21	4	20/20	4	3/12

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	- 12.3
	CV	- 2.2	- 2.6
	MD	- 1.1	+ 1.4
U.S. First	CF	- 43.7	.0
	CV	- 2.2	- 2.6
	MD	- 35.2	- 6.1

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION IV

Baseline Forces with: 0 Area ABM; 0 Terminal ABM (Cities);

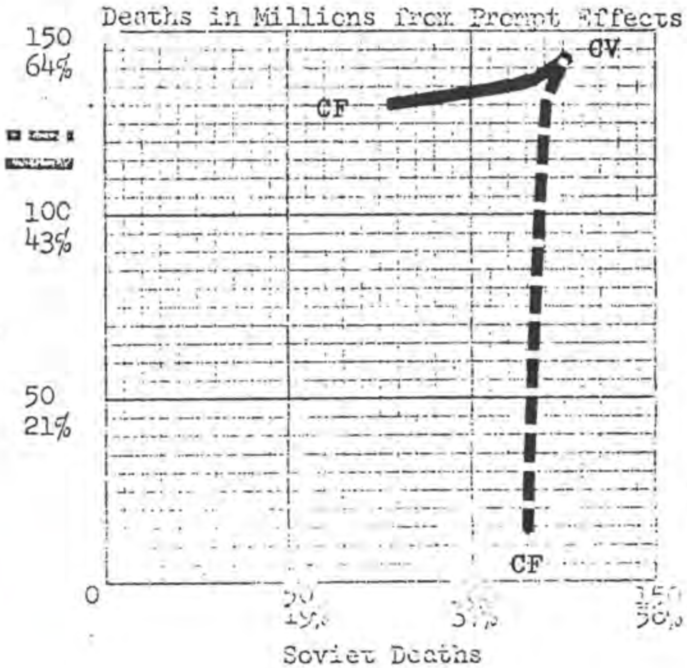
		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Soviet First	CF	14	115	15/.4	20	35/.9	18	13/.1	11	28/.2	11
	CV	143	126	15	27	36	27	13	18	29	18
	MD	141	124	3/12	26	3/33	24	2/11	16	3/26	16
U.S. First	CF	130	78	11	12/15	14	15/12	9	12/4	12	12/4
	CV	143	126	15	27	36	27	13	18	29	18
	MD	136	118	12	6/21	17	7/20	10	6/12	46	6/12

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF		
	CV		
	MD	This is the Baseline case for Option IV.	
U.S. First	CF		
	CV		
	MD		

War-fighting Curves

Soviet 1st Strike
U.S. 1st Strike



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

AEM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION IV

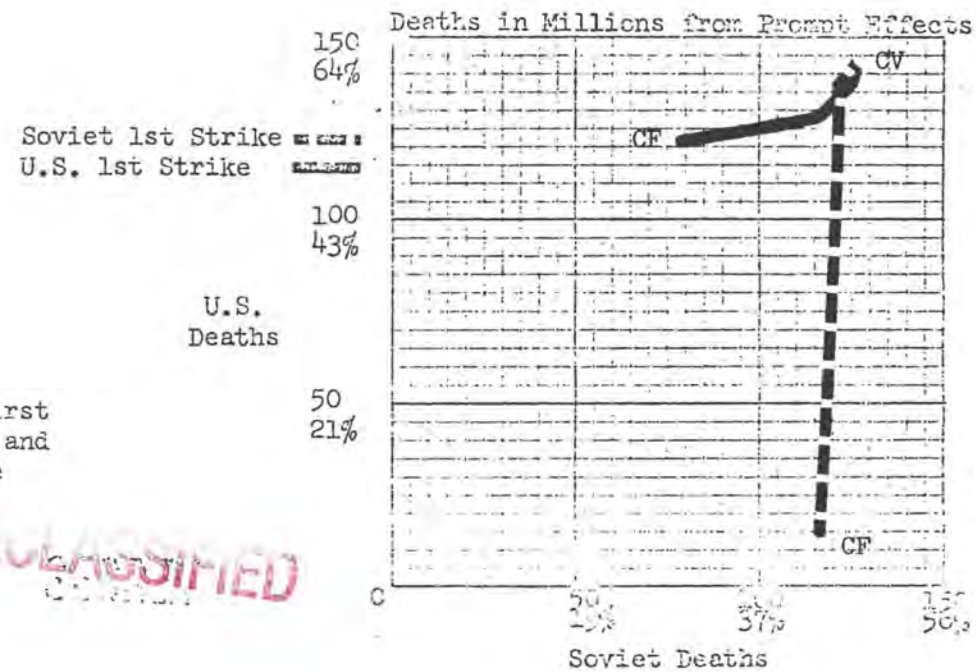
Baseline Forces with: 200 Area ABM; 0 Terminal ABM (Cities);

		Deaths (10^6) U.S.	Deaths (10^6) Soviet	Attacking RVS (10^2)* U.S.	Attacking RVS (10^2)* Soviet	Attacking EMT (10^2)* U.S.	Attacking EMT (10^2)* Soviet	Detonating RVS (10^2)* U.S.	Detonating RVS (10^2)* Soviet	Detonating EMT (10^2)* U.S.	Detonating EMT (10^2)* Soviet
	CF	14	116	15/.4	21	35/.9	19	11/.1	12	25/.2	11
Soviet	CV	141	125	15	27	36	27	11	18	25	18
First	MD	140	125	.3/15	27	.3/36	26	.2/11	18	.2/25	18
	CF	122	78	10	12/15	15	15/12	7	12/4	9	12/4
U.S.	CV	141	125	15	37	36	27	11	18	25	18
First	MD	128	116	12	7/20	17	8/19	9	6/12	11	7/11

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	+ .9
Soviet	CV	- 2.2	- .5
First	MD	- .7	+ .8
	CF	- 8.0	0
U.S.	CV	- 2.2	- .5
First	MD	- 7.8	- 2.1

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION IV

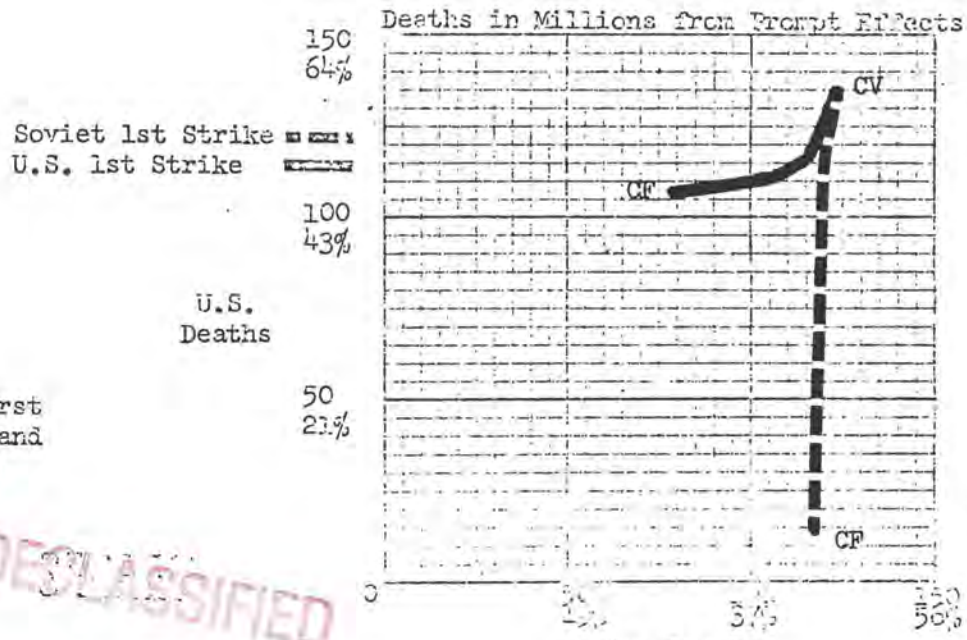
Baseline Forces with: 500 Area ABM; 0 Terminal ABM (Cities);

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
	CF	14	118	15/.4	22	35/.9	21	8/.1	13	19/.2	13
Soviet	CV	135	124	15	27	36	27	8	18	19	18
First	MD	135	124	15	27	36	27	8	18	19	18
	CF	107	78	10	12/15	15	15/12	4	12/4	6	12/4
U.S.	CV	135	124	15	27	36	27	8	18	19	18
First	MD	116	116	12	7/20	17	8/19	6	6/12	8	7/11

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	+ 2.6
Soviet	CV	- 8.3	- 1.3
First	MD	- 6.5	+ .8
	CF	- 22.8	.0
U.S.	CV	- 8.3	- 1.3
First	MD	- 20.4	- 2.7

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION IV

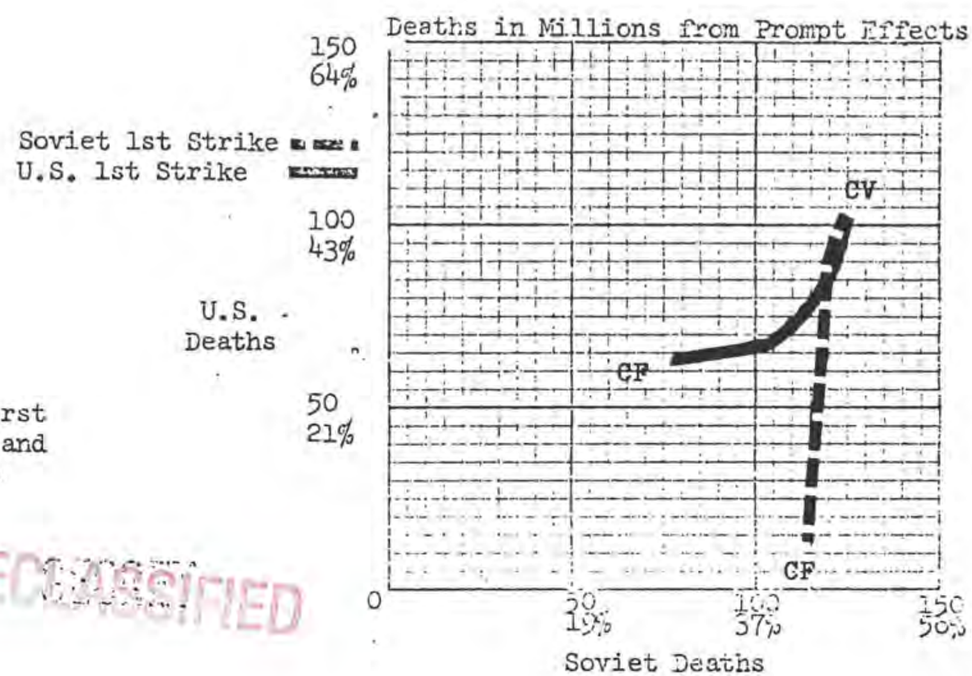
Baseline Forces with: 500 Area ABM; 1000 Terminal ABM (Cities);

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
	CF	14	115	15/.4	27	35/.9	21	8/.1	12	19/.2	11
Soviet	CV	101	123	15	27	36	27	3	16	13	16
First	MD	101	123	15	27	36	27	3	16	13	16
	CF	63	78	10	12/15	17	15/12	2	11/14	4	12/4
U.S.	CV	101	123	15	27	36	27	3	16	13	16
First	MD	72	111	11	8/19	19	8/19	2	7/9	5	7/9

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
	CF	.0	- .3
Soviet	CV	- 41.8	- 3.2
First	MD	- 40.0	- 1.1
	CF	- 66.6	.0
U.S.	CV	- 41.8	- 3.2
First	MD	- 64.2	- 7.4

War-fighting Curves



* If two figures appear in a column, the first represents RVS or EMT for weapon targets and the second for city targets. If only one figure appears, it is for city targets.

ABM WAR-FIGHTING CALCULATIONS - "NO YEAR" FORCES

OPTION IV

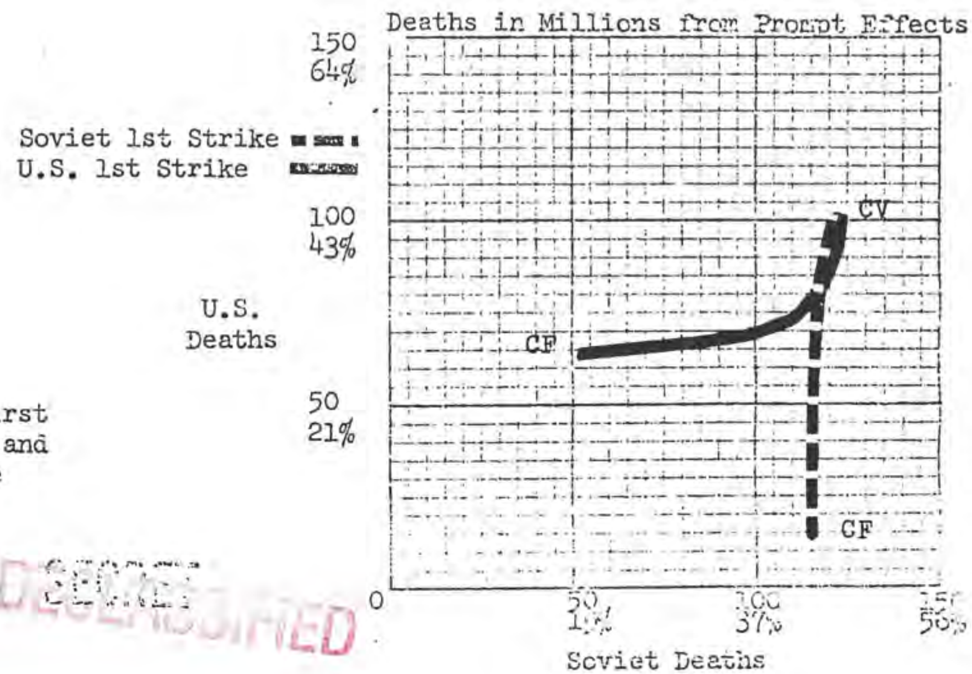
Baseline Forces with: 500 Area ABM; 1000 Terminal ABM (Cities); GTE Soviet SAM Defense

		Deaths (10^6)		Attacking RVS (10^2)*		Attacking EMT (10^2)*		Detonating RVS (10^2)*		Detonating EMT (10^2)*	
		U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet	U.S.	Soviet
Soviet First	CF	14	115								
	CV	101	122								
	MD	101	122								
U.S. First	CF	63	52								
	CV	101	122								
	MD	73	111								

Change to Baseline Case:

		U.S. Deaths	Soviet Deaths
Soviet First	CF	.0	- .7
	CV	-41.8	-3.3
	MD	-40.0	-1.2
U.S. First	CF	-66.6	-25.5
	CV	-41.8	- 3.3
	MD	-63.1	- 7.1

War-fighting Curves



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TAB H

ANALYSIS OF FORCE CAPABILITIES

CONSIDERING MILITARY TARGETING

TABLE OF CONTENTS

TAB H

ANALYSIS OF FORCE CAPABILITIES CONSIDERING MILITARY TARGETING

1. The following graphs summarize the results of analysis designed to examine relative force effectiveness of US and Soviet strategic missile forces using scenarios in which both the initiator and retaliator optimize their attacks to inflict both military and urban damage. In each strike the attacker determines the minimum number of its missiles needed to cause a preselected percentage of fatalities and uses the remainder to cause maximum military damage. If availability of weapons precludes attaining the preselected fatalities, military targets are not attacked and fatalities are maximized. The preselected percentage of fatalities to be achieved by missiles was arbitrarily set at 25 percent. In an actual attack, of course, bomber forces would be used by both sides. In that case, the magnitude of fatalities and military damage achievable would be increased over that shown in the graphs, but the magnitude of those increases would be dependent upon the assumptions made concerning the size and effectiveness of bomber and air defense forces for each side.

2. The computer model used in this analysis was the Strategic Military Interactions Program for Evaluating Targeting (SMIPET), which has been developed by the Office of the

Assistant to the Chairman, Joint Chiefs of Staff, for Strategic Arms Negotiations (ACSAN). As in Code 50 and the AEM, the model utilizes Everett's method of generalized Lagrange Multipliers to find a weapon allocation which maximizes the total value destroyed. The measure of value for urban/industrial targets is population and remains fixed during all iterations to determine an optimized allocation achieving 25 percent fatalities. Relative values for military time-urgent nuclear threat targets are determined by the same mathematical formula used in the Code 50 model. Relative values for military targets not posing an immediate threat to each side's major cities are assigned as arbitrary fractions of the threat targets. In this analysis Soviet IRBM/MRBM sites were assigned a value approximately equal to the value of an SSZ9 silo; bomber bases were given half that value; and all other Soviet military targets were assigned one-fourth the value of an SSZ9. Similarly, US submarine bases, bomber bases, and other military targets were assigned respective relative values of three-fourths, one-half, and one-fourth of the value of a MINUTEMAN II silo. Relative values of military targets with respect to each other remain fixed during iterations. In each iteration the value of the entire set of military targets is adjusted with respect to the fixed total value of population targets. Then a set of weapon/target allocations is determined so as to maximize the total value destroyed, using the currently adjusted military values. The iterative process is continued until the maximum total value destroyed either includes the proper percent of fatalities or excludes all military values without achieving the proper fatalities.

3. Military targets used in these scenarious include for each side a variable number of time-urgent nuclear threat targets, as determined by the strategic weapons being used in the scenario, plus a fixed number of other military targets. These fixed other military targets consisted of 388 IR/MRBMs and 770 mixed targets in the Soviet Union and 655 mixed targets in the United States. The mixed targets were added so as to represent such things as command and control, communications, defense suppression, and nuclear storage targets from estimated 1978 data.

4. In all scenarios the forces of both sides are assumed to be in a generated alert status. The composition and characteristics of the forces are listed in Tabs B and D, except as specifically indicated for each case.

a. The mixed land/sea offensive forces used in Figures 2-A and 2-B are summarized below. Appropriate at-sea rates were applied to all SLBM forces:

(1) Both Sides Large Land Force - Base Case, see Tabs B and D.

(2) Both Sides Large Sea Force - Soviets replace 592, SSZ ICBMs with SSNZ1 SLBMs, and US replaces 384 MMII ICBMs with ULM SLBMs.

(3) Soviets Large Sea Force/US Large Land Force - Soviets as in (2), but US replaces 192 POSIDON SLBMs (12 SSBNs) with MMIII ICBMs.

(4) Soviets Large Land Force/US Large Sea Force - Soviets use Base Case, and US replaces 592 ICBMs with ULM SLBMs.

(5) Both About Equally Divided - Both sides replace 192 ICBMs with SLBMs.

b. The technological improvements assumed for the Soviet forces in Figures 5-A and 5-B consisted of:

(1) SSZ3 (MIRV) has ten RVs, each with a yield of 2 megatons and a CEP of 0.16 nautical miles. (Base Case has 6 RVs at 1.2 MT and 0.25 nm.)

(2) The SSZ9 has three RVs, each with a yield of 0.5 megatons and a CEP of 0.16 nautical miles. (Base Case has 1 RV at 1.2 MT and .25 nm.)

(3) The SSZ10 has three RVs, each with a yield of 2.0 megatons and a CEP of 0.25 nautical miles. (Base Case has 1 RV at 1.2 MT and 0.5 nm.)

(4) The SSN5 has a single RV with a yield of 1.5 megatons. (Base Case has 1 RV at 1.2 MT.)

(5) The SSNZ1 (MIRV) has a yield per RV of 0.5 megatons. (Base Case has 3 RVs at 0.4 MT)

5. Three types of Ballistic Missile Defense have been used in this analysis.

a. Terminal BMD - The SMIPET model uses the same no leakage, terminal BMD used in the CODE 50 model. This is an analytical technique in which it is assumed that defenses are overcome by targeting sufficient terminal objects (RVs plus decoys) to exhaust 85 percent of the interceptors stationed at the target, and RVs used to exhaust cause no damage. When assigning interceptors to cities, the numbers assigned per city are proportional to city population, subject to the constraint of having a minimum of 17 reliable interceptors (i. e., 20 each with reliability of 0.85) at any defended city. A limited test case indicated a more efficient deployment would be to have a minimum of 4.25 reliable interceptors (5 total) at a defended city. However, it was considered that comparability with all other analyses in the paper, in which the larger minimum was used, dictated use of the same number in this portion.

b. Nationwide Random Area BMD - In this type defense, each attacking missile RV has a probability of being destroyed equal to the ratio of the total number of reliable interceptors available divided by the total number of objects (RVs plus decoys) expected to arrive at the Area Defense.

c. Mid-Course Area BMD - In this type of defense the interceptor is targeted against a missile booster, rather than the individual RVs and decoys. It is assumed that a successful booster intercept wil result in destroying either all or some fraction of the objects (RVs plus decoys) carried by the booster. In this analysis it was assumed that a mid-course interceptor could defend against only one type of missile booster, either against land based ICBMs or against SLBMs but not both. Those defending against land based ICBMs could each destroy half the objects carried by a booster, but those defending against SLBMs could destroy all objects carried in a booster.

DECLASSIFIED
SECRET

BASE CASE

OPTION 3 — **% DAMAGE TO SOVIET** | **US STRIKES FIRST** — **% DAMAGE TO US**

ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
120	521		0 ABM	140	201	
1040	3958	1566		580	530	1031
31	181	808		165	304	651
112	553		200 Area ABM	153	225	
1032	3856	1566		503	459	1031
31	179	808		113	208	651
110	487		500 Area ABM	156	242	
1013	3844	1566		368	336	1031
31	176	808		41	75	651
140	908		500 Area ABM 1000 Terminal ABM at Cities	336	310	
914	2847	1566		182	166	1031
32	177	808		0	0	651
153	794		500 Area ABM 2000 Terminal ABM at Cities	553	527	
893	3007	1566		0	0	1031
34	176	808		0	0	651
237	967		1000 Area ABM 4000 Terminal ABM at Cities	326	366	
729	2325	1566		0	0	1031
19	159	808		0	0	651

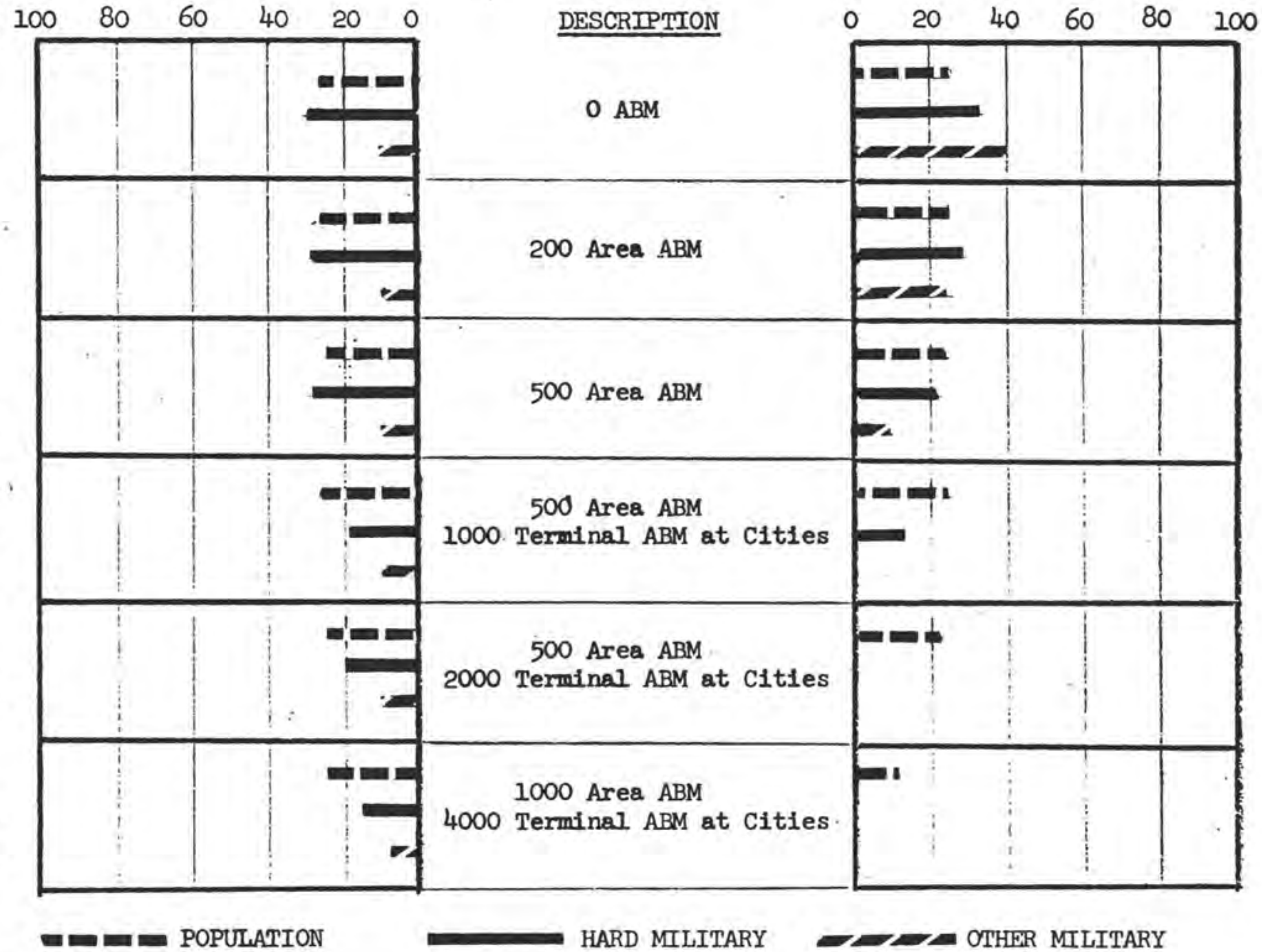


FIGURE 1-A

DECLASSIFIED
SECRET

OPTION 3

SOVIET STRIKES FIRST

BASE CASE

% DAMAGE TO SOVIET | % DAMAGE TO US

ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGT
113	601		0 ABM	107	70	
431	2702	1566		2460	2246	1031
13	113	808		280	480	651
115	622		200 Area ABM	180	141	
436	2619	1566		2247	2051	1031
13	109	808		276	464	651
125	610		500 Area ABM	152	118	
435	2513	1566		2089	1907	1031
12	105	808		248	420	651
248	755		500 Area ABM 1000 Terminal ABM at Cities	397	439	
234	1949	1566		1616	1475	1031
12	105	808		304	374	651
282	715		500 Area ABM 2000 Terminal ABM at Cities	570	653	
288	1936	1566		1530	1397	1031
16	117	808		23	43	651
238	983		1000 Area ABM 4000 Terminal ABM at Cities	764	765	
585	1990	1566		365	333	1031
12	104	808		0	0	651

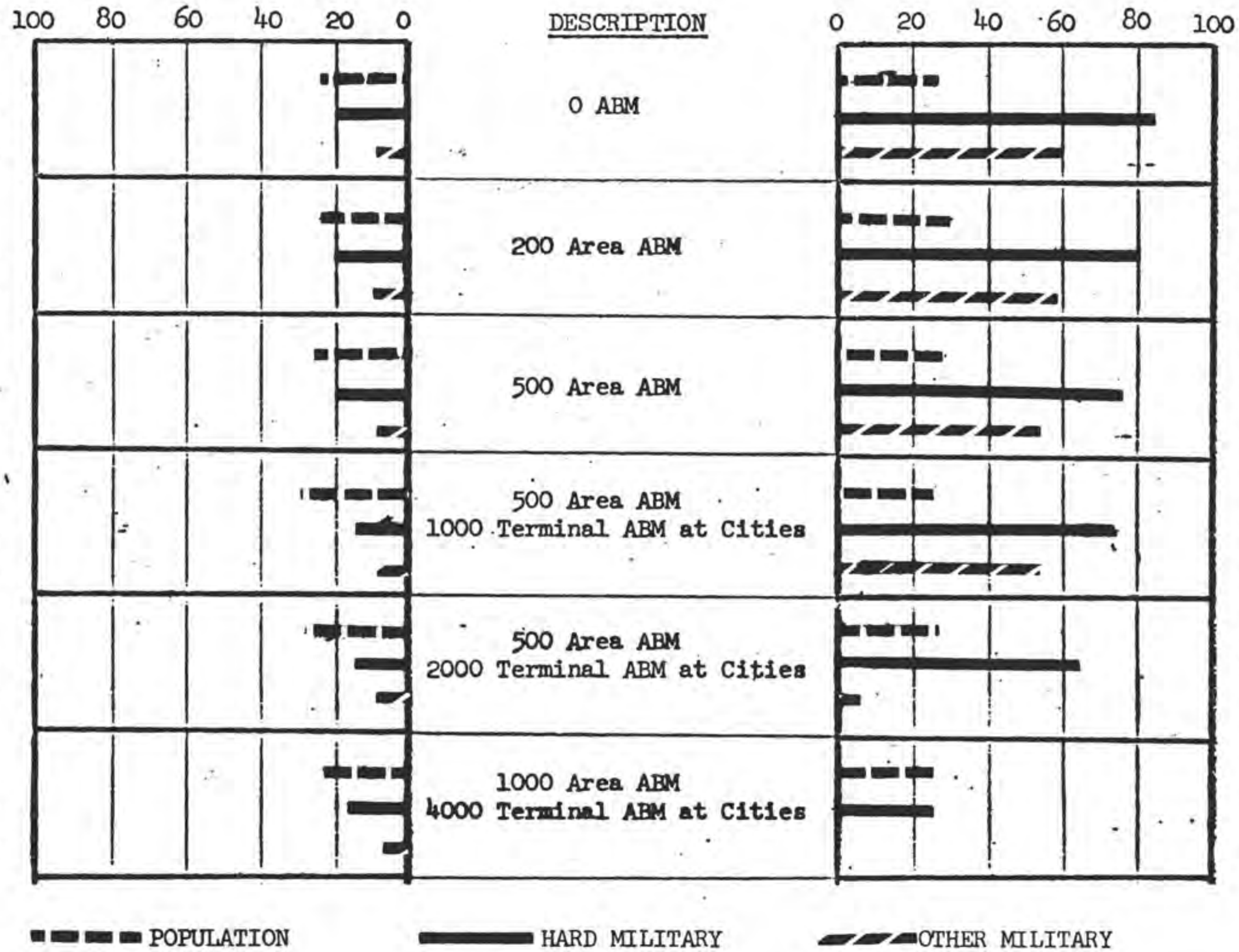
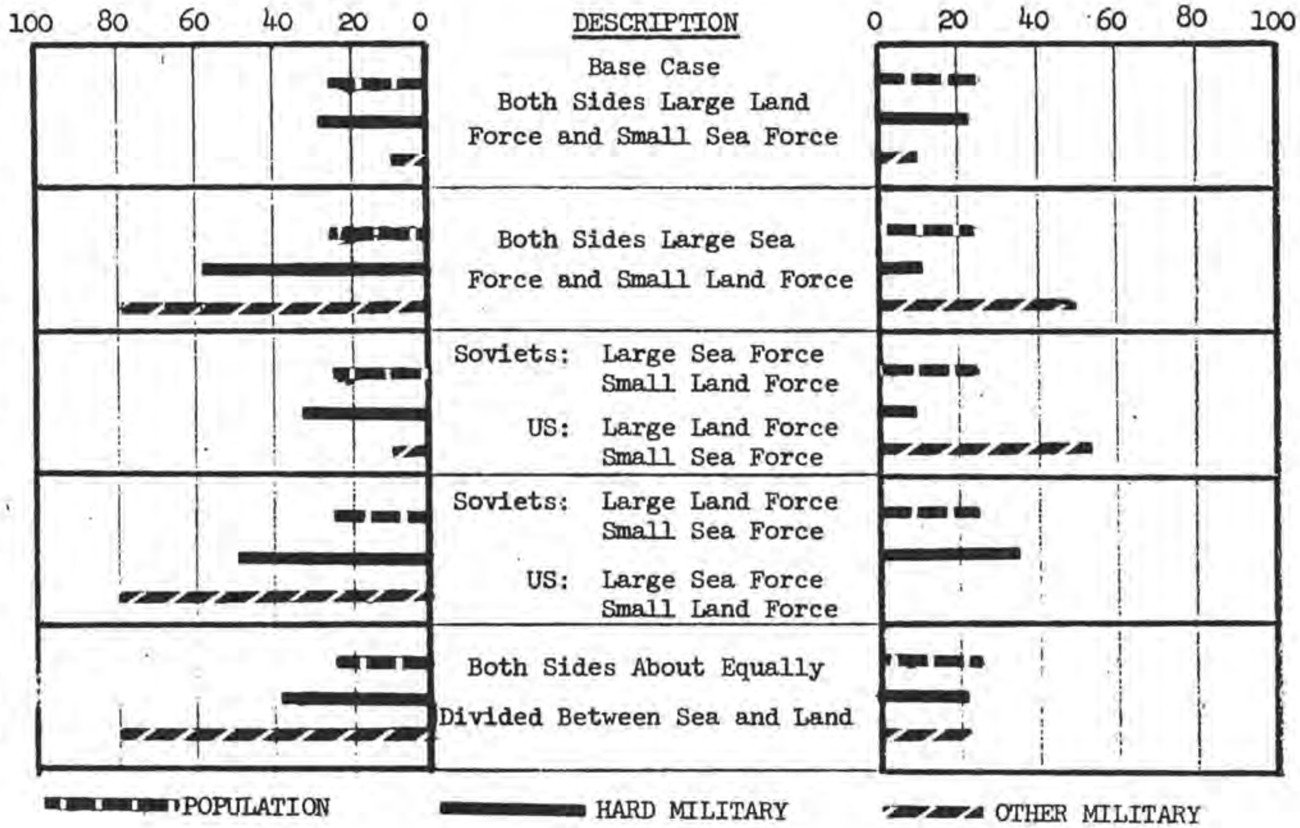


FIGURE 1-B

MIXED SEA/LAND OFFENSIVES
(Both Sides 500 Area ABM)

OPTION 3 — US STRIKES FIRST

% DAMAGE TO SOVIET — % DAMAGE TO US

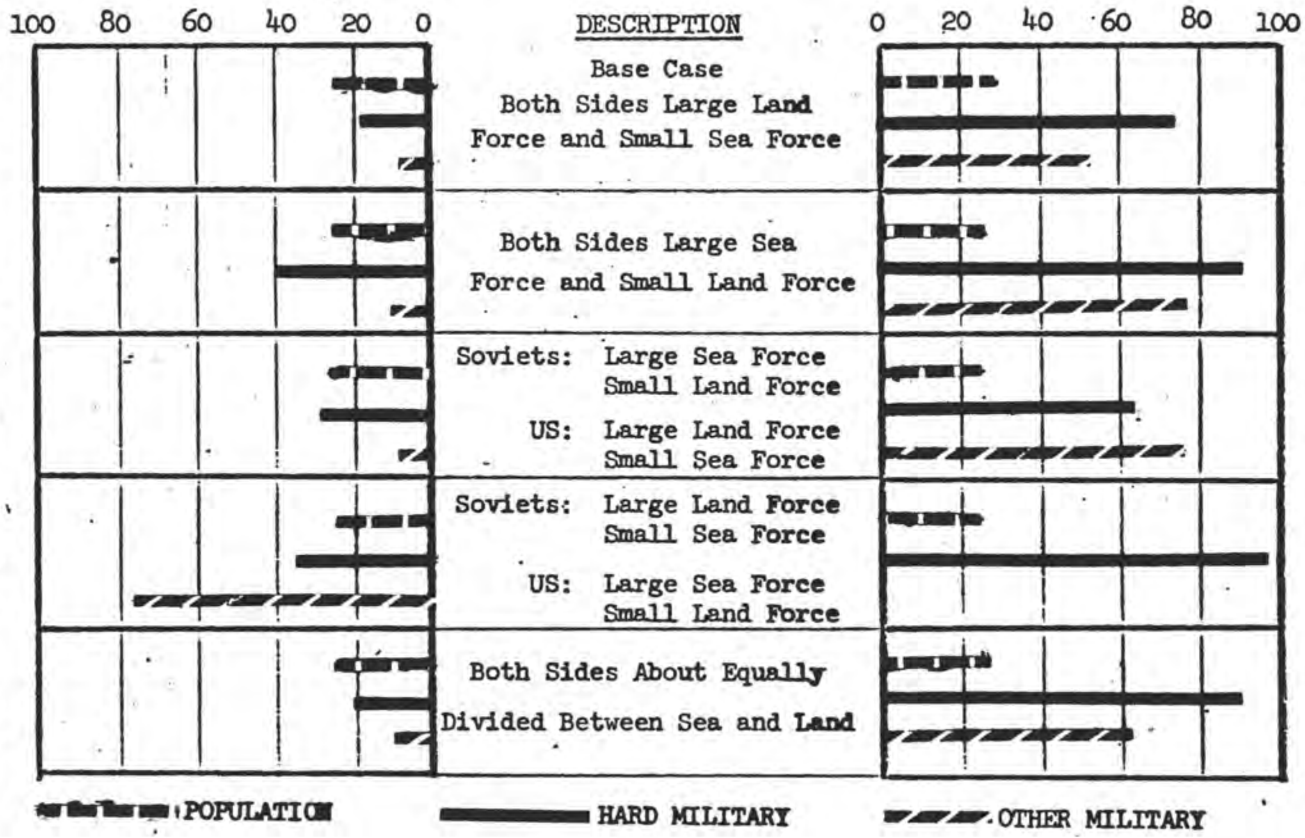


ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
110	487		Base Case	156	242	
1013	3844	1566	Both Sides Large Land	368	336	1031
31	176	808	Force and Small Sea Force	41	75	651
102	626			160	271	
897	5193	974	Both Sides Large Sea	95	86	647
98	759	808	Force and Small Land Force	242	446	651
110	337		Soviets: Large Sea Force Small Land Force	150	244	
994	3170	974		155	141	1223
24	177	808	US: Large Land Force Small Sea Force	276	508	651
102	653		Soviets: Large Land Force Small Sea Force	167	274	
902	6121	1566		241	220	439
101	757	808	US: Large Sea Force Small Land Force	0	0	651
99	514		Both Sides About Equally	159	255	
932	4268	1374		260	237	839
95	760	808	Divided Between Sea and Land	97	179	651

FIGURE 2-A

MIXED SEA/LAND OFFENSIVES
(Both Sides 500 Area ABM)

OPTION 3 — SOVIETS STRIKE FIRST



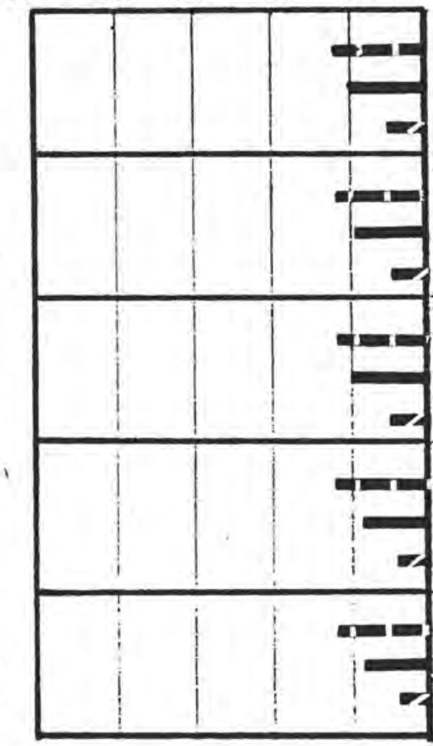
% Damage to Soviet: ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	% Damage to US: ARR MTE	ARR R/V	NO. TGTS
125	610		Base Case	152	118	
435	2513	1566	Both Sides Large Land	2089	1907	1031
12	105	808	Force and Small Sea Force	248	420	651
99	795		Both Sides Large Sea	124	135	
559	4432	974	Force and Small Land Force	1785	1630	647
34	171	808		465	857	651
179	326		Soviets: Large Sea Force Small Land Force	118	135	
366	1877	974	US: Large Land Force	1797	1640	1223
12	105	808	Small Sea Force	459	846	651
97	787		Soviets: Large Land Force Small Sea Force	145	265	
596	5085	1566	US: Large Sea Force	2344	2179	439
106	743	808	Small Land Force	0	0	651
112	715		Both Sides About Equally	151	122	
440	3336	1374	Divided Between Sea and Land	2004	1830	839
20	169	808		300	552	651

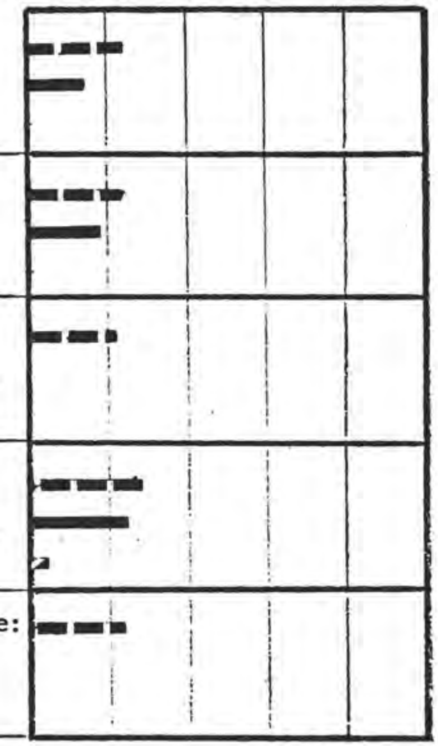
FIGURE 2-B

MIXED SEA/LAND DEFENSES
(Both Sides 1000 City ABM)

OPTION 3 — % DAMAGE TO SOVIET

US STRIKES FIRST — % DAMAGE TO US





ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
356	1423		Base Case 1500 ABM	324	300	
777	2906	1566	(1000 Terminal City and	217	198	1031
21	176	808	500 Area Nation-Wide)	1	2	651
468	1529		500 Soviet Area ABM Are:	328	307	
511	2662	1566	Mid-Course VS ICBM a/	268	244	1031
13	113	808		2	3	651
356	1423		500 US Area ABM Are:	465	424	
777	2906	1566	300 Mid-Course VS ICBM) a/	0	0	1031
21	176	808	200 Mid-Course VS SLBM)	0	0	651
493	1218		500 Soviet Area ABM Are:	386	362	
389	1702	1566	300 Mid-Course VS ICBM) a/	370	338	1031
15	127	808	200 Mid-Course VS SLBM)	12	22	651
184	610		Both Sides 500 Area ABM Are:	499	455	
639	1947	1566	300 Mid-Course VS ICBM)	0	0	1031
26	144	808	200 Mid-Course VS SLBM)	0	0	651

POPLULATION — HARD MILITARY — OTHER MILITARY

a/ Other side has 500 nation-wide area ABM.

FIGURE 3-A

SECRET

DECLASSIFIED

MIXED SEA/LAND DEFENSES

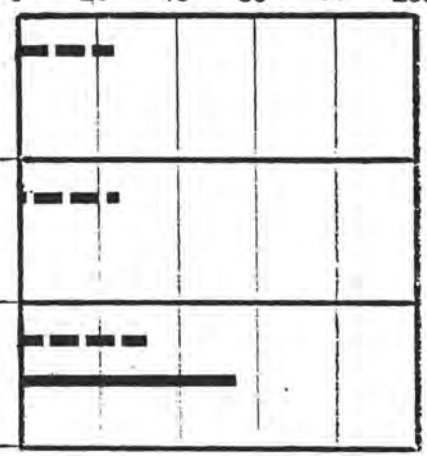
(Continued)

OPTION 3

US STRIKES FIRST

% DAMAGE TO SOVIET

% DAMAGE TO US



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
104	411		Base Case	165	193	
994	3787	1566	1000 Area Nationwide	0	0	1031
21	171	808	ABM Both Sides	0	0	651
136	834		Soviets: 1000 Terminal City ABM	183	167	
952	3055	1566	US: 600 Mid-Course vs ICBM	0	0	1031
34	182	808	400 Mid-Course vs SLBM	0	0	651
162	305		Soviets:	384	383	
430	1046	1566	600 Mid-Course vs ICBM 400 Mid-Course vs SLBM	852	777	1031
12	101	808	US: 1000 Terminal City ABM	2	3	651

POPULATION — HARD MILITARY — OTHER MILITARY

DECLASSIFIED

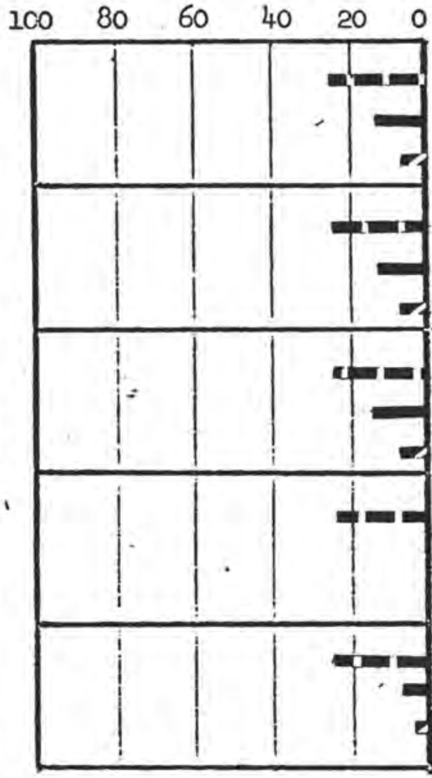
FIGURE 3-A (Continued)

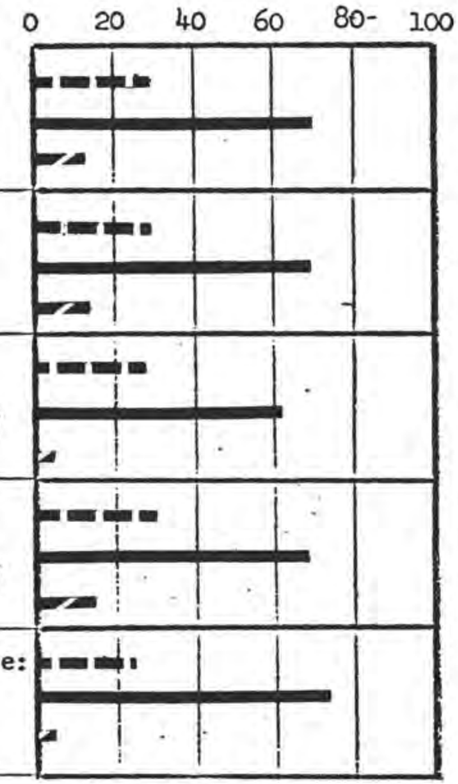
MIXED SEA/LAND DEFENSES
(Both Sides 1000 City ABM)

OPTION 3 — % DAMAGE TO SOVIET

SOVIETS STRIKE FIRST — % DAMAGE TO US

ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
476	1991		Base Case 1500 ABM	414	473	
150	1284	1566	(1000 Terminal City and	1745	1593	1031
6	53	808	500 Area Nation-Wide)	52	96	651
386	2216			414	473	
129	1101	1566	500 Soviet Area ABM Are:	1745	1593	1031
7	56	808	Mid-Course VS ICBM a/	52	96	651
498	1803		500 US Area ABM Are:	397	341	
181	1551	1566	300 Mid-Course VS ICBM) a/	1411	1288	1031
12	103	808	200 Mid-Course VS SLBM)	28	26	651
366	2005		500 Soviet Area ABM Are:	414	473	
0	0	1566	300 Mid-Course VS ICBM) a/	1745	1593	1031
0	0	808	200 Mid-Course VS SLBM)	52	96	651
206	1028		Both Sides 500 Area ABM Are:	428	370	
56	483	1566	300 Mid-Course VS ICBM)	1518	1386	1031
4	32	808	200 Mid-Course VS SLBM)	28	26	651





POPLULATION — HARD MILITARY — OTHER MILITARY

a/ Other side has 500 nation-wide area ABM.

FIGURE 3-B

DECLASSIFIED

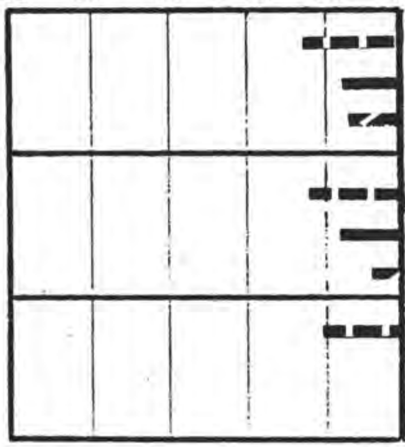
SECRET

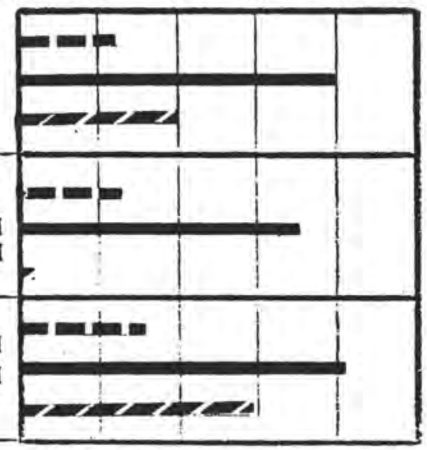
MIXED SEA/LAND DEFENSES

(Continued)

OPTION 3 | **SOVIETS STRIKE FIRST**

% DAMAGE TO SOVIET | **% DAMAGE TO US**





ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
130	686		Base Case	127	103	
336	2172	1566	1000 Area Nationwide	1830	1671	1031
11	96	808	ABM Both Sides	173	319	651
166	901		Soviets: 1000 Terminal City ABM	159	132	
419	2006	1566	US: 600 Mid-Course vs ICBM	1521	1389	1031
13	113	808	400 Mid-Course vs SLBM	21	19	651
122	526		Soviets:	390	407	
0	0	1566	600 Mid-Course vs ICBM / 400 Mid-Course vs SLBM	1747	1594	1031
0	0	808	US: 1000 Terminal City ABM	325	414	651

POPULATION — HARD MILITARY — OTHER MILITARY

DECLASSIFIED

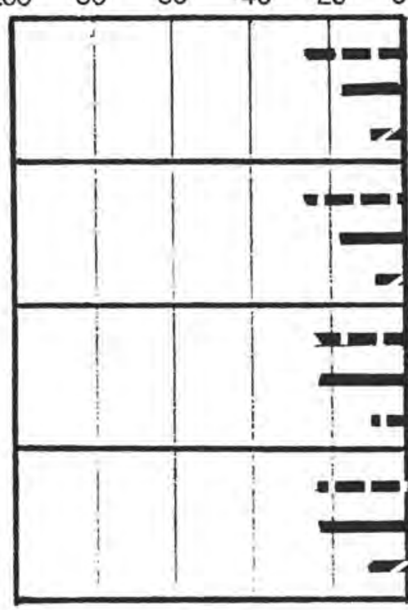
FIGURE 3-B (Continued)

MIXED AREA/CITY ABM

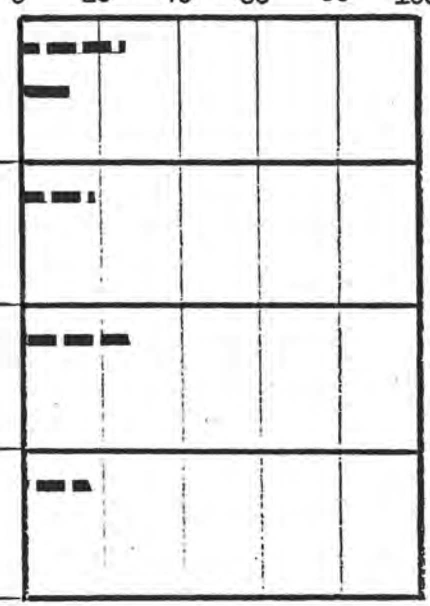
OPTION 3

US STRIKES FIRST

% DAMAGE TO SOVIET



% DAMAGE TO US



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
140	908		Base Case	336	310	
914	2847	1566	Both Sides Have 500 Area	182	166	1031
32	177	808	1000 Terminal ABM	0	0	651
140	908		Soviets Have: 500 Area/1000 City ABM	295	333	
914	2847	1566		0	0	1031
32	177	808	US Has: 1000 Area/500 City ABM	0	0	651
118	740		Soviets Have: 1000 Area/500 City ABM	464	452	
938	3227	1566		0	0	1031
32	171	808	US Has: 500 Area/1000 City ABM	0	0	651
118	740		Both Sides Have:	240	274	
938	3227	1566	1000 Area/500 City ABM	0	0	1031
32	171	808		0	0	651

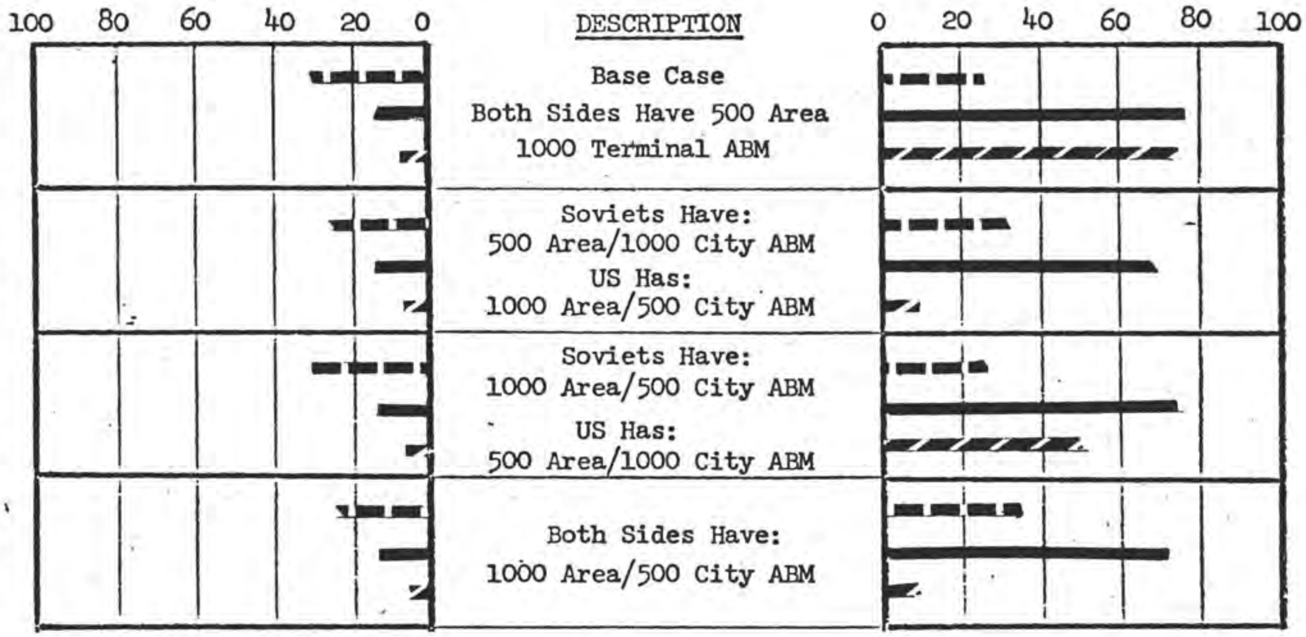
POPULATION HARD MILITARY OTHER MILITARY

FIGURE 4-A

MIXED AREA/CITY ABM

OPTION 3

SOVIETS STRIKE FIRST



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
248	755		Base Case	397	439	
234	1949	1566	Both Sides Have 500 Area	1616	1475	1031
12	105	808	1000 Terminal ABM	304	374	651
187	948		Soviets Have: 500 Area/1000 City ABM	385	443	
357	1873	1566	US Has:	1466	1339	1031
12	105	808	1000 Area/500 City ABM	40	74	651
241	792		Soviets Have: 1000 Area/500 City ABM	397	439	
237	1990	1566	US Has:	1616	1475	1031
11	96	808	500 Area/1000 City ABM	304	374	651
150	756		Both Sides Have:	385	443	
366	1927	1566	1000 Area/500 City ABM	1466	1339	1031
11	98	808		40	74	651

POPULATION — HARD MILITARY — OTHER MILITARY

FIGURE 4-B

SOVIET IMPROVED TECHNOLOGY

OPTION 3 — US STRIKES FIRST

DESCRIPTION	% DAMAGE TO SOVIET: ARR MTE	ARR R/V	NO. TGTS	% DAMAGE TO US: ARR MTE	ARR R/V	NO. TGTS
BASE CASE — Both Sides Have No ABMs	120	521		140	201	
	1040	3958	1566	580	530	1031
	31	181	808	165	304	651
Improved MIRVs, Accuracy and Yield	119	309		148	189	
	1032	4012	1566	1006	1480	1031
	38	322	808	278	489	651
BASE CASE — Both Sides Have 1500 ABMs (500 Area, 1000 Terminal)	140	908		336	310	
	914	2847	1566	182	166	1031
	32	177	808	0	0	651
Improved MIRVs, Accuracy and Yield	139	756		440	657	
	954	3319	1566	628	937	1031
	20	127	808	16	25	651

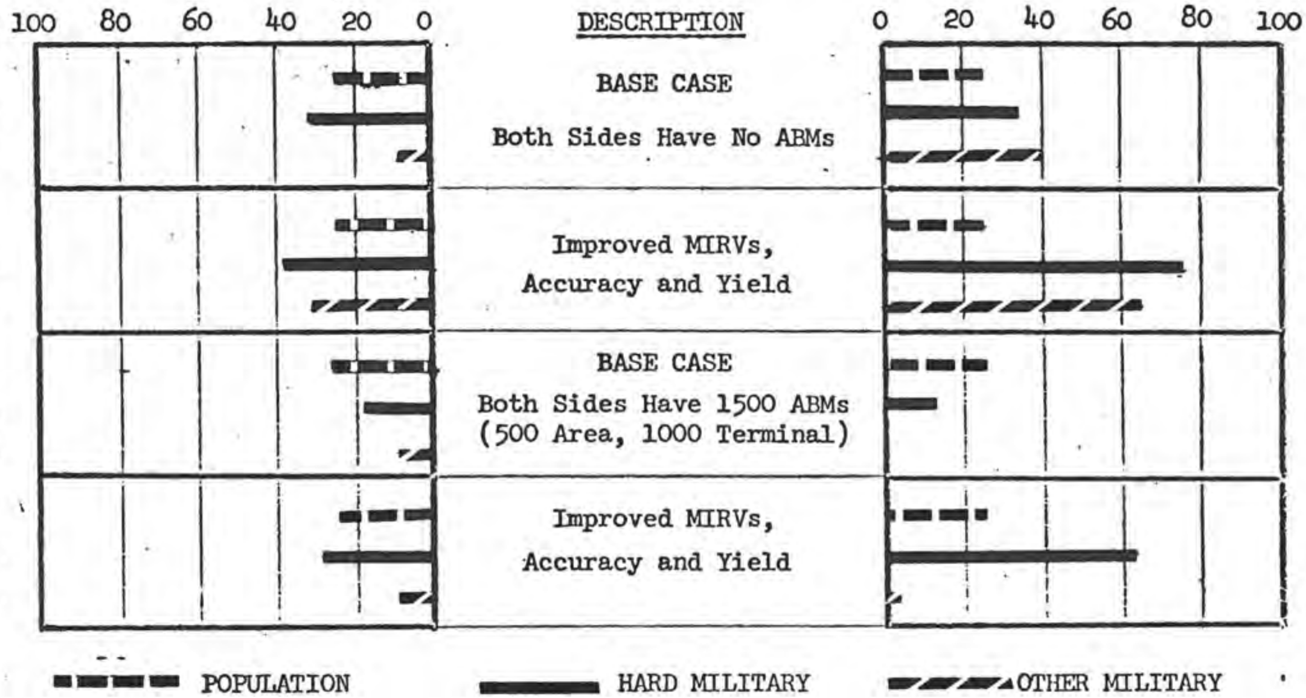


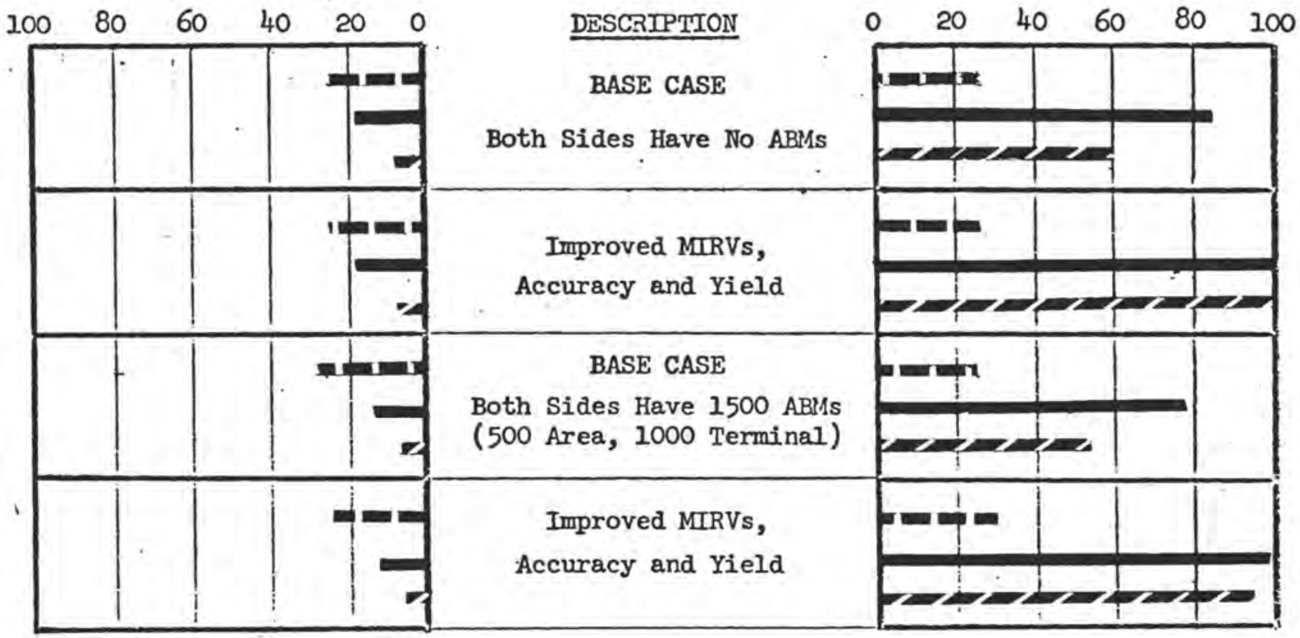
FIGURE 5-A

DECLASSIFIED SECRET

SOVIET IMPROVED TECHNOLOGY

OPTION 3 — **SOVIETS STRIKE FIRST**

% DAMAGE TO SOVIET — % DAMAGE TO US



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
113	601		BASE CASE	107	70	
431	2702	1566	Both Sides Have No ABMs	2460	2246	1031
13	113	808		280	480	651
104	631		Improved MIRVs,	119	82	
289	2467	1566	Accuracy and Yield	4494	3852	1031
13	110	808		925	1337	651
248	755		BASE CASE	397	439	
234	1949	1566	Both Sides Have 1500 ABMs	1616	1475	1031
12	105	808	(500 Area, 1000 Terminal)	304	374	651
147	1007		Improved MIRVs,	408	350	
146	1220	1566	Accuracy and Yield	3443	3087	1031
6	50	808		893	1176	651

POPULATION — HARD MILITARY — OTHER MILITARY

FIGURE 5-B

DECLASSIFIED SECRET

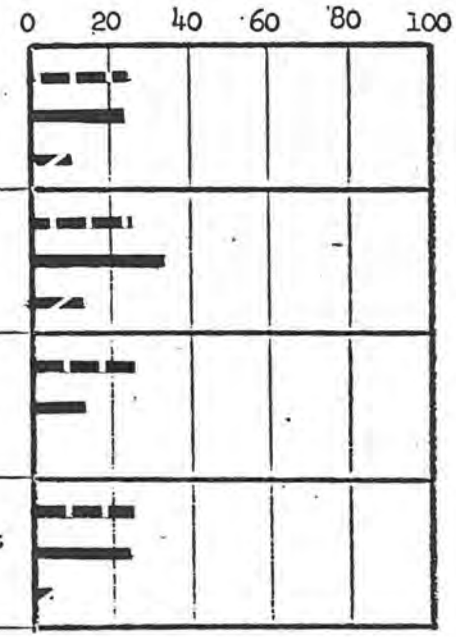
ASW IMPROVEMENTS
(Both Sides 500 Area ABM)

OPTION 3

US STRIKES FIRST

% DAMAGE TO SOVIET

% DAMAGE TO US



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
110	487		Base Case	156	242	
1013	3844	1566		368	336	1031
31	176	808		41	75	651
143	383		US Loses 50 Percent SLBM to Improved ASW	150	230	
782	2389	1566		496	453	1031
30	169	808		60	110	651
101	473		Soviets Lose 50 Percent SLBM to Improved ASW	177	216	
1022	3857	1566		182	166	1031
31	176	808		0	0	651
143	383		Both Sides Lose 50 Percent SLBM to Improved ASW	161	203	
782	2389	1566		374	342	1031
30	169	808		10	18	651

POPULATION   HARD MILITARY   OTHER MILITARY

FIGURE 6-A

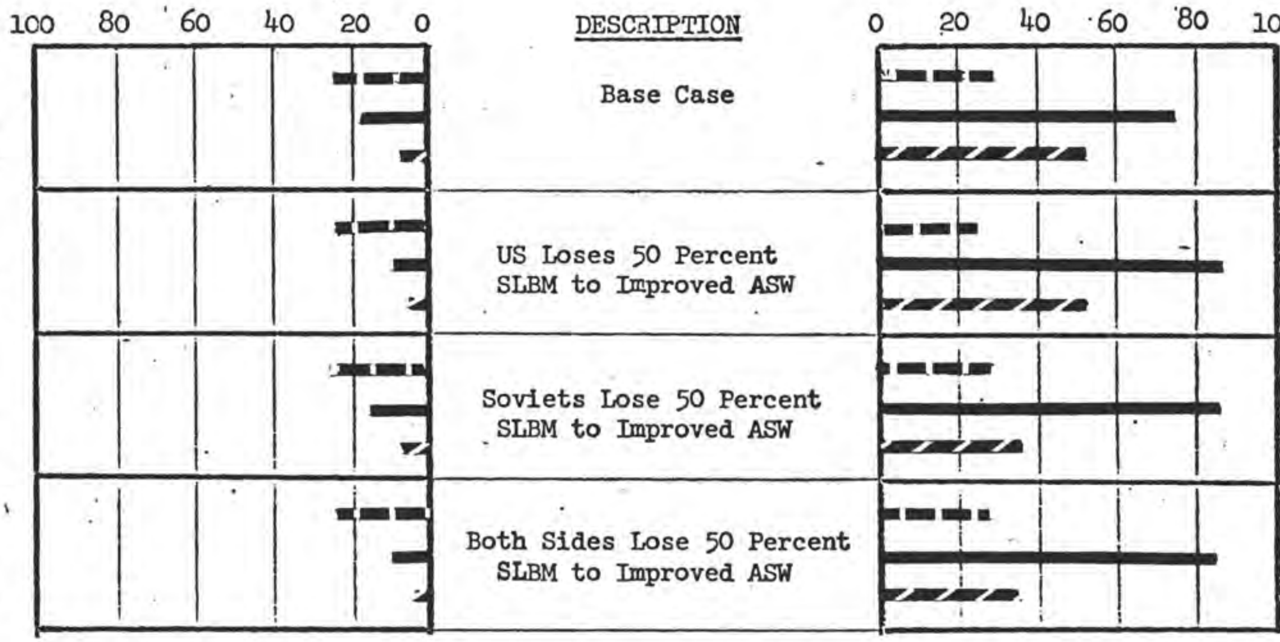
ASW IMPROVEMENTS
(Both Sides 500 Area ABM)

OPTION 3

SOVIETS STRIKE FIRST

% DAMAGE TO SOVIET

% DAMAGE TO US

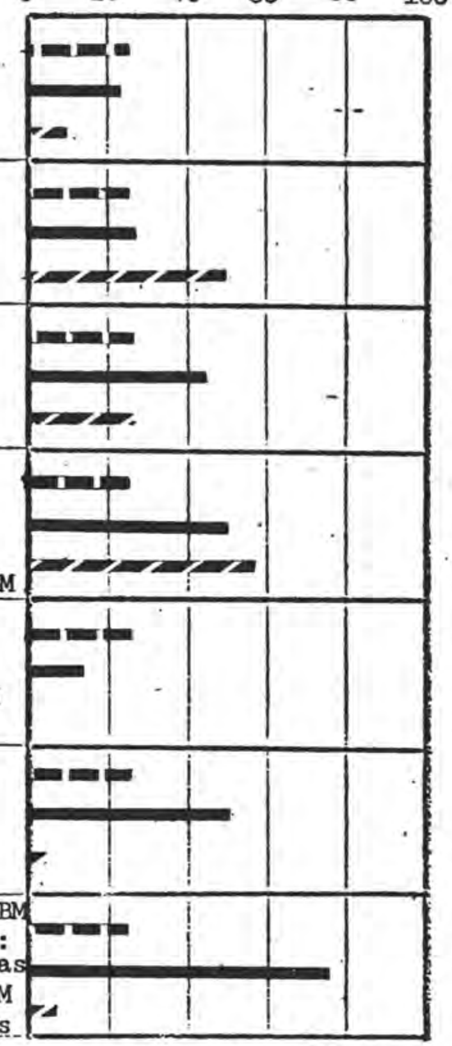


ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
125	610		Base Case	152	118	
435	2513	1566		2089	1907	1031
12	105	808		248	420	651
175	683		US Loses 50 Percent SLBM to Improved ASW	135	99	
96	822	1566		2109	1925	1031
6	49	808		245	420	651
116	628		Soviets Lose 50 Percent SLBM to Improved ASW	149	113	
365	2395	1566		1995	1821	1031
12	104	808		209	287	651
189	674		Both Sides Lose 50 Percent SLBM to Improved ASW	149	113	
100	856	1566		1995	1821	1031
6	49	808		209	287	651

POPULATION   HARD MILITARY   OTHER MILITARY

FIGURE 6-B

OPTION 3 — % DAMAGE TO SOVIET | US STRIKES FIRST — % DAMAGE TO US



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
110	487		Base Case	156	242	
1013	3844	1566	500 Area ABM	368	336	1031
31	176	808		41	75	651
110	487		500 Area ABM Agreement	162	150	
1013	3844	1566	Soviets Covertly Add 500 Mobile Land ICBMs	452	412	1031
31	176	808		298	428	651
119	481		500 Area ABM Agreement	151	197	
1004	3849	1566	Soviets Covertly Replace 700 IR/MRBM with ICBMs	882	806	1031
31	176	808		117	216	651
119	481		500 Area ABM Agreement Soviets Covertly:	170	156	
1004	3849	1566	1) Add 500 Mobile ICBMs	989	903	1031
31	176	808	2) Replace 700 IR/MRBM w/ICBM	351	497	651
140	908		Base Case	336	310	
914	2847	1566	500 Area & 1000 Terminal ABM	182	166	1031
32	177	808		0	0	651
34	152		500 Area and 1000 Terminal ABM Agreement	275	296	
553	1166	1566	Soviets Covertly Add 500 Area ABM[a]	831	759	1031
5	26	808		13	24	651
213	427		500 Area and 1000 Terminal ABM Agreement. Soviets Covertly:	295	335	
348	831	1566	1-Add 500 Area ABM Deployed as Above[a] 2-Add 500 Mobile ICBM	1578	1436	1031
9	80	808	3-Replace 700 IR/MRBM w/ICBMs	30	50	651

POPULATION — HARD MILITARY — OTHER MILITARY

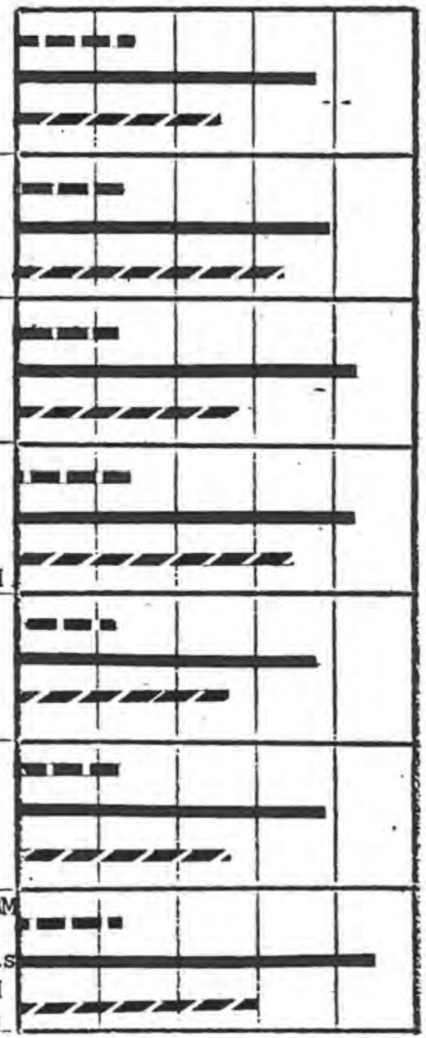
a/ 1000 Soviet Area ABM Deployed: 600 Mid-Course VS ICBM, 400 Mid-Course VS SLBM

FIGURE 7-A

CH. NG

OPTION 3 — SOVIETS STRIKE FIRST

% DAMAGE TO SOVIET — % DAMAGE TO US



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
125	610		Base Case	152	118	
435	2513	1566		2089	1907	1031
12	105	808	500 Area ABM	248	420	651
117	607		500 Area ABM Agreement	155	118	
419	2479	1566	Soviets Covertly Add	2229	2035	1031
14	110	808	500 Mobile Land ICBMs	465	624	651
114	614		500 Area ABM Agreement	182	94	
358	2377	1566	Soviets Covertly Replace	2716	2479	1031
12	103	808	700 IR/MRBM with ICBMs	264	436	651
119	634		500 Area ABM Agreement Soviets Covertly:	163	130	
354	2339	1566	1) Add 500 Mobile ICBMs	2818	2573	1031
12	103	808	2) Replace 700 IR/MRBM w/ICBM	485	639	651
248	755		Base Case	397	439	
234	1949	1566		1616	1475	1031
12	105	808	500 Area & 1000 Terminal ABM	304	374	651
37	135		500 Area and 1000 Terminal ABM Agreement	397	439	
32	272	1566	Soviets Covertly Add	1616	1475	1031
2	15	808	500 Area ABM[a]	304	374	651
71	320		500 Area and 1000 Terminal ABM Agreement. Soviets Covertly:	330	344	
0	0	1566	1-Add 500 Area ABM Deployed as Above[a] 2-Add 500 Mobile ICBM	2371	2140	1031
0	0	808	3-Replace 700 IR/MRBM w/ICBMs	385	484	651

▬ ▬ ▬ POPULATION ▬▬▬ HARD MILITARY ▰▰▰ OTHER MILITARY

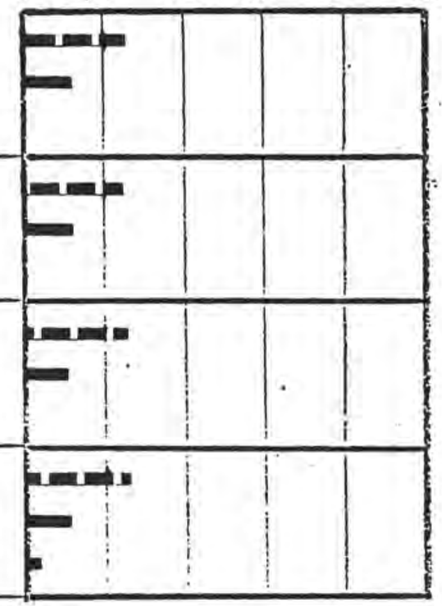
a/ 1000 Soviet Area ABM Deployed: 600 Mid-Course VS ICBM, 400 Mid-Course VS SLBM

FIGURE 7-B

OPTION 3 — PENAID FAILURE a/ — US STRIKES FIRST

% DAMAGE TO SOVIET

% DAMAGE TO US



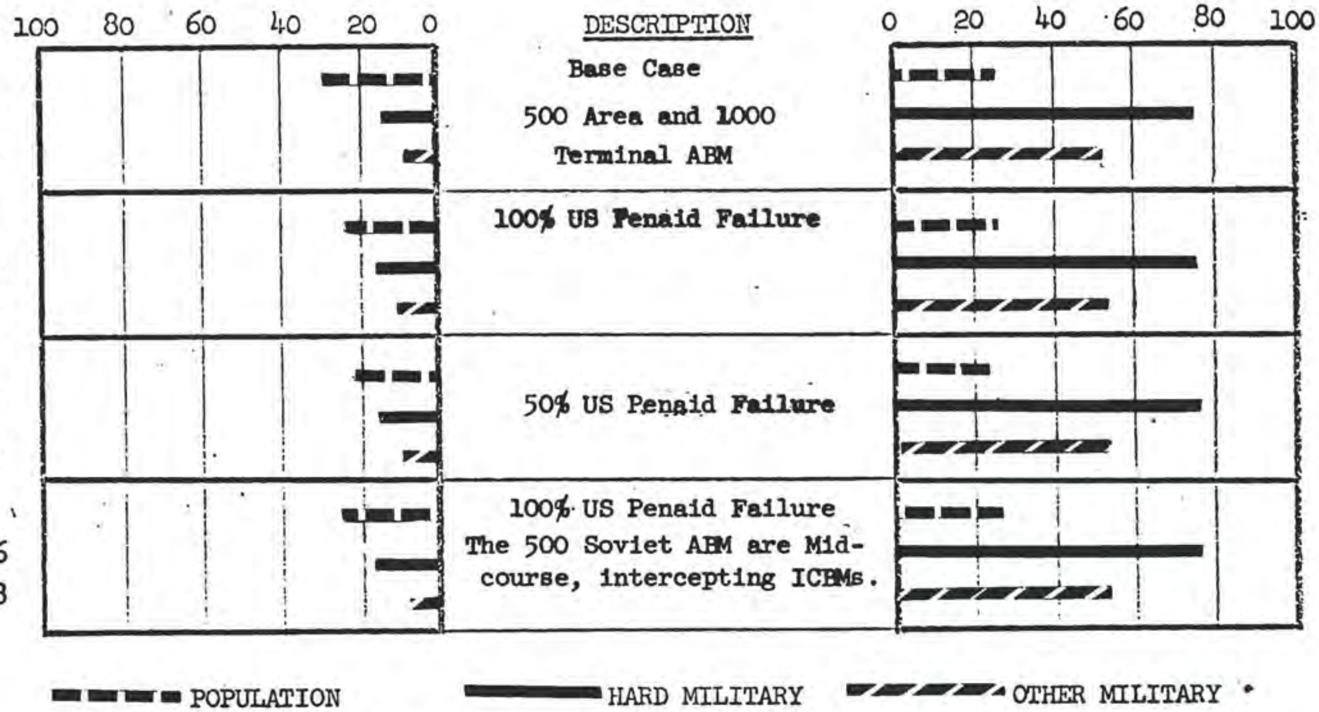
ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
140	908		Base Case	336	310	
914	2847	1566	500 Area and 1000	182	166	1031
32	177	808	Terminal ABM	0	0	651
136	880		100% US Penaid Failure	334	305	
897	2793	1566		173	158	1031
32	173	808		3	5	651
139	904			349	319	
911	2837	1566	50% US Penaid Failure	156	142	1031
32	176	808		2	4	651
134	912		100% US Penaid Failure	365	356	
764	2740	1566	The 500 Soviet ABM are Mid-	176	161	1031
38	171	808	course, intercepting ICBMs.	11	21	651

POPULATION   HARD MILITARY   OTHER MILITARY

a/ US targets assuming PENAIDS work, but they fail. Soviet Penaids work. Both sides have 500 Area/ 1000 City ABM.

FIGURE 8-A

OPTION 3 | PENAID FAILURE a/ | SOVIETS STRIKE FIRST



DESCRIPTION	Soviet ARR MTE	Soviet ARR R/V	Soviet NO. TGTS	US ARR MTE	US ARR R/V	US NO. TGTS
Base Case	248	755		397	439	
500 Area and 1000	234	1949	1566	1616	1475	1031
Terminal ABM	12	105	808	304	374	651
100% US Penaid Failure	179	698		397	439	
	230	1920	1566	1616	1475	1031
	12	103	808	304	374	651
50% US Penaid Failure	188	713		397	439	
	233	1943	1566	1616	1475	1031
	12	104	808	304	374	651
100% US Penaid Failure The 500 Soviet ABM are Mid-course, intercepting ICBMs.	146	913		397	439	
	271	1872	1566	1616	1475	1031
	13	113	808	304	374	651

a/ US targets assuming PENAIDS work, but they fail. Soviet Penaids work. Both sides have 500 Area/ 1000 City ABM.

FIGURE 8-B

SECRET

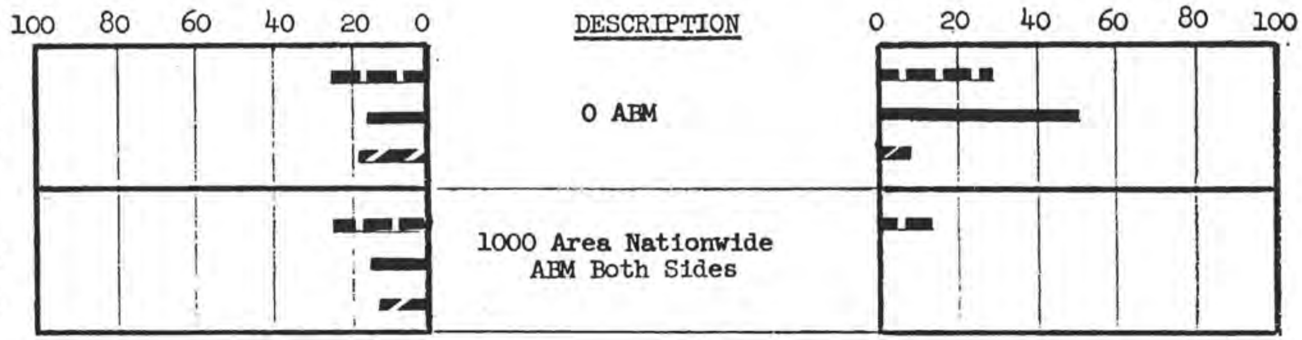
BASE CASES

OPTION 4

US STRIKES FIRST

% DAMAGE TO SOVIET

% DAMAGE TO US



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
172	161		0 ABM	192	150	
873	773	1566		882	680	1031
279	255	808		54	50	651
184	173		1000 Area Nationwide ABM Both Sides	60	45	
813	719	1566		0	0	1031
235	214	808		0	0	651

POPULATION   HARD MILITARY   OTHER MILITARY

FIGURE 9-A

DECLASSIFIED

SECRET

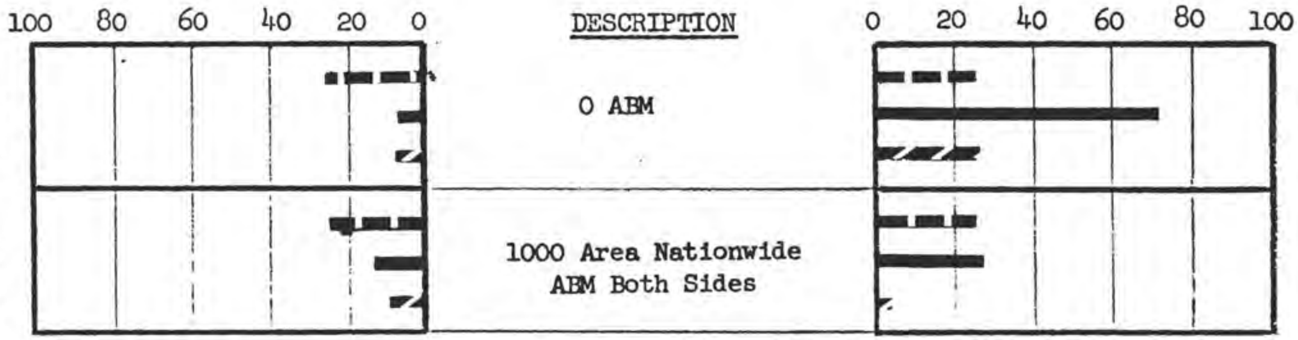
BASE CASES

OPTION 4

SOVIETS STRIKE FIRST

% DAMAGE TO SOVIET

% DAMAGE TO US



% Damage to Soviet: ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	% Damage to US: ARR MTE	ARR R/V	NO. TGTS
171	161		0 ABM	150	29	
330	297	1566		2587	978	1031
141	134	808		172	157	651
180	169		1000 Area Nationwide ABM Both Sides	200	74	
591	510	1566		886	347	1031
206	195	808		27	24	651

POPULATION   HARD MILITARY   OTHER MILITARY

FIGURE 9-B

DECLASSIFIED

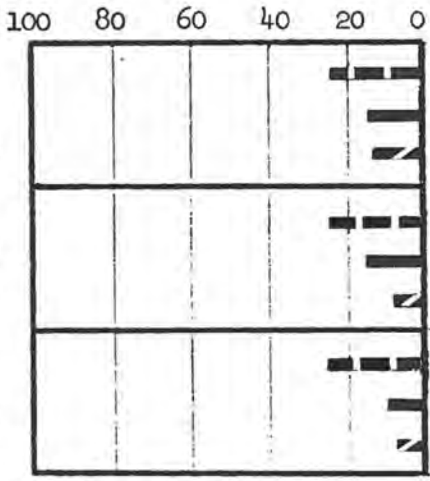
SECRET

MIXED SEA/LAND DEFENSES

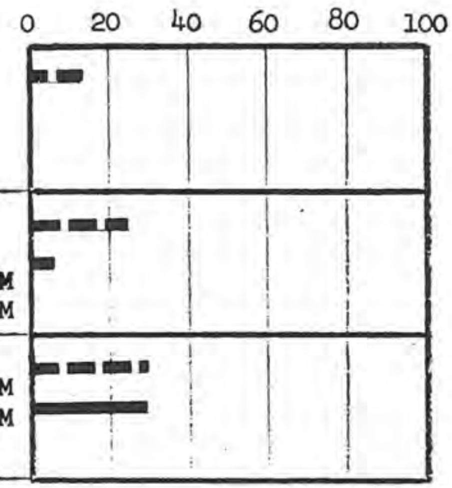
OPTION 4

US STRIKES FIRST

% DAMAGE TO SOVIET



% DAMAGE TO US



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
184	173		Base Case	200	45	
813	719	1566	1000 Area Nationwide	886	0	1031
235	214	808	ABM Both Sides	27	0	651
291	258		Soviets: 1000 Terminal	199	131	
806	725	1566	City ABM US: 600 Mid-Course vs ICBM	93	85	1031
134	116	808	400 Mid-Course vs SLBM	0	0	651
246	210		Soviets:	390	668	
367	335	1566	600 Mid-Course vs ICBM 400 Mid-Course vs SLBM	380	751	1031
122	113	808	US: 1000 Terminal City ABM	0	0	651

POPULATION — HARD MILITARY — OTHER MILITARY

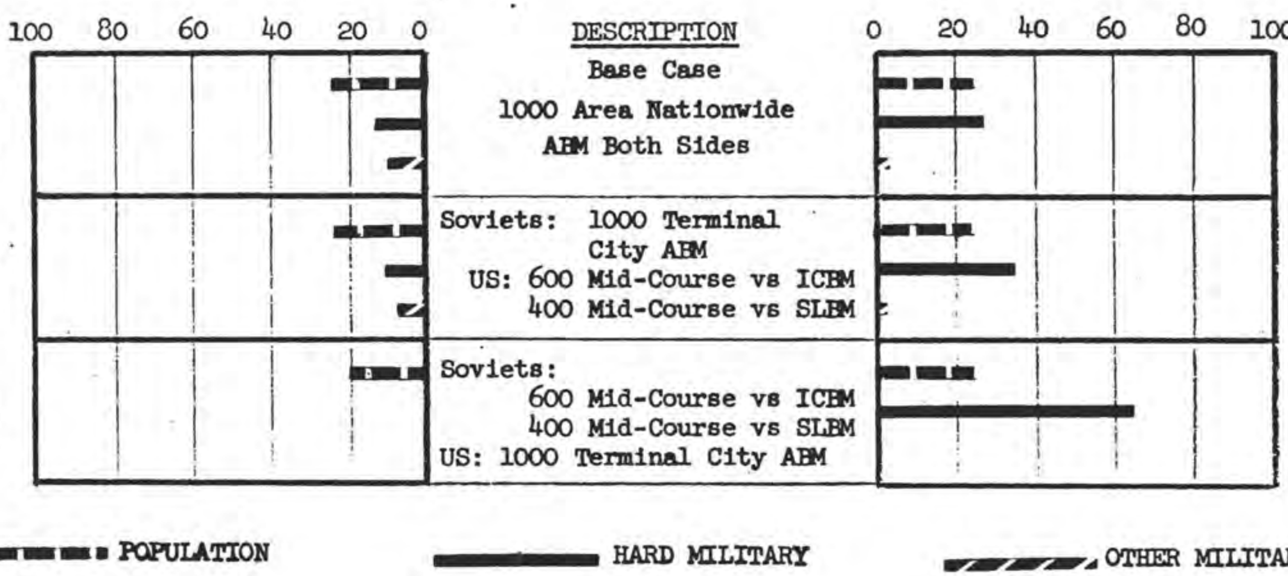
FIGURE 10-A

SECRET

MIXED SEA/LAND DEFENSES

OPTION 4 — **SOVIETS STRIKE FIRST**

% DAMAGE TO SOVIET — % DAMAGE TO US

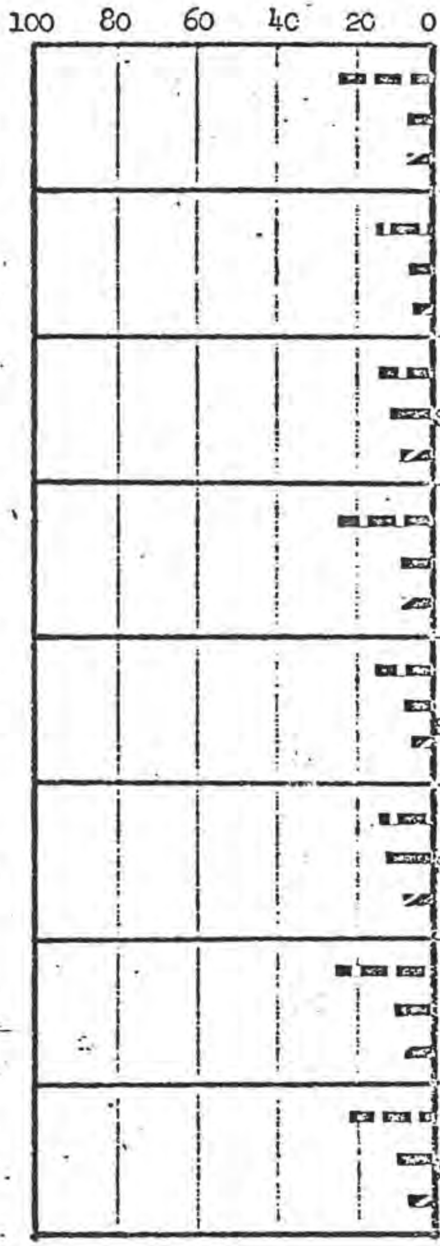


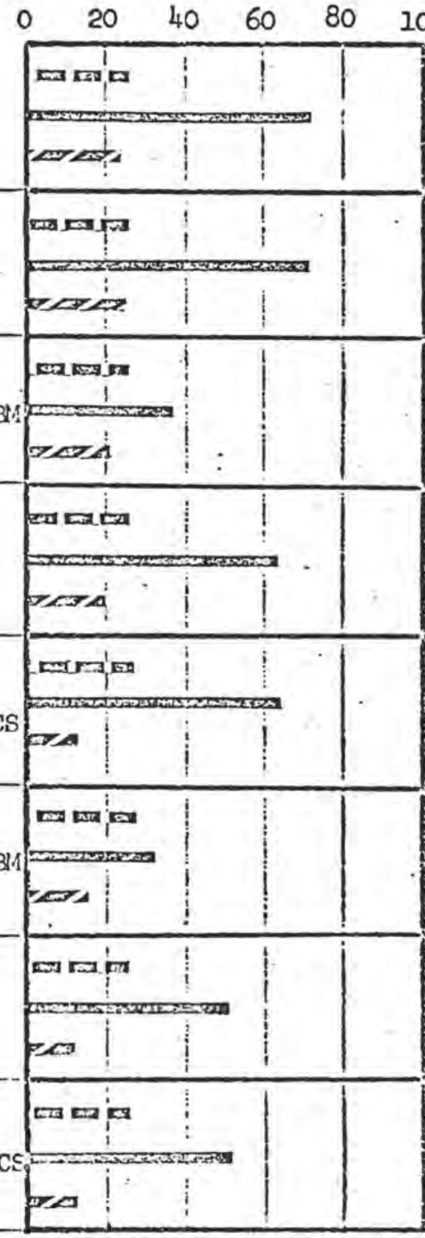
ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
180	169		Base Case	200	74	
591	510	1566	1000 Area Nationwide	886	347	1031
206	195	808	ABM Both Sides	27	24	651
328	282		Soviets: 1000 Terminal City ABM	236	46	
472	431	1566	US: 600 Mid-Course vs ICBM	1100	441	1031
113	97	808	400 Mid-Course vs SLBM	7	6	651
212	196		Soviets:	656	334	
0	0	1566	600 Mid-Course vs ICBM; 400 Mid-Course vs SLBM	2189	771	1031
0	0	808	US: 1000 Terminal City ABM	0	0	651

FIGURE 10-B

DECLASSIFIED

OPTION 4 — % DAMAGE TO SOVIET | ING | SOVIETS STRIKE FIRST — % DAMAGE TO US



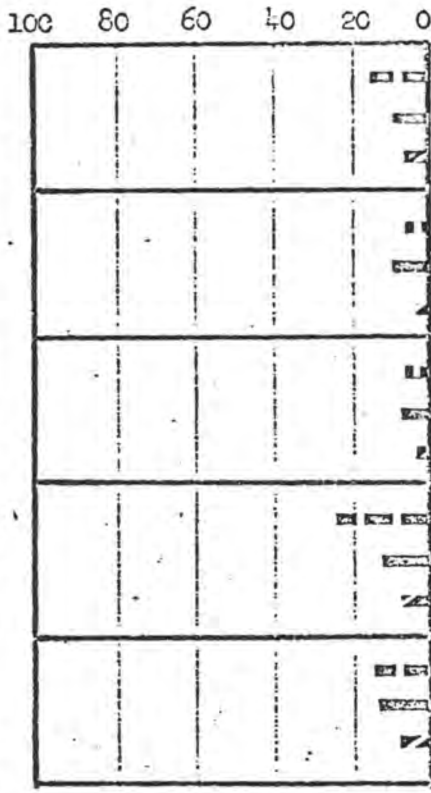
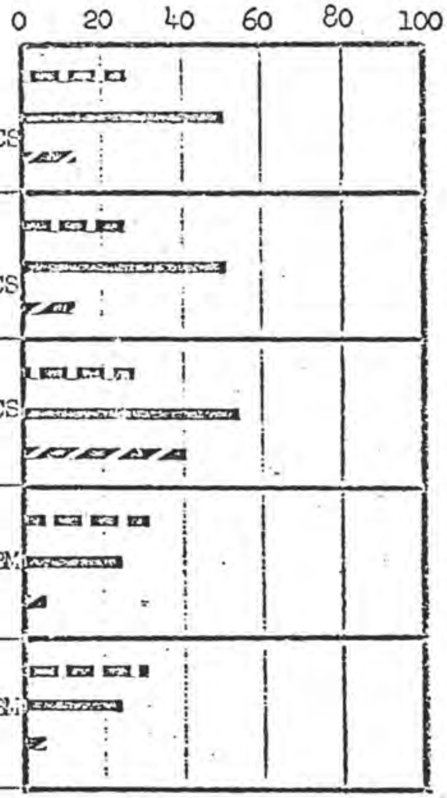


ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
171	161		Base Case	150	29	
330	297	1566	0 ABM	2587	978	1031
141	134	808		172	157	651
101	94		0 ABM	150	29	
294	264	1566	Soviets covertly add	2587	978	1031
89	84	808	200 MIDCS a/	172	157	651
124	118		0 ABM	119	53	
636	558	1566	Soviets covertly conv 680 ICBM	2029	416	1031
162	153	808	to terminal ABM	151	138	651
171	158		Base Case	163	39	
389	351	1566	200 ABM	2245	852	1031
142	135	808		141	129	651
102	92		200 ABM	163	39	
352	316	1566	Soviets covertly add 200 MIDCS	2245	852	1031
91	86	808		141	129	651
121	116		200 ABM	153	67	
659	584	1566	Soviets covertly conv 680 ICBM	1750	363	1031
162	153	808	to terminal ABM	112	102	651
191	177		Base Case	164	51	
435	385	1566	500 area ABM	1750	665	1031
170	163	808		97	88	651
151	139		500 area ABM	164	55	
432	382	1566	Soviets covertly add 100 MIDCS	1750	665	1031
134	127	808		97	88	651

POPULATION — HARD MILITARY — OTHER MILITARY

FIGURE 11-A

OPTION 4 — % DAMAGE TO SOVIET | SOVIETS STRIKE FIRST — % DAMAGE TO US

ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
112	102		500 area ABM	164	51	
428	379	1566	Soviets covertly add 200 MIDCS	1750	665	1031
97	93	808		97	88	651
35	29		500 area ABM	164	51	
418	370	1566	Soviets covertly add 400 MIDCS	1750	665	1031
26	25	808		97	88	651
35	29		500 area ABM	188	58	
385	341	1566	Soviets covertly add 400 MIDCS	1875	716	1031
26	25	808	and 400 mobile ICBMs	321	293	651
189	171		500 area ABM	258	115	
643	564	1566	Soviets covertly conv 680 ICBM	1283	260	1031
162	155	808	to area ABM	48	44	651
142	135		500 area ABM	258	115	
685	600	1566	Soviets covertly conv 680 ICBM	1283	260	1031
173	165	808	to terminal ABM	48	44	651

POPULATION — HARD MILITARY — OTHER MILITARY

a/ MIDCS denotes midcourse interceptors effective only against SLBMs in FIGS 11 and 12

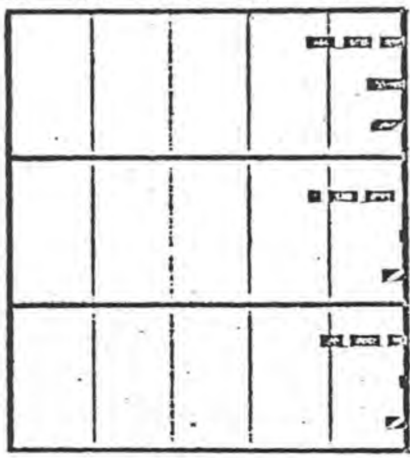
FIGURE 11-A (cont'd)

DECLASSIFIED

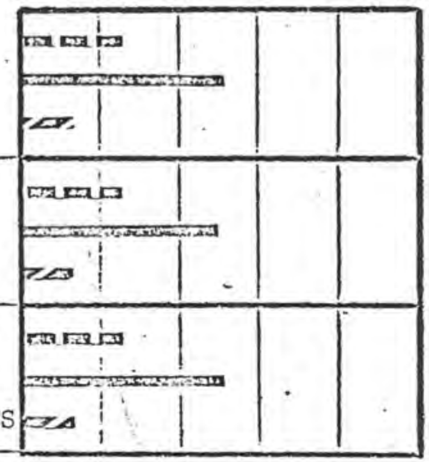
NO US MISSILE PENAIDS

OPTION 4 — SOVIETS STRIKE FIRST

% DAMAGE TO SOVIET



% DAMAGE TO US



ARR MTE	ARR R/V	NO. TGTS	DESCRIPTION	ARR MTE	ARR R/V	NO. TGTS
191	177		Base Case	164	51	
435	385	1566	500 area ABM	1750	665	1031
170	163	808	with PENAIDs	97	88	651
308	286		500 area ABM	175	51	
36	33	1566	no PENAIDs	1734	660	1031
83	76	808		102	93	651
240	223		500 area ABM	175	51	
32	30	1566	no PENAIDs	1734	660	1031
75	68	808	Soviets covertly add 100 MIDCS	102	93	651

POPULATION — HARD MILITARY — OTHER MILITARY

FIGURE 12-A

TAB I

ANALYTIC METHODS AND MODELS USED IN CALCULATING WAR-FIGHTING AND RETALIATORY CAPABILITIES

TAB I

ANALYTIC METHODS AND MODELS USED IN CALCULATING WAR-FIGHTING AND RETALIATORY CAPABILITIES

SCENARIOS

I. Retaliatory Capability Scenario

In calculating the retaliatory capability of U.S. forces, we measured their capacity to inflict damage upon the Soviet Union under the assumption that they had sustained a surprise Soviet first strike. We made the unlikely assumption that our forces are on day-to-day alert and the Soviet forces are fully generated. We assumed the Soviets launch their entire alert ICBM and SLBM force in a surprise counterforce attack which catches all our ICBMs and non-alert bombers on the ground and all our SSBNs which are not at sea at their tenders. The Soviet bombers were withheld from this first strike since the time from their detection to the time they reach their counterforce targets would be more than enough for U.S. missiles and bombers to be launched. The surviving U.S. forces then are launched at Soviet cities in a retaliatory second strike. The resulting damage to the Soviet Union is measured in terms of prompt fatalities and industrial damage. Since the purpose of this calculation is to evaluate our retaliatory capability we do not calculate U.S. fatalities. Similar assumptions were used in measuring the Soviet retaliatory capability.

II. War-fighting Scenario

In an actual war, the side striking first probably would use part of their strategic force against cities. To evaluate the damage limiting and war-fighting capabilities of the U.S. and Soviet forces, we used the following scenarios.

1. Soviet Union Strikes First - Both sides are on generated alert. The Soviets launch X% of their ICBMs and SLBMs in a counterforce attack against the U.S. strategic offensive forces. This attack is made so as to minimize the damage that the surviving U.S. weapons could inflict upon Soviet cities. All the surviving U.S. forces strike Soviet cities in retaliation. Finally, the Soviets strike U.S. cities with all their bombers and the missiles withheld from their first strike. As X varies from 0% to 100% counterforce, the resulting fatalities to both sides generate a curve which is a measure of the war-fighting and damage limiting capabilities of the U.S. forces.

2. United States Strikes First - Both sides are on generated alert. The United States launches X% of their ICBMs and SLBMs in a counterforce attack against the Soviet strategic offensive forces. This attack is made so as to minimize the damage that the surviving Soviet weapons could inflict on U.S. cities. All the surviving Soviet forces then strike U.S. cities in retaliation. Finally, the United States strikes Soviet cities with all their bombers and with the missiles withheld from their first strike. As X varies from 0% to 100% counterforce, the resulting fatalities

to both sides generate a curve which is a measure of the war-fighting capability of the U.S. forces. This curve, together with the curve obtained when the Soviets strike first, is also a measure of the damage limiting capability of offensive forces.

A point of particular interest on these war-fighting curves is the maximum delta point. This point represents the mixture of counterforce and countervalue effort which maximizes the difference in fatalities between the side striking second and the side striking first. If the side striking first gives equal utility to fatalities on either side, then this point is the optimal allocation of the first strike when fatalities are the only measure of effectiveness.

In all scenarios we withheld 65 B-52s and 128 Polaris SLBMs for targets in China.

ALLOCATION TECHNIQUE

We used two computer models in our analysis, Code 50 and the Arsenal Exchange Model (AEM). Both are strategic force exchange models which allow multiple strikes, targeting of weapons on urban-industrial complexes, bomber defenses, and ABM defenses.

The technique for allocating weapons in both models is the same. This technique makes use of Everett's method of generalized Lagrange multipliers to find a weapon allocation which maximizes value destroyed. In an attack on urban-industrial complexes, we used population as the measure of value. In a counterforce attack, the objective is to minimize the urban-industrial damage which the other side can inflict in a retaliatory strike. AEM achieves this objective by iterating the counterforce/retaliatory strike sequence until the urban-industrial damage to the side striking first is actually minimized.

Code 50 does not presently have this capability. Instead, a value is assigned to each weapon which is a measure of its effectiveness against cities. The counterforce strike is then allocated so as to maximize the total weapon value destroyed. Weapon value as a target is computed by the following formula, which takes penetration capability as well as warhead yield into account:

$$\text{Weapon Value} = \frac{(\text{Number of warheads}) \times (\text{equivalent megatons per warhead}) \times (\text{area aim points} + \text{terminal aim points})}{2}$$

Equivalent megatons is a measure of the capability of a warhead for urban-industrial damage. It is computed by raising yield in megatons to the two-thirds power for warheads less than one megaton and by taking the square root of the yield for warheads greater than one megaton.

DAMAGE ASSESSMENT

U.S. and Soviet fatalities are calculated from a 1978 data base supplied by the National Military Command System Support Center (NMCSSC).

There are 144 million U.S. people in 466 cities in the data base. This is 61.3% of the total 1978 U.S. population of 235 million and includes all U.S. cities with population greater than 23,000. In the Sŏviet data base there are 137 million people in 2151 cities. This is 50.9% of the total 1978 Soviet population of 269 million and includes all Soviet cities with population greater than 5000 and many of those with a population of 1000-5000.

When calculating the U.S. retaliatory capability, we were conservative and assumed that a 10 psi overpressure is required for destruction of Soviet cities. Moreover, since the Soviets were assumed to be generated in the retaliatory scenario, we assumed that most of their urban population was sheltered from fallout and assessed their fatalities based only on prompt effects from air burst weapons. These fatalities were calculated in Code 50 with a square root damage law.

For war-fighting calculations we were less conservative and assumed that an 8 psi overpressure is sufficient for severe damage to cities of either side. Again, since both sides were assumed to be generated in the war-fighting scenarios, we assessed only prompt fatalities.

Industrial damage was not computed in either Code 50 or AEM. Instead, we used Soviet industrial damage response data provided by NMCSSC to correlate industrial damage with prompt fatalities. The following table shows this correlation as computed for the 1978 Soviet population data base.

Table I-1

RELATION BETWEEN DELIVERED EMT, FATALITIES AND INDUSTRIAL DAMAGE

Delivered U.S. 1MT Warheads	% Soviet Fatalities	% Industrial Capacity a/ Destroyed
100	16	32
200	24	44
400	32	56
800	40	66
1200	44	70
1600	45	70

a/ Manufacturing Value Added (MVA).

ABM DEFENSES

We assumed that Soviet area defenses defend all urban and military targets, so they cannot be by-passed. Local defenses deployed around a city can defend that city only.

Soviet area defenses were represented by a random defense model. The defense might be able to do better by pre-committing interceptors to specific targets and keeping that pre-commitment unknown to us. However, against a mixed bomber/missile attack where the defense does not know which targets will be attacked by bombers, such a pre-commitment can be less effective than a random defense.

We assumed that if a Soviet terminal interceptor fails, another can be reprogrammed against the same incoming warhead; thus, to penetrate we must exhaust the supply of reliable terminal interceptors (75% of inventory).

We cannot use current intelligence to project the deployment of Soviet terminal defenses for the next ten years. In our calculations, local ballistic missile defenses are deployed to the largest Soviet cities in proportion to population. We determine the number of cities which are defended by constraining the minimum ABM defense of a city to 20 interceptors.

U.S. ABM firing doctrine is based upon replacement of launch failures rather than firing multiple interceptors at the same time at the same target. We assume 85% of the deployed interceptor inventory is effective in accomplishing intercept and kill. Area ABM defense effectiveness is based on a random intercept of area aim points. We assumed that the area ABMs defend both military and urban targets. Terminal ABM effectiveness is based upon the sequential intercept of terminal aim points. The battery will engage each threatening object until exhaustion (85% of the inventory).

The Sea-based Anti-Ballistic Missile System (SABMIS) was modelled as a forward-based system capable of intercepting ICBMs in the middle portion of their ballistic trajectory, before their RVs or penetration aids are fully deployed. We assumed that only half of the area objects were presented as aim points to the forward-based SABMIS. SLBMs cannot be intercepted by a forward-based SABMIS. Other SABMIS ships were assumed to be deployed where they could intercept SLBMs (but not ICBMs) in their boost phase, before deployment of their RVs or penetration aids. In both cases, we used a random nationwide intercept model and assumed that the SABMIS ships were not attrited by a submarine or bomber attack.

AIR DEFENSES

The Air Force Bomber Penetration Study was used to determine the effectiveness of U.S. bombers and penetration aids against different Soviet interceptors. We assumed that each type of Soviet interceptor is brought to bear against the whole penetrating force and that the Soviets do not preferentially attack any one type of bomber; e.g., if the Soviets have three types of interceptors, the probability of a bomber penetrating these defenses is the product of its probability of penetrating against each type of interceptor. Soviet SAMs used as area defense were considered to have no effectiveness against low altitude penetrations.

Based on NIPP estimates, we assumed the Soviets have two types of effective terminal bomber defenses deployed around their larger cities, the SA-Z-1 and SA-Z-4 (a SAM-D class of interceptor). The currently deployed SAMs (SA-1, SA-2, and SA-3) are estimated by the NIPP to have little capability against low-level aircraft attacks.

The SA-Z-1 cannot intercept a SRAM and therefore can be suppressed with SRAMs. One-fourth of the operational sites around any given city must be suppressed, each with a kill probability of 0.95, before the city can be attacked with SRAMs. SCADs can be used to exhaust an SA-Z-1 site, provided nine reliable SCADs are targeted to that site. If the SA-Z-1 site is not suppressed or exhausted, it has a unit kill probability against each bomber attacking the city prior to weapon release.

Since the SA-Z-4s are assumed able to intercept SRAMs, they must be exhausted with SCADs or SRAMs. In order to exhaust the battery, the number of SCADs or SRAMs shot at each SA-Z-4 defended city must equal one-half the simultaneous target-handling capability of the SA-Z-4 sites deployed at that city, since not all of the sites are capable of engaging all the SCADs and SRAMs due to range limitations. If the SA-Z-4 site is not exhausted, it has a kill probability of 1.0 against bombers prior to weapon release.

Penetration probabilities for Soviet bombers and Air-to-Surface Missiles (ASMs) engaged by the U.S. air defense system were computed external to the programs and used as input data.

SOME LIMITATIONS

The damage criterion used in all these calculations is the prompt fatalities due to overpressure. It is assumed that the weapons are detonated at an optimum height in order to maximize this damage. Even assuming such air bursts, however, this criterion neglects the damage and fatalities which would be expected to result from other effects such as direct nuclear and thermal radiation, fire storms, fallout, epidemics and starvation. Thus, this assumption tends to underestimate the resulting fatalities.

In those calculations involving ballistic missile defenses the area interceptors are modeled as a random defense and each interceptor is assumed to have a range sufficient to engage any weapon which threatens the nation, regardless of where it is deployed. These models also neglect the possibility of using tactics such as attacks on radars by SLBMs and the use of precursor nuclear bursts to blackout the radars. Consequently, these assumptions cause an overestimation of the capabilities of the ABM defenses.

It was assumed in the calculations that the Soviets did not employ penaids in either their pre-emptive or retaliatory attack, because such a capability was not credited them in the CIA force posture estimates. However, if the U.S. deployed an extensive BMD capability, there would be a strong incentive for the Soviets to develop and deploy area penaids.

In the computer models used, all attacks were optimized to achieve maximum damage using the Generalized Lagrange Multiplier technique developed by Dr. Hugh Everet. Thus, the initial counterforce attacks were programmed to minimize the damage that the surviving weapons could do in their retaliatory attacks and the countervalue attacks were programmed to maximize the damage which could be done to the urban/industrial base of the nation. It is doubtful that actual targeting would be done according to the schemes used in the models.

Finally, in all cases the results are dependent on the imput data such as weapon CEPs, reliabilities, target hardness, etc. For the highly complex systems considered, it would be surprising indeed that the estimates used for these parameters were precisely corrected.

In spite of the limitations discussed above, and others not specifically mentioned, the models and assumptions used are believed to be sufficiently descriptive of the real world to enable one to use the results as approximate indicators of magnitudes of damage and to reveal trends which could be expected as postures change.

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ANNEX B

VERIFICATION OF POSSIBLE ALTERNATIVE OPTIONS FOR STRATEGIC ARMS LIMITATION TALKS

Refer to the following:

1. SNIE 11-13-69;

2. Summary Report of the Verification Panel, "Verification of Possible Alternative Options for Strategic Arms Limitation Talks", dated May 1969; and

3. Code-word version of the Verification Panel Report, TCS-4228/69G, dated May 1969.

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REPORT OF THE

INTERAGENCY WORKING GROUP FOR

NATIONAL SECURITY STUDY MEMORANDUM 28

ANNEX B:

VERIFICATION OF POSSIBLE ALTERNATIVE OPTIONS FOR STRATEGIC ARMS LIMITATION TALKS

SUMMARY OF THE REPORT

OF THE VERIFICATION PANEL

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TS-199023B
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TS-199023B
26 May 1969

Verification of Possible Alternative Options for Strategic Arms Limitation Talks (NSSM-28)

Conclusion of an arms control agreement would probably signify that the Soviets had decided to accept, at least for a time, the limitations imposed by such an agreement. Therefore, if the Soviets should employ concealment and deception to violate the agreement, we believe that their aim would be to alter the strategic balance. Any smaller stakes would hardly justify the risk. In such a case, we believe that we would almost certainly detect activities leading to a major change in Soviet strategic capabilities from those estimated or acknowledged at the time of the agreement.

Although it is highly unlikely that any large-scale new deployment of their strategic forces could go undetected, the Soviets could effect minor increases without our detection. And with extensive deception and concealment, they could degrade our intelligence capabilities. Detection and identification of the nature of the deployment would probably come later than in normal circumstances. However, in such a case the probability of the detection of at least one of a number of minor violations would be greater than that of detecting a violation of a single provision of the agreement.

Note: This document summarizes the report (TCS-4228/69G) prepared by the Verification Panel of the NSSM-28 Working Group and disseminated on 26 May 1969. This panel included representatives of the Department of State, the Arms Control and Disarmament Agency, the Defense Intelligence Agency, the Joint Chiefs of Staff, and the Central Intelligence Agency. The report is an assessment of our capabilities to verify Soviet compliance with an arms control agreement now and for the next five years or so. It should be read in conjunction with SNIE 11-13-69, US Intelligence Capabilities to Monitor Certain Limitations on Soviet Strategic Weapons Programs *(TCS-1043-69, TOP SECRET/Controlled Dissem/Limited Distribution).*

The foregoing presumes that the Soviets will not directly interfere with the effective operation of our unilateral collection sources. We believe that they will refrain from interfering, both because of the possibility of US reaction against their own operations and out of concern for the general political problems which such interference might produce.

In assessing the verification tasks, we have separated the general conclusions into three broad categories. These are summarized in the following paragraphs.

High Confidence of Verification

We have high confidence in our unilateral capabilities to verify within close tolerances a limit on fixed strategic offensive and defensive launchers. The deployment of present ICBM systems at soft MR/IRBM sites probably would be detected. We are equally confident in our abilities to monitor a limit on the number of submarines and launchers of both the ballistic and cruise type. We would have a good chance of detecting the construction of surface ships equipped to launch strategic missiles, or the testing of the system at sea. We have high confidence of verifying the number of ABM launchers. The possibility of clandestine evasion of a limit on ABM launchers or preparations for evasion would be decreased if radars were limited and mobile launchers were banned. If a SAM system were converted to an ABM system, such extensive changes would be required that some would almost certainly be detected and probably would be identified as such before their initial operational capability (IOC). We believe that any significant improvements to ICBMs--such as MIRVs--would involve full-system flight testing to ICBM range. Our unilateral capabilities provide us with high confidence that we would detect the testing of MIRVs and other special re-entry systems for ICBMs before IOC.

Lesser Confidence of Verification

We have lesser confidence in our unilateral capabilities to monitor a ban or limitation of the deployment of land-mobile offensive and defensive strategic systems. In the case of land-mobile offensive systems, we believe that we would be able to identify the system, but perhaps only when it had become operational in substantial numbers. In addition, it would be extremely difficult, if not impossible, to make any precise determination of the number of mobile weapons in such a force, although we think that we would be able to estimate the general magnitude of the deployment. In the case of development of MIRVs for MR/IRBMs, detection would probably occur late in the test program, and possibly not until the system was tested to full range. The chances of our detection of MIRV testing for SLBMs are only about even. If ABM radars and launchers were limited, but mobile launchers were not banned, we would be less confident that the agreement could be verified.

Low Confidence of Verification

We have little or no confidence in our unilateral capabilities to determine the extent to which MIRVs (if developed and flight tested), MRVs, or special re-entry systems (FOBs, MOBs, DICBMs, RICBMs, and MaRVs) had been deployed at offensive missile sites. We might not be able to detect the deployment of ICBMs in MR/IRBM silos. If ABM radars were unlimited and additional ABM radars were actually built by the Soviets as part of a contingency hedge, we would have confidence in detection of ABM launchers if they were constructed but intelligence warning time would be reduced to a year or two prior to full operational capability of the system. Some modifications to give a SAM system a limited ABM capability (e.g. point-in-space intercept) might be difficult to detect or could escape detection completely.

Other Verification Considerations

Any agreement which permits a mix of sea- or land-based mobile and fixed offensive launchers within a specified ceiling would seriously complicate the verification problem, the more complicating factor being the land-based mobile system. A related problem involves verifying that excess launchers, declared inactive, are in fact not operable. Unless specific provisions were made in the agreement concerning procedures for the deactivation and activation of launchers, it would be difficult to verify that a launcher had been deactivated or to determine when a replacement launcher achieved operational status.

Adjuncts to Means of Unilateral Verification

Our unilateral collection capability could possibly be enhanced by supplemental arrangements. For instance, an agreement to pre-announce all strategic and space firings and to limit them to agreed ranges would facilitate and extend our collection coverage. In particular, such an arrangement would improve our ability to verify a prohibition on flight testing of specialized re-entry systems.

In certain cases more intrusive measures, such as an agreement for selective direct observation (SDO), could contribute to our total verification process. The more significant application would relate to bans on upgrading the SA-5 air defense system to an ABM system, the retrofit of IR/MRBM silos with ICBMs, the destruction of replaced missile silos, and the status of decommissioned submarines.

The table on pages 7-9 summarizes, by level of confidence, the items that could be identified for the various strategic weapon systems.

Verification of the Proposed Options*

The study of verification by national means of the provisions of each of the four alternative

** The assessment on the options provided here does not include ABM because the force levels are as yet unspecified within the options.*

options, has led to the following observations. We assume that Soviet violations would be accompanied by attempts at concealment and deception.

Option I

Since this option concerns only fixed and mobile land-based strategic offensive missile launchers, it could be verified with high confidence provided there were clearly defined procedures for silo replacement. Without such procedures, replaced silos could not be verified as inoperable. Other than this, the major difficulty would be some uncertainty in verifying a ban on land-mobile strategic missiles. Under this option, for example, it is possible, although unlikely, that a Soviet attempt to build a force of 200 to 300 land-based mobile strategic launchers could go undetected for two to three years.

Option II

While the basic option would be verifiable, there would be a considerably lower level of confidence than in the case of Option I. The chief difficulty with this option would be the verification of the permitted mix of mobile ICBMs together with fixed (relocatable) launchers. The verification problem would be further complicated by the restriction on the number of SLBM launchers without a concomitant restriction on the number of submarines. Regarding replacement of fixed land-based and sea-based launchers, the verification complexities could be mitigated through clearly defined procedures for launcher replacement. There would be far greater difficulty in detecting a violation in a mixed ICBM force than would be the case if mobile ICBMs were banned. The variant to this option, which allows an interchange of land- and sea-based launchers, would further complicate this verification problem by extending the above weapons launchers mix.

Option III

The basic option could be verified with high confidence. It minimizes the difficulties of Options

I and II by prohibiting land-based mobile strategic launchers, the replacement of fixed silos, and further construction of SLBM launchers or submarines. The most difficult task in this option would be verifying the ban on land-mobile strategic launchers, the uncertainties surrounding which would be the same as in Option I.

The two variants to this option would increase the verification difficulty owing to the land- and sea-based launcher mix and superhardening provisions. Despite the verification complexities, we still have high confidence of determining the eventual force levels in a mix of fixed land-based and sea-based launchers as would be permissible under Variant III-B. Accordingly, the launcher mix in Variant III-B would be easier to verify than that in Variant II-A because it excludes a land-mobile system as part of land- and sea-based launchers. The difficulty of verifying the first variant (superhardening) is the same as that associated with launcher relocation and would be mitigated by clearly defined procedures for launcher replacement.

Option IV

The only differences from Option III* are bans on testing and deployment of MIRVs and the further flight testing of all other specified re-entry systems. Our capability to verify the testing of these re-entry systems at present is good and should improve during the period under consideration. Even with present verification systems, we have confidence of timely detection of MIRV testing for ICBMs and a somewhat lesser level of confidence regarding shorter range missiles. The chances are only about even that we would detect the testing of MIRVs for SLBMs. At present Option IV, as it applies to MIRVed ICBMs, could be verified with high confidence. If the Soviets complete RDT&E of a MIRV system prior to an agreement, verification of a ban on actual deployment of MIRVs would be difficult, if not impossible, by national means.

* *As noted above, Option III could be verified with high confidence.*

Table 1
Confidence Levels of Timely Identification of Limited Weapon System Items

System Limited	High	Lesser	Low
ICBM	Additional fixed launchers Flight test program	Mobile launchers	Accurate estimation of mobile launcher levels
MR/IRBM	Additional fixed launchers Deployment of present ICBMs to MR/IRBM soft sites Flight test program	Mobile launchers	Deployment of ICBMs to MR/IRBM silos Accurate estimation of mobile launcher levels
Submarine	Number of units and launchers Replacement with identifiable destruction	Number and location of flight tests Replacement with mothballing	
ABM	Fixed ABM launchers Sea-based ABM launchers ABM radars Long-range interceptor flight tests	Land-mobile ABM launchers	Accurate estimate of mobile ABM launcher levels Short-range interceptor flight test without new collection system

Note: This table is based on our present capabilities. The confidence levels are defined as follows:

High: High confidence of detecting the relevant activity prior to IOC or before substantial deployment.

Lesser: Confident of detecting the relevant activity but possibly not until substantial deployment had occurred.

Low: Detection of the relevant activity cannot be assured or intelligence warning time of the activity could be short.

Table 1
(continued)
Confidence Levels of Timely Identification of Limited Weapon System Items

System Limited	High	Lesser	Low
SAM upgrading	Conversion to ABM		Minor upgrading for point in space intercept
MIRV and special re-entry systems	Development flight testing for ICBMs	Development flight testing for MR/IRBMs and SLBMs	Deployment
Surface ships	Outfitting for strategic missiles System testing at sea		
Fixed-mobile force mix	Fixed land-based and sea-based launcher levels	Fixed and mobile land-based launcher levels	Fixed and mobile land-based and sea-based launcher levels
Launcher replacement	Number of launchers if destruction identifiable		Number of launchers if destruction not identifiable
Test range	New construction or location		

Table 1
(continued)
Confidence Levels of Timely Identification of Limited Weapon System Items

System Limited*	High	Lesser	Low
ASW units	Numbers and types of ASW vessels and aircraft Long-range, fixed submarine-detection systems		
Bombers	Additional strategic bombers Bomber and ASM development program	Type of bombers if hangars constructed Deployment of extended-range ASM	
Air defense units	Order-of-battle of fixed defensive missiles, fighter aircraft and radars Prototype of new defensive missile system	Capabilities of new defensive missile system prior to IOC	
Betas, payload weights, and CEP improvements	Significant changes in these parameters		

* *The systems listed on this page are not now part of the specific options, but have been added here for convenience and comparison. A discussion of intelligence capabilities related to these systems is provided in section II-B, pp. 29-32.*

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NSSM-28 - FOREIGN POLICY CONSIDERATIONS

I. Soviet Reactions to Negotiations and Agreement

A. Initiation of Negotiations

1. The primary conclusion the Soviets would draw from the initiation of strategic arms limitation talks (SALT) would be that the Nixon Administration is serious in its declared intent to enter an era of negotiations with the USSR. This impact would not necessarily make the Soviets more forthcoming in substance in other problem areas, but could create a more conducive atmosphere where negotiations were involved, especially those in which the USSR is a direct participant.

2. A US decision not to enter negotiations, under present conditions, would produce more clear-cut Soviet reactions. The Soviets must recognize, and believe that we do too, that the strategic arms competition between the US and USSR represents a very serious problem which directly concerns both countries. A US decision not to enter SALT, especially given the background of persistent US advocacy of SALT in the past, could leave the Soviets with the impression that the US not only was not interested in negotiated settlements, but was girding itself for a period of sharper contests with the USSR. The result could be a certain hardening of the Soviet foreign policy line.

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3. The Soviets, under conditions of negotiation, almost certainly would reject any explicit linkage of SALT with other political issues which tied their hands or indicated concessions on their part on these issues. They would argue, as they do now, that an arms limitation agreement of this portent is of great importance and that both sides have an equal stake in its successful outcome.

4. The Soviets might attempt to exploit the initiation of negotiations in Eastern Europe and elsewhere by citing it as evidence of US acquiescence in Soviet-style "normalization" in the area. Depending upon how adroit the Soviets are this could make it more difficult for the US effectively to continue to emphasize displeasure and concern over the Soviet action in Czechoslovakia. However, barring failure of the US to react to a major new blow-up in Czechoslovakia, it is doubtful that the Soviets would be entirely successful in this endeavor. The Czechoslovaks themselves, as well as the Romanians, apparently are convinced that, other factors being equal, they have a better chance of escaping or withstanding Soviet pressures under conditions connoting a lessening of East-West tensions.

5. The Soviets would be prepared to face the almost inevitable Chinese Communist charges that the initiation of SALT provided further evidence of Soviet revisionism and US-Soviet collusion against Communist China. The Soviet leaders would probably calculate, and welcome the fact, that SALT might make even more remote, than is presently the case, the lessening of Chinese Communist intransigence toward the US.

B. Likely Soviet Negotiating Tactics

6. Soviet Motives - The present Soviet interest in arms limitation talks appears to reflect a combination of strategic and economic considerations. After close to a

decade of effort and expense, the Soviets have recently surpassed the US in the number of deployed ICBMs and are well along with a SLBM program which in time could produce comparable results. Despite a continuing deficiency in bombers, they can thus for the first time negotiate from a position of rough parity in strategic forces and have their status as the strategic equal of the US openly acknowledged, a factor which they would seek to exploit politically.

7. At the same time, the USSR faces the danger of having the US move ahead again as a result of both planned improvements in US forces and possible further US reaction to the Soviet build-up in the form of additional programs. At this stage, the Soviets would probably find such an erosion of their present position to be intolerable. Arms control would offer a possible means of averting such a development. The alternative would be a new round of heavy expenditures on strategic forces--an outcome which would hurt not only on civilian investment and production but also competing military programs such as those for refurbishing and enlarging general purpose forces. Moreover, the Soviets may be concerned that, with the end of the Vietnam war, major additional resources will become available to the US for possible expenditures on strategic forces. In addition, the Soviets would have doubts of their ability to match the US over the whole range of technological development for more advanced systems.

8. The importance of these considerations to elements in the leadership varies. Some probably have grave reservations about the possibility of obtaining a satisfactory agreement with the US and are committed only to exploring the possibilities. Some may even view talks merely as a means of delaying the introduction of new US strategic weapons systems; some elements in the military apparently have never accepted the idea of arms limitations and are continuing to oppose it. However, on the basis of

Soviet acceptance and promotion of SALT, there is reason to believe that the present consensus in the leadership favors and looks to SALT as a means of achieving a strategic arms limitation agreement.

9. General Objectives - The Soviets would strive for an agreement which, at a minimum, gave them continued rough parity with the US (however they may calculate it), preserved their ability to inflict unacceptable retaliatory damage on the US, limited US capabilities to inflict damage on the USSR, and offered the prospect of avoiding increased levels of expenditures. If they believe it possible to obtain an agreement that would assure a degree of superiority over the US they would doubtless prefer it, but there is no reason to believe that they think this is feasible. That they may, as a matter of tactics if nothing else, see how far they can go in this direction should not be discounted.

10. As a negotiating tactic, and possibly as a maximum objective, they probably would choose to ignore asymmetries in strategic weapons in which they have an advantage (ICBMs, IR/MRBMs) and argue for US-Soviet parity in those weapons systems in which the US is ahead (SLBMs, possibly strategic aircraft). However, this estimate of an initial tough negotiating stance may be misleading, as some signs point to a Soviet willingness to accommodate. Moscow seems genuinely interested in reaching some sort of an agreement--which would inevitably involve compromises on both sides. Moreover, the Soviets over the past year have accepted the US proposition that the first aim of SALT would be an agreement on limiting, not reducing, strategic arms. This implies a willingness to stabilize arms on both sides at roughly present levels, perhaps with allowances for an agreed limit on ABMs. If true, this in turn implies Soviet willingness to accept present asymmetries in US-Soviet strategic forces, rather than to demand numerical parity in all of the components of these forces, and satisfaction that the build-up of Soviet offensive strategic forces has brought the Soviet Union sufficiently close to the US to

consider a halt in the strategic arms race. Nevertheless, past experience in negotiating with the Soviets indicates that they will initially try for the most advantageous position possible in an attempt to make subsequent minor concessions appear significant.

11. For propaganda purposes at least, the Soviets will probably insist on couching arms limitation talks, and an eventual agreement, in terms of being a first step towards a mutual reduction of strategic arms. They may even view a reduction as a desirable long-term goal. However, it is not believed that they will demand a firm commitment to undertake subsequent reductions as a precondition to an agreement. Their initial negotiating position may not include proposals for reductions, though one directed at reducing aircraft is a distinct possibility.

12. Little is known of Soviet views concerning the preferred scope of a strategic arms limitation agreement, except that it should apply to both offensive strategic delivery vehicles and ABMs. The Soviets would presumably favor an agreement of broad application, rather than one which could prove to be unviable by permitting large loopholes for continuation of the strategic arms race in non-restricted fields. However, the Soviet position on a given restriction or loophole would depend primarily on the Soviet assessment of its relative impact on US-Soviet strategic forces. Thus, we cannot exclude the possibility that the Soviets would find a narrow agreement acceptable.

13. There is also little concrete to go on in judging Soviet views on the desirability of maintaining a stable mutual deterrence. They obviously want to maintain an effective deterrent against a US first strike. While some in the government--presumably the feeling is strongest among the generals--might desire in theory a first-strike capability, we have no evidence from Soviet public or classified statements that they believe this is a feasible course. We would assume that they must recognize the

futility of pursuing this goal, given the present stage of the US-Soviet strategic relationship and the action-reaction characteristic of the competition in the strategic arms.

14. There is no way of judging exactly how the Soviets measure a state of deterrence, and hence the impact of new weapons systems on mutual deterrence. However, the Soviets probably recognize the theoretical possibility of developing new weapons systems to such a degree that they would erode mutual deterrence and give either or both sides a first-strike capability.

15. US-Soviet diplomatic exchanges on SALT have clearly specified bilateral talks and the Soviets have clearly accepted this principle from the beginning. This would indicate that the Soviets do not envisage any agreement which would place limitations on British and French strategic nuclear forces. As a bargaining device, however, they may argue that the British and French forces should be taken into account in calculating the forces available to the two sides. They may raise the question of British and French forces as a counter-argument to a US proposal to freeze the deployment of Soviet IR/MRBMs. It is somewhat less clear how they will react to US theater nuclear forces. They may attempt to blanket these forces into the discussion, especially since they have not in the past made as sharp a delineation between classes of nuclear weapons as the US has seeing them all as applicable to general strategic nuclear war.

16. While the Soviets have a multitude of anxieties about Communist China, it is doubtful that the prospective development of a Chinese nuclear delivery capability will affect significantly the Soviet negotiating position in regard to offensive systems. However, the Soviets will undoubtedly wish to maintain the option to deploy offensive ballistic missiles against China. The impact of the China question on the Soviet attitude toward defensive systems is not entirely clear. The Soviets have not demonstrated the same concern

as we have about building an ABM system to cope with the Chinese threat of the next decade, but this would be one reason the Soviets might wish to have an ABM force.

17. Soviet Views in Regard to Key Issues - At least in the initial phase of talks, the Soviet negotiators could be expected to set forth positions which protected weapons systems where the Soviets enjoy an advantage, narrow or close the gap where the US is ahead in deployed weapons, and inhibit technological developments in which the US has the lead. Indeed, the Soviets would be likely to regard almost any US proposal as an "opener" and would attempt, through criticism or counterproposal, to whittle down alleged or real advantages accruing to the US.

18. Beyond initial debating points, it is difficult to say with any certainty what would be the final Soviet position on an overall package. Much would depend on the "mix" of the package, as well as on the dynamics of the negotiations. In the following discussion of particular issues, the stress, accordingly, has been placed on likely initial Soviet response to US proposals.

a. Verification - Moscow almost certainly would insist on exclusive reliance on national means of verification in any agreement and would oppose proposals for even limited on-site inspection. This judgment is based on the past record of Soviet opposition to on-site inspection on Soviet territory; the effectiveness of national means of verification, which we have indirectly acknowledged in our own communications to the Soviets (we have said that the US is prepared to place "maximum reliance on national means of verification"); and the fact that on-site inspections would be most effectively applied to check on possible qualitative changes in Soviet weaponry, concerning which the Soviets be most sensitive. It is conceivable that the Soviets would accept token on-site inspection if this were the only obstacle standing between them and an agreement which they considered highly favorable. But this possibility seems remote. The Soviets might, however, respond favorably to a proposal to establish a joint commission to examine complaints and adjudicate differences stemming from the agreement; out of such an arrangement could arise the possibility of informal, not institutionalized, on-site inspections.

b. Moratorium - One of the most difficult negotiating points would be to gain Soviet acceptance of our proposal (a key element in all options) that, under the terms of an agreement, both sides should cease the initiation of the construction of offensive strategic missile launchers as of a given date (July 1) coterminous, or nearly so, with the initiation of talks. They would view this as a US effort to halt the current build-up of Soviet offensive strategic forces without offering the USSR any assurance that a final balanced agreement could be reached. They would probably argue that a cut-off proposal, if acceptable on other grounds (e.g., the disparity of SLBM forces), should set a date coterminous with the successful completion of talks. They might couple this argument with an offer to slow down deployment rates.

The Soviets might have an incentive to accept the US approach outlined above, if the US were willing to introduce an immediate moratorium on MIRV flight testing. If they were anxious to stop MIRV development and were willing to accept the risk involved in our testing leadership, a test moratorium might be an incentive sufficient to overcome Soviet objections to a moratorium affecting their programs.

c. ICBMs (fixed) - Since they have recently surpassed the US in total numbers of ICBM launchers deployed and under construction, it should be possible to induce the Soviets to accept a "freeze" on the deployment and further construction of fixed land-based ICBMs, as of a given date, provided that satisfactory agreement on other elements of an overall agreement were reached. (Options III and IV.)

One immediate problem is that Soviet ICBMs are deployed in groups of six in the case of the SS-9 and groups of ten in the case of the SS-11 and SS-13. The Soviets would almost certainly demand that they be allowed to fill out groups under construction even where all silos had not been started by the cut-off date. (At this time, this would involve only a small number of ICBMs.)

The Soviets would see some attraction in the provision to permit replacement of ICBM launchers on a one-to-one basis (Options I and II, Variant III A) in that it would permit them to replace their older, "soft," ICBMs (over 10 percent of their present ICBM force) with new ICBMs in hardened silos. On balance, however, they are more likely to oppose this proposal. They would be suspicious of US intentions in advocating this loophole in a strategic arms limitation agreement, being aware of US studies of new, superior ICM's. They might believe, and contend, that this proposal would permit a continuing and costly competition in strategic missiles under the sanction of an agreement.

The Soviet reaction to a proposal to freeze merely the sum of ICBM and SLBM launchers (Variants III B and II A) would be much the same. They would perceive some advantage in being permitted to build additional missile-launching submarines in exchange for the vulnerable "soft" ICBMs. But their concern about the uncertainties and potential costs of leaving the missile competition open-ended in this manner would probably be overriding.

d. IR/MRBMs (fixed) - In response to the proposal to freeze the deployment of IR/MRBMs (all options), the Soviets probably would initially argue that these weapons should not be limited by the agreement. They would probably maintain that these weapons are part of the USSR's European theater forces and might even argue that they are not strategic weapons. Alternatively, or successively, the Soviets might take the view that an agreement covering Soviet

IR/MRBMs should also deal with American, British, and French nuclear weapons in Europe, including Pershing missiles, which by our definition (a range greater than 1,000 km) are not MRBMs.

Either approach would, of course, raise serious problems for the US, particularly with our NATO Allies. However, it seems unlikely that this question would be one on which the Soviets would insist on having their way to the point of preventing an otherwise desirable agreement.

e. Mobile ICBMs and IR/MRBMs - The Soviet Union has placed considerable emphasis on the development of mobile land-based strategic missiles. It has already tested (though not deployed) a mobile MRBM which will probably have a 1,500 nm range, appears to be developing another mobile IRBM of up to 3,500 nm range, and is expected to develop a mobile system of full ICBM range within the next few years. The Soviets could be expected, initially at least, to argue strongly against a total ban on land-based strategic mobiles, as would be proposed under Options IV, III, and I, especially since they know the US does not have a comparable system and might not deploy one even if the Soviets continue with their own deployment. The Soviets might argue that a disparity in SLBMs should be made up with their mobile IRBMs and ICBMs, since the systems have mobility in common. The Soviets might view a ban on land-based mobiles as a trade-off for a ban on MIRVs. However, it cannot be predicted with any certainty whether, or for what price, the Soviets might eventually agree to a ban on such weapons.

The Soviets would see advantages in the provision of Option II permitting the deployment of mobile land-based ICBMs, because of their advances in developing such weapons systems. This provision would give them an incentive to argue for a higher ceiling (or no ceiling) than 1,300 ICBMs (including both fixed and mobile launchers) as their force of fixed ICBMs as of July 1 will be about that number. (They could, of course, substitute mobiles for older generation fixed ICBMs.) They would also exploit this provision to bolster their case for permitting mobile IR/MRBMs, which would be banned under the terms of this option.

f. SLBMs and SLCMs - The initial Soviet response to cease the initiation of construction of new SLBMs (Options IV, III, II) would probably be to reject this US approach, and to propose a formula which would allow the Soviets to match the current US Polaris force by continuing their present construction program. It is not possible to predict how firmly the Soviets would stick to this position. Perhaps the tactical intent of this likely initial response would be limited to the aims of obtaining (1) US acceptance of a high estimate of Soviet SLBMs presently under construction and, hence, permitted under the terms of this proposal, and (2) US concessions in other areas. It is possible that the Soviets would in the end be won over by arguments that, under the US proposal, the US advantage in numbers of SLBMs would be counterbalanced by the slight numerical advantage of Soviet ICBMs, the Soviet SLCMs, for which the US has no counterpart, and the large force of Soviet IR/MRBMs, also unmatched by the US.

The Soviets might well question the inclusion of SLCMs (submarine-launched cruise missiles) under this limitation, on the grounds that these are not strategic weapons but are intended for use against naval craft. As a bargaining ploy, the Soviets might ask for a US concession in exchange for this provision, such as a limitation on carrier aircraft.

The Soviets would regard with some suspicion the failure in Option I to place any limitation on SLBMs/SLCMs. In view of the declining US lead in SLBMs as the Soviet build-up continues, the Soviets might suspect that the US had ulterior reasons for not wanting to freeze the status quo and had plans to expand its own SLBM force. They might also be concerned about the economic implications of leaving this significant element of the strategic arms relationship open ended. However, the Soviets would see distinct advantages, over the short run at least, in the absence of a limit on SLBMs, as it would allow free rein to their current construction program. This short-term consideration could prevail over Soviet suspicions of US long-term intentions as far as SLBMs are concerned.

g. MIRVs - Evidence regarding Soviet intentions and attitudes toward a ban on MIRVs is rather ambivalent. Soviet officials have on occasion questioned US interlocutors about the US MIRV program in a manner suggesting concern. Soviet military planners probably conclude that the US is ahead of the USSR in developing MIRV technology. They may be concerned that the US MIRV program, given sufficient accuracy of reentry vehicles, could give the US a first-strike capability, regardless of an expansion of Soviet ABM defenses. The Soviets may also be persuaded of the argument that MIRVs, deployed on both sides, would destabilize the strategic balance and, hence, be detrimental to their interests.

Now that the Soviets have a MRV testing program under way, our judgment that they might press for a MIRV ban is less confident. There are several factors which could provide the Soviets motives to develop their own MIRVs. The dominant interest could result from a large ABM level where the Soviets might perceive MIRVs as necessary for penetration. Another factor could be to provide some damage limitation, although damage denial is not likely to be a serious Soviet goal given the US SLBM and bomber forces. And a third factor could be a perceived advantage resulting from the SS-9 greater throw weight. Furthermore, the Soviets may at this juncture be about at the point of concluding that the US MIRV tests to date might permit deployment of an operational system.

If on balance the Soviets preferred a MIRV ban they would probably insist on an immediate moratorium of MIRV flight tests. Even though they may have concluded the testing had already reached a point which permits deployment, they would want to check the accruement of US technological knowledge gained through further testing--especially if they were not confident that an overall agreement could be reached. They would probably accept a ban on MIRV tests and possibly on associated flight tests as a means of enforcing a ban on deployment under the terms of Option IV. However, they would be less concerned than the US about an air-tight ban on all associated tests, because of their higher degree of confidence of detecting--through public sources--possible US attempts to circumvent the agreement. The fact that the US already has MRVs deployed could cause the US difficulties in establishing a ban on associated MRV testing.

CIA believes that Soviet concern about the potential threat posed by planned US MIRV deployments is probably far greater than the above discussion suggests and may well have been a key factor in the Soviet decision in favor of arms control negotiations. The Soviets are presumably well aware of US statements that introduction of the Poseidon and the Minuteman III will increase many-fold the number of independently targetable US warheads, thus again tipping the balance in favor of the US in this important respect. They may well be concerned from their observation of US MIRV tests to date and from recent public discussions in this country that the US may be seeking to develop MIRVs which had the accuracy to be used against hard targets. While the Soviets have within the last year begun testing of a simple multiple warhead comparable to the Polaris A-3, it is still unclear whether this presages an effort to develop a MIRV, and in any event the Soviets must recognize that they are presently well behind the US in this field.

Accordingly, in CIA's view, the Soviets would appear to have strong incentives to press for a moratorium on further MIRV testing during negotiations and for a ban on MIRV deployment in any agreement. US insistence that such weapons as FOBS or DICBM be included in any MIRV test ban would complicate matters for the USSR. However, given the halting pace of the FOBS-DICBM test program to date and the apparently limited number of targets for such weapons, there is probably a good chance that the Soviets would be willing to sacrifice the FOBS-DICBM program for a MIRV test ban. Indeed, there is some possibility that they may have also intended the MRV program to provide some additional trading material in arms limitation negotiations.

h. ABMs - All options provide for an unspecified, mutual ceiling on ABMs, ranging from 0 to 2,500. Traditionally, the Soviets have shown a penchant for strategic defense. In the early sparring over the initiation of SALT, they made much of the point that talks would have to deal with both offensive and defensive weapons, suggesting reluctance to limit ABMs without getting something in return.

However, now the roles are somewhat reversed, in terms of the strategic weapons programs each side is actively pushing. Moreover, planned deployment of launchers for the Moscow ABM (Galosh) system has been cut back, and there is no evidence that a new generation ABM system is ready for deployment. Even so, the Soviets are continuing to develop and deploy large BMD acquisition and tracking radars, and are engaged in a program which could lead to improvements in the ABMs or a completely new system in time. It is possible that the Soviets would be disposed at this juncture to accept a low ceiling on ABM deployment, which would leave the Moscow deployment in place, block the presently planned full US safeguard deployment, and spare the Soviet Government the heavy expenses involved in deploying a large-scale ABM system of questionable quality. But if the Soviets feel that they have sufficiently promising follow-on systems coming, they may want a higher ceiling.

There is in any event no evidence of a Soviet willingness to dismantle the Moscow Galosh system--i.e., to agree to a total, mutual, ban on ABMs. A desire to protect against a small-scale, irrational, Chinese attack, or threat of attack, in the coming decade would be a factor impelling the Soviets to oppose a total ban.

The Soviets would probably oppose the allowance of sea-based ABM systems under Options I and II, because they have shown no inclination to follow this path in developing defenses against missiles and have little incentive to do so because they enjoy natural advantages in deploying forward-based fixed ABM systems.

i. Strategic Aircraft - The Soviets could be expected to seize on the failure of any of the options to provide for a limitation on strategic bombers. Whether the Soviets would insist on some sort of limitation, or would merely raise this issue as a bargaining point for gaining concessions in regard to other disputed points, is not clear.

The extensive Soviet efforts to provide for anti-aircraft defense demonstrates their concern over the potential threat of the US bomber force, in terms of both the present, clearly superior, US force, and the possibility of a qualitative or quantitative strengthening of that force. On the other hand, the Soviets recently have shown no inclination to expand or replace their own force of intercontinental bombers. This points to a Soviet position, to be held to at least initially, which would either impose a qualitative and/or quantitative freeze on present forces.

The Soviets have indicated that they would resist coupling restrictions on air defenses with restrictions on bombers. If the latter restrictions were considered, however, they agree to a limit on air defenses because of the interrelationship of the two problems and their existing extensive defenses.

19. Summary Evaluation of Options - In the following summation of probable Soviet reactions to the individual options, emphasis, once again, is given to likely initial reactions. The fact that the Soviets are judged likely to find a particular proposal acceptable or objectionable is not necessarily an argument for or against the proposal; other factors, such as the scope and viability of a proposal, and its net effect on US security interests must, of course, be weighed against its relative negotiability.

a. Option I - The singular characteristic of this option is that it offers the least restrictions on the strategic forces of both sides. It would limit the number of ICBMs on each side, but would not restrict the placement or the hardening of these weapons. Moreover, it would place no limitation on sea-based offensive missile systems nor would it restrict MIRVs. On the other hand, it would limit IR/MRBMs and ABMs and would completely ban mobile land-based systems.

The absence of any limitation on sea-based offensive systems would be the most attractive feature of this option to the Soviets. Over the short term, at least, they would see advantages in the opportunity provided under this option of continuing the expansion of their SLBM fleet to the point where it might equal or surpass the present US Polaris force. On the other hand, there are features of this option which the Soviets clearly would object to, in particular, the ban on land-based mobiles and the provision allowing ICBMs to be moved and super-hardened. (They might also object to the lack of a ban on MIRVs.) The open-ended nature of this option might cause the Soviets to question the viability and economic costs of an agreement based on it.

CIA would add that the Soviets might well consider that Option I was lopsided in its effect--that it called for a cessation of Soviet ICBM deployment, which the US had no intention of trying to match, but left the US free to carry on with its plans for MIRVs, an advanced manned strategic aircraft, superhardening of ICBM silos, and other qualitative improvements. Thus the Soviets might feel that acceptance would force them to continue an expensive arms race but on terms even more favorable to the US than at present.

As in all options, the Soviets would probably press for a resolution to their satisfaction of the bomber issue. Because of the lack of a ban on MIRVs, they might be inclined to seek a higher ceiling on ABMs than would be the case with a MIRV prohibition. The Soviet view of the ABM-MIRV relationship is unknown, however. While they may seek higher ABM levels where MIRVs are allowed, they might equally conclude that MIRVs make an extensive ABM deployment useless.

b. Option II - This option would be more restrictive than Option I in that it freezes the numbers of sea-based offensive launchers (SLBMs and SLCMs). It would be less restrictive by permitting the deployment of land-based mobile systems. Common features include the following: an upper limit on the number of ICBMs but with permission to replace existing launchers with new ones, thus permitting the substitution of super-hardened (and mobile launchers) in place of them; a freeze on IR/MRBMs; no ban on MIRVs; and a ceiling on ABMs.

The one distinctive feature of this option which would probably be attractive to the Soviets would be the provision permitting mobile ICBMs, which the Soviets would quickly exploit to press for a similar provision pertaining to mobile IR/MRBMs. However, they might be suspicious of US motives, and might prefer to trade their advantage in developing mobiles for US concessions in regard to other weapons systems. As in Option I, they probably would not favor, however, the license granted to substitute fixed ICBMs on a one-to-one basis, thus permitting super-hardening and other qualitative improvements of launchers, on the ground that this would create uncertainties within the framework of the overall agreement. As in Options III and IV, they would press for parity in SLBMs, though they might be persuaded to settle for the proposed freeze (permitting the completion of submarines under construction). They might also seek a ban on MIRVs, as in Options I and III.

As in all options, the Soviets would probably press for a resolution to their satisfaction of the bomber issue. Because of the lack of a ban on MIRVs, they might be inclined to seek a higher ceiling on ABMs than they would under Option IV, which calls for such a ban. The Soviet view of the ABM-MIRV relationship is unknown, however. Whey they may seek higher ABM levels where MIRVs are allowed, they might equally conclude that MIRVs make an extensive ABM deployment useless.

Variant II A, permitting each side to vary the mix of land-based and sea-based offensive launchers within an overall ceiling, would probably not be attractive to the Soviets because of the uncertainties it would create regarding the disposition of US forces.

c. Option III - This option is characterized by the freeze it would impose on all offensive strategic missiles launchers (no substitution permitted), limited restraints on qualitative improvements in ICBM and IR/MRBM missile launchers, a ceiling on ABMs, a ban on mobile land-based strategic systems, but no ban on MIRVs.

Viewed in regard to its separate components, this option might be the most difficult to negotiate. At the same time, it is an example of an effective negotiating opener, especially if the US were to consider alterations in its position in the course of negotiations. Also, viewed as an entity, the Soviets might prefer the broader scope of this proposal, as compared to Options I and II, as it would leave fewer uncertainties regarding the disposition of US strategic forces permitted under the agreement.

Soviet objections to this option would probably center on the freeze on SLBMs (submarines under construction could be completed), the ban on land-based strategic mobile systems, and (though there is less certainty on this score)* the failure to provide for a ban on MIRVs. As noted under Option II, they would almost certainly press initially for parity in SLBMs, but might settle for the provision under this option in a trade-off for Soviet advantages in other strategic systems. If the US were willing to consider a ban on MIRVs, coupled with a moratorium on flight testing, following the initial presentation of this option, this might prove to be a useful bargaining device in gaining Soviet concessions in other areas (e.g., in accepting a moratorium on the initiation of construction of ICBMs and SLBMs).

As in all options, the Soviets would probably press for a resolution of the bomber issue to their satisfaction. Because of the lack of a ban on MIRVs, they might be inclined to seek a higher ceiling on ABMs than they would under Option IV, which calls for such a ban. The Soviet view of the ABM-MIRV relationship is unknown, however. While they may seek higher ABM levels where MIRVs are allowed, they might equally conclude that MIRVs make an extensive ABM deployment useless.

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* See CIA paragraph, page 13.

22. As for expanding areas of cooperation, the obvious lesson of a strategic arms limitation agreement would be that, if the US and USSR can reach accord on a matter of this scope affecting their vital security interests, then further steps in this direction, as well as new cooperative ventures on matters of lesser importance, were fully possible. This would apply most directly to the field of disarmament. On the other hand, there is a singular degree of uniqueness in the mutuality of interests in reaching strategic arms agreement which might not be present in other potential areas of US-Soviet cooperation. Clearly failure to reach an agreement through negotiations could produce adverse reqults for agreement in other areas. Much would depend on the manner in which negotiations were broken off.

23. In any event, all of this would not mean a whole new era of US-Soviet relations. Even the most comprehensive strategic arms agreement which can be envisioned would not rule out all improvements in military forces; and agreement per se would not end the arms race. Soviet ideological commitments and political aims change slowly, sometimes not for the better. Conflicting interests would persist. An agreement might also reinforce certain current or potential trends tending to stiffen Soviet behavior. Apart from being bolstered in advancing propagandistic claims of military and political parity with the US, the Soviets might feel encouraged through an agreement codifying rough parity to be bolder in pursuing political goals through pressure tactics. It is difficult to see, however, how an agreement would, in this respect, alter the world as it presently is or is likely to be. Mutual deterrence has been a fact of life for some time and is likely to remain so. The essential question posed for US-Soviet relations is the level of strategic armaments and the degree of stability from which this deterrence will be derived.

II. Reaction of NATO Allies

24. Our NATO Allies have declared that they would welcome the initiation of SALT, and this would almost certainly be their reaction when the talks actually began. However, the majority of them have also made clear that they expect the US to consult closely with them, both before and during the negotiations and some of them have already signalled some of their underlying concerns in NATO consultations. They recognize that the talks would be bilateral and essentially would deal only with US and Soviet forces, but they sense that the outcome of the negotiations could affect vital security interests in European NATO members. This feeling is reinforced by an inarticulate fear in some NATO countries that the US and USSR could reach a deal at their expense. The President has recognized these attitudes by his pledge to hold close consultations, before and during the course of negotiations.

25. A foremost concern of NATO Allies would be the manner with which the US handled the issue of the Soviet IR/MRBM force targeted on Western Europe. Some might hope that the US would press for a reduction of this force. However, given the nature of the proposed agreement (a limitation, not a reduction), and the fact that we would ask the Soviets no more in regard to ICBMs and SLBMs than in regard to IR/MRBMs, our Allies would support the proposal (contined in all options) to freeze the USSR's fixed land-based IR/MRBMs and to ban mobiles in this category. Another concern would be to exclude NATO forces stationed in Europe from the terms of the agreement. None of the options contemplates limitations applicable to these forces. There would still remain a concern, expressed in some NATO quarters, that an agreement could affect indirectly the prospects for a united European nuclear force.

26. A deeper NATO concern would be the maintenance of an effective US deterrent, upon which the security of NATO as a whole rests. We have told our Allies that they need not be worried on this score, as we obviously would not enter into any agreement which would affect adversely US security interests and the effectiveness of its deterrent. We may, however, have to return to this point on many future occasions.

27. A US-Soviet agreement would probably produce contradictory reactions in Western Europe. Doubtless the majority of Europeans would welcome it as heralding a more meaningful detente in East-West relations. Some of them might be encouraged to press for a reduction of NATO conventional forces. The latter impulse, inherent in any period of detente, would have to be faced by the US when and if that time arrived. Other Europeans inclined to be suspicious of US-Soviet dealings affecting their interests (a suspicion which the Soviets might feed) might see the US as less willing and able to meet its NATO commitments. Our ability to head off or dispel this latter reaction would depend in large part on the effectiveness of our consultations within NATO. This latter, it should be noted, may constitute a difficult problem, given the need for secret discussions with the Soviets if SALT is to be fruitful.

III. Communist China

28. One certain result of the initiation of negotiations and an eventual agreement would be to elevate to a new peak Chinese Communist charges (representing part propaganda, part conviction) of US-Soviet collusion against Communist China. Sino-Soviet relations would suffer--though it is difficult to imagine a deterioration of their present low state. The impact on US-Chinese relations is less clear; it would probably not be decisive, one way or another.

Department of State
May 1, 1969

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This document consists of 38 pages.
Number 7 of 30 copies, Series B

#8935

OD-ACDA-3332 R

ACDA

NSSM-28 FINAL REPORT

PREPARATION OF THE U. S. POSITION ON

STRATEGIC ARMS LIMITATIONS NEGOTIATIONS

WITH THE SOVIET UNION

ANNEX D

SAFEGUARDS

ARMS CONTROL AND DISARMAMENT AGENCY
(X) Release ( ) Excise ( ) Deny
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FOIA, PA, E.O. Exemptions
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I. INTRODUCTION

In order to assure that the U.S. strategic forces are able to perform their assigned missions in the face of a developing but uncertain threat, the U.S. maintains a safeguard program whose function is to provide technological options to meet the threat and to provide a high confidence in our ability to monitor it as it develops. Under an arms control agreement it is also necessary that the U.S. maintain a safeguard program which:

1. Provides a capability to respond to changes in the threat to the U.S. and its allies as may be required by Soviet actions both within the treaty restrictions and in abrogation of the treaty and as may be required by possible developments of other powers.

2. Maintains under the provisions of an agreement a broad technological base in both weapon systems research and development and programs of fundamental research to support this R&D.

3. Insures high confidence of monitoring Soviet compliance with the terms of the treaty.

In an arms control environment the function of an extended safeguard program is to insure that under the agreement there would not be developments which would have an adverse effect on the strategic capabilities of the U.S. and the viability and utility of its alliance commitments. It is necessary to be able to provide responses to a wide range of possible developments in the threat which might arise within the limits of an agreement or from cheating or abrogation. The current safeguard program is designed for a set of contingencies which may arise in the absence of an agreement and this program may have to be modified to cover those new contingencies which may arise under an agreement.

The Safeguards programs are designed to meet, if necessary, potential Soviet threats to the survivability and penetration capability of our strategic forces. No attempt has been made in this paper to quantify the likelihood of these threats, which are assessed in intelligence estimates. An overall evaluation, based on agreed intelligence projections, of the effect under various options on our retaliatory capability (measured with urban industrial damage) is to be found in the strategic exchange analysis (see Annex A and Section V).

This annex is primarily focused on Objective 1 above, with the view of ascertaining the safeguards which would be required to support each of the arms control packages considered in the body of the report.

Objective 3 has been discussed in NIE 11-13-69 and the NSSM-28 Verification Panel Report. (The Working Group notes that the maintenance of an assured capability to monitor Soviet compliance with an agreement will be a continuing important safeguard and recommends that an ad hoc group be asked to examine this question further at the appropriate classification level.)

II. PRINCIPAL CONCERNS AND CURRENT PROGRAMS

This section discusses our present R&D safeguards program. Our R&D safeguards program would be affected by arms control in several ways. We might increase our emphasis on programs permitted under the agreement which would help maintain our strategic capability for two reasons. First, the Soviets might cheat on the agreement or abrogate it unexpectedly and we would need to be ready to complete development or proceed with deployment of these systems. Secondly, the agreement will probably require renewal after some specified number of years, and we should be ready to complete development or proceed with deployment if either we or the Soviets choose not to renew. We would also need to continue some R&D efforts on weapons programs which could not reach deployment under the agreement.

It is important to note that the lead time between beginning R&D on a weapon system and deploying it is quite long. For this reason, we must design the initial stages of our R&D programs against a threat which is quite pessimistic; this will allow us to proceed with the later stages of R&D and deployment if the Soviet threat exceeds even the high side of our intelligence estimates.

Our present R&D safeguards program is designed against an unconstrained Soviet threat in the absence of an arms control agreement. Even for this unconstrained environment, the pessimistic threats discussed are not to be taken as intelligence estimates.

In the presence of an arms control agreement we would still need to be quite conservative in our assessment of the Soviet threat for the purpose of designing our R&D safeguards program, but an arms control agreement could give us a more distinct picture of the ranges within which the Soviet threat might fall. The SNIE 11-13-69 indicates that the Soviets would be unlikely to cheat on the agreement unless they aim to alter the strategic balance and any other goal would probably not be worth the risk. Under an agreement, we could plan our R&D safeguards program to insure that we could have any needed new systems ready to deploy within the time required to maintain our retaliatory capability, given the time we would have between the date when we learn of a Soviet violation and the date of the deployment of a sufficiently large Soviet force to threaten our deterrent. Any realistic planning of our R&D efforts under a specific arms control option will require more specific work, including a continued review and updating, than appears in this Report.

A. FIXED SILO VULNERABILITY

With the rapid Soviet ICBM build up since 1966, there has been a growing concern for Minuteman survivability. Currently there are over 1200 ICBM's and SLBM's in the Soviet operational inventory. With the continued deployment of the SS-9, SS-11, SS-13 and SS-N-6, the threat to Minuteman silos could evolve from several sources: an increase in the number of high yield weapons, an increase in missile accuracy or an accurate MIRV capability. The SS-9, with its high payload and relatively high accuracy, is already suitable for use against hard targets, and is a good candidate for a MIRV system. Conceivably, the SS-11, SS-13, and SS-N-6 could be developed into hard target weapons through development of greater accuracy and possibly through a MIRV system as well.

To meet this threat there are two principal R&D programs for improving the survivability of the land-based missile force.

Minuteman Defense

The Safeguard ABM deployment could provide a light defense to four of the Minuteman Wings: Grand Forks in Jan. 1974, Malmstrom in July 1974, Whiteman and Warren in 1975. This defense could be increased to cover all Minuteman silos by the addition of more MSR radars and Sprints.

Hard Rock Silos

A program to demonstrate the technology for hard rock missile facilities is currently in progress. A 3000 psi silo and a 6000 psi launch control facility are the goals. A prototype launch facility test is planned for May 1972. If successful, and site surveys determine that adequate hard rock is available, an IOC in mid 1974 would be possible.

The hard rock silo is vulnerable to high yield or very accurate RV's. Consequently, there are several alternatives involving hard rock silos and defense under review at the present time. Against accurate or high yield warheads, defense is attractive. Against small multiple RV's with CEP's greater than 0.25 NM, the super hard silo is attractive. The alternatives are:

1. Increase the defense of the present silos beyond that programmed in the Safeguard deployment.

2. Relocate all or a fraction of the Minuteman force to hard rock silos.

3. Add more Minuteman in hard rock silos.

4. Relocate and defend the force, thus taking advantage of both the characteristics of defense and hardening to make the development of many small, highly accurate RV's a requirement for a successful attack against Minuteman.

To support this latter alternative, special hard point defense systems are being studied within the advanced BMD development program.

Other Alternatives

Since the development of small, highly accurate RV's is within present U.S. technology and may be within Soviet technology, other alternatives are being examined for their effectiveness in providing a long term solution to land-based survivability. Among these are systems that employ deceptive basing or mobile ICBM launchers.

B. ABM PENETRATION

Since 1962 when construction of the Moscow ABM system was initiated, the credibility of U.S. missile penetration has been of concern to U.S. planners. This concern involves the possibility of change in four areas which involve differing response requirements:

1. Expansion of the Moscow Galosh system for protection of other Soviet cities.

2. The extensive Tallinn system deployment and a possible point-in-space*ABM intercept capability for this system.

3. Deployment of a new long range intercept system, a second generation one to replace the Galosh. Such a system is currently projected to have a possible 1973-75 IOC.

4. Deployment of a short-range terminal defense system with a high acceleration interceptor, like Sprint, for endo-atmospheric intercept.

One of the most important factors in assessing the Soviet ABM capability is to provide sufficient lead time to permit adequate U.S. reaction and response. Current Soviet ABM deployments involve the ABM-1 network around Moscow and the various large phased array radars being constructed throughout the USSR. It has taken the Soviets five to six years to build an ABM-1 complex. Any initial construction of new ABM-1 complexes would be detected well before IOC. The deployment of a new ABM system could be more difficult to identify. If the new system were tested at a known range in its operational configuration, the U.S. would be able to identify it at least two years before IOC. In the case that testing could be carried out on an ABM system under conditions of concealment and deception, detection of a deployment program would still occur rather early but identification as an ABM system might not be possible more than a year prior to IOC.

Any high performance SAM system with a nuclear warhead of sufficient size has an inherent potential for point-in-space RV intercept. Conversion of a SAM to ABM would be dependent on the system sophistication. If SAM systems such as Tallinn can receive and process data from long range radars, they could provide a point-in-space defense against ballistic missile attack. This capability would have only a low probability of being verified by national means. The threat of this type of intercept capability can be countered by effective exoatmospheric penetration aids.

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* With a point-in-space intercept capability the defender cannot track the attacking RV with a missile site radar. He can only estimate the time at which it would arrive at a point in space based on data from his acquisition radar. This capability has only a very low kill probability even against single RVs without penetration aids. It would be unsophisticated compared to the Soviet Galosh ABM and quite unsophisticated compared to the U.S. Spartan and Sprint ABMs.

There are two primary programs to insure that a possible expanded Soviet ABM defense through the 1970 to 1975 time period can be penetrated: the Poseidon and Minuteman III.

Poseidon

The Poseidon will carry 10[redacted] Mk-3 RV's nominally with a capability for 14. The planned force is 496 Poseidon missiles on 31 boats. The conversion from Polaris is currently underway with a Jan. 1971 IOC for the first boat. By mid 1973, 20 Poseidon boats will be operational. The conversion is scheduled for completion by the end of 1976 when the 31st boat becomes operational.

Minuteman III

The Minuteman III is programmed for a June 1970 IOC. Half of the force will have 3 Mk-12 [redacted] RV's and half 2 Mk-12 RV's; both will have 15 chaff puffs as exoatmospheric decoys. If the Soviets deploy a terminal defense, 10 terminal decoys can be added to the 2 RV configuration. By mid 1973 there will be 400 MM III and by mid 1976 528 MM III.

In the event that the Soviets deploy a terminal defense that could discriminate endoatmospheric decoys, the MM III together with Poseidon may not be adequate. There are a number of programs and options for this contingency.

- Increase Poseidon to 14 RV's: This option would sacrifice range and hence target coverage to increase the penetration capability of the force.

- Increase the number of RV's on the MM III: The Mk-18 is a proposed design carrying a[redacted] warhead. Alternatively, the Mk-3A (a modification of the Poseidon Mk-3) could be used to increase the number of RV's on Minuteman.

- Increase the Total Offensive Force: The possibility of heavy Soviet ABM defenses can be countered by improving the survivability of Minuteman, deploying larger missiles with advanced reentry systems, increasing the number of land-based missiles, or increasing the number of sea-based missiles.

In addition, within the ABRES program a broad research and development effort is being conducted on reentry physics, maneuver technology, RV and decoy design and other modes of improving the penetration capability of a given missile payload.

C. SSBN SURVIVAL

In the past few years the Soviets have steadily increased their ASW forces. Though we have no evidence of any present or prospective Soviet breakthrough in ASW that would sharply increase the threat to the Polaris/Poseidon system, we cannot ignore the possibility that an ASW threat may emerge in the 1970's. The two areas of concern which effect strategic planning for future security of the submarine force are:

1. A general improvement in Soviet surface and air ASW units, through both an increase in capability and number, could deny confident deployment of the SSBN's in current operating areas. With the range limitation of Polaris and Poseidon, loss of the Norweigian Sea and the Mediterranean would seriously restrict the target coverage of the force. For Poseidon this may require a reduction in the number of Mk-3 RV's that can be deployed.

2. With the deployment of follow-on Soviet attack submarines, the prospect of an SSBN trailing capability for the Soviets must be considered. In time, this could effect force survival in all ocean areas.

As a safeguard against these possible developments, measures for SSBN self defense are currently being pursued. As a long range counter, ULMS (Underwater Long Range Missile System) is in concept formulation. Actual design is expected in FY 70-71. There are two options for the ULMS missile system at ICBM range: a new missile or a modification of Poseidon which adds a new first-stage motor under the existing two stages. Current funding concentrates on the design of the submarines, the long leadtime item in the system. IOC would be in seven years following design formulation. To expedite the program, the building of an R&D ULMS prototype is being considered.

D. BOMBER PRELAUNCH SURVIVAL

Currently 40 percent of the strategic bomber force is on alert, capable of being airborne within 10 to 15 minutes following BMEWS warning. With the threat of depressed trajectory SS-X-6 and with the increase in Soviet SLBM capability (1500 NM range for the SS-N-6), the viability of the bomber force depends on an improvement in tactical warning and increased dispersal of the force to additional bases both to give more targets for an attack to cover and to decrease the number of alert aircraft at each field.

Programs for improving tactical warning are:

- The 440L forward scatter OTH radar system has an interim operational capability for warning of mass ICBM launch 35-40 minutes prior to impact. Full design capability is expected by mid 1970.

- The 949 synchronous satellite system will detect booster burn with infrared sensors. With a satellite in each hemisphere, individual or multiple ICBM, FOBS and SLBM launches can be detected. Operational capability is planned for mid-1971.

The SLBM threat presents the greatest problem for tactical warning. Even with launch detection only those bomber bases in the north central U.S. would have adequate tactical warning time for the alert force to escape a well coordinated SLBM strike. With seaward PAR and MSR radar coverage the "Safeguard" ABM defense will provide both warning and protection of the bomber force. With the present deployment schedule this system will have an FOC by early 1976 if approved.

E. BOMBER PENETRATION

The primary air defense penetration mode is a low altitude flight profile that avoids early radar detection and compounds the intercept problem. The Soviets have been working on this problem for some time. It is believed that some 400 manned interceptors now have an all-weather interceptor capability down to 1000 ft. altitude. It is expected that the newer Soviet long range interceptor, Foxbat, may be given a look-down and shoot-down capability. In addition, the Soviets have been testing an AWACS aircraft (airborne warning and control system). Based on our own experience, its long-range surveillance radar is unlikely to have a significant capability for detecting low altitude penetration over land. However, such a system may have a good capability over water and thus would extend the Soviets intercept range beyond the land mass.

Currently there is an extensive SAM defense net throughout the Soviet Union. There are about 10,000 SAM launchers deployed both as a barrier defense and as a local defense in or about cities. Once again, it is the low altitude detection and intercept capability of these systems that is critical. With proper siting the SA-2 system is believed to have coverage as low as 1000 ft. altitude. In a few areas, the coverage may be as low as 500 feet. The less extensively deployed SA-3 system may have a capability down to about 500 feet.

To defeat the SAM defenses either by penetration or exhaustion, the SRAM bomber-carried missile with standoff range of 25-30 NM is under development. This system will allow a bomber to attack SAM defended targets without flying directly over them.

Several techniques for improving the penetration capability against an advanced Soviet area defense are under development.

- SCAD (Subsonic Cruise Armed Decoy) is in concept formulation and propulsion development. This system is expected to have a range of approximately 1000 NM at 1000 ft. and be equipped with bomber simulation aids. Thus, both a long-range stand-off capability and an area defense saturation capability may be obtained.

- BDM (Bomber Defense Missile) - This system is currently under investigation as both a bomber defense weapon against manned interceptors and as a terminal defense penetrator.

To maintain and improve the capability of the strategic bomber force, the FB-111A will have an October 1970 IOC; if present goals are met, AMSA could have an IOC in 1976.

F. DEFENSE

There are four possible objectives of strategic defensive systems development:

1. Provide tactical warning and protect the command function to insure retaliation.

2. Protect retaliatory forces from Soviet attack.

3. Deny damage to a potential CPR nuclear threat.

4. Protect population and industry.

It is the objective of the "Safeguard" system to meet the first three. Phase I will have an early 1974 IOC with a full operational capability for the total system by early 1976 if approved.

Without an ABM defense of U.S. cities, it is not currently possible to meet the fourth objective with a balanced high confidence damage limiting program. Should a city defense be required in the future, there are the following R&D programs supporting the overall damage limiting goal:

1. Advanced BMD Development. This program consists of a broad effort in improving ABM systems effectiveness. Among these are: development of a remote launch Sprint, an Improved Spartan with a loiter intercept mode, improved radar resolution, long wavelength infrared sensors for defeating chaff, homing interceptors using IR.

2. AWACS for extending surveillance and bomber intercept control to ranges of about 500 NM off-shore.

3. F-106X with an advanced look-down fire control system.

4. SAM-D and Hercules/Hawk Terminal bomber defense improvement. This includes an assessment of using SAM-D together with the "Safeguard" system to assist or complement each other in the air defense and ABM roles.

5. Civil Defense Research, including studies of both blast shelter and evacuation feasibility.

6. SABMIS an early mid course sea-based ABM intercept system is under study.

G. SUMMARY OF CURRENT PROGRAM

The major elements of the current safeguard program are summarized in Table I and Table II. Many are applicable as responses within the various option, though deployment of some is outlawed or constrained by the options. These must be maintained within the R&D program against possible Soviet abrogation. A particular option will require a review and reorientation of the relative priorities that have been assigned. No such attempt is given here.

TABLE I

MISSILE FORCES	SURVIVABILITY	
	POTENTIAL THREAT	**SAFEGUARDS**
Land-Based ICBM's	. Accurate MIRVed SS-9	. Sprint defense of Minuteman
	. Accurate SS-11, 13	. Hard rock silos
	. Increase in SS-9, 11, 13	. Increase in numbers of missiles
		. Mobility or deception
Sea-Based SLBM's	. Overall ASW Improvement	. SSBN defense development
	. Deployment of nuclear attack submarines	. ULMS

PENETRABILITY	
POTENTIAL THREAT	**SAFEGUARDS**
. Additional Galosh deployment	. MM III, Mk12 MIRV
. Tallinn ABM capability	. MM survivability options
. New long range ABM	. Increased land-based throw weight with adv. reentry systems
	. ABRES
. New short range ABM	. Poseidon, Mk3 MIRV
	. 14 Mk3 on Poseidon
. Pen aid discrimination	. Increased Sea-based throw weight with adv. reentry systems

TABLE II

BOMBER FORCES

	POTENTIAL THREAT	SAFEGUARDS
Pre-launch survival	. SLBM increase . FOBS/MOBS, DICBM	. ABM defense of SAC bases . Warning, dispersal, alert.
Penetration	. Soviet AWACS and improved manned interceptor . SAM low altitude intercept capability	. SRAM . FB-111 . SCAD . BDM . Penetration aids . AMSA

DEFENSIVE SYSTEMS

	POTENTIAL THREAT	SAFEGUARDS
ABM	. CPR ICBM dev. . Increasing Soviet missile force . MIRV, pen aid	. Safeguard ABM . Advanced BMD program . SABMIS
Bomber Defense	. Low altitude penetrators . Long range ASM . Supersonic bomber	. AWACS . F-106X . SAM-D, HAWK
Civil Defense.	. Increasing Soviet offensive megatonnage	. Shelter survey . Warning

IV. ASSESSMENT

A. CRITERIA

Each NSSM-28 package requires R&D safeguards that will let us protect our strategic capability against possible qualitative and quantitative improvements in Soviet strategic forces. The possible Soviet force improvements that are of concern were described in the previous section. The permitted improvements in Soviet forces that present significant threats are different for each NSSM-28 package and Variant. The following sections describe the important threats for each package, list the R&D safeguards that are applicable and identify threats for which no safeguards are available within the agreement.

Certain safeguards would have to be maintained even though an agreement would limit certain Soviet systems, but the stage at which the development of the U.S. safeguards must be kept would depend upon many factors -- our confidence in detecting specific sorts of cheating, the leadtimes of the Soviet systems, the leadtimes of our own, etc. As has been previously indicated, these questions must be reviewed in detail in a later study.

TABLE III

PACKAGES SUMMARY

<table>
<tr><th rowspan="2"></th><th rowspan="2">MIRV</th><th rowspan="2">SLBM</th><th colspan="2">ICBM</th></tr>
<tr><th>Fixed</th><th>Mobile</th></tr>
<tr><td>Package I</td><td></td><td></td><td>Freeze Number</td><td>Ban</td></tr>
<tr><td>Package II</td><td></td><td>Freeze Number</td><td colspan="2">Freeze Number</td></tr>
<tr><td>Variant IIA</td><td></td><td colspan="3">Freeze Number</td></tr>
<tr><td>Package III</td><td></td><td>Freeze Deployment</td><td>Freeze Deployment</td><td>Ban</td></tr>
<tr><td>Variant IIIA</td><td></td><td>Freeze Deployment</td><td>Freeze Number</td><td>Ban</td></tr>
<tr><td>Variant IIIB</td><td></td><td colspan="2">Freeze Number</td><td>Ban</td></tr>
<tr><td>Package IV</td><td>Ban</td><td>Freeze Deployment</td><td>Freeze Deployment</td><td>Ban</td></tr>
</table>

All Packages

IR/MRBM: Freeze deployment, ban mobile
SLCM: Freeze deployment (except Package I)
Bombers and Air Defense: No restriction
ABM: with agreed numbers and basing.

Definitions

Ban: No deployment, no testing
Freeze Number: Total number of launchers fixed, replacement of launchers allowed
Freeze Deployment: Freeze with current number deployed or under construction (submarines can be replaced after specified time)

B. SAFEGUARDS REQUIRED FOR NSSM-28 PACKAGES

The options considered in this review are summarized in Table III. With the exception of Option IV which imposes a ban on MIRV, there are but two central issues that dominate the unique safeguard requirements for these packages.

1. The flexibility that is permitted in each package for improving the survivability of offense-forces.

2. The level of ABM permitted.

Since the level of ABM is considered as an open parameter for these packages, the essential features of ABM restrictions are reviewed first, independent of the offense limitation. The safeguard requirements for the various offense limitations are then developed following this ABM review.

In assessing the safeguards required for each option only those required in addition to the present program are discussed.

General Consideration of ABM Restrictions

The effect of various levels of ABM restrictions on U.S. safeguard requirements are illustrated by considering three specific levels of defense.

100 Interceptors

With a limitation at this level the U.S. forecloses the possibility of achieving within the treaty either a CPR defense or any damage limiting capability against the Soviet threat.

There are two issues associated with a deployment at this nominal level apart from the fact that such a restriction would freeze the Soviets with approximately their present deployment. (1) What military purpose would be served by only 100 ABM interceptors? and (2) Could a deployment at this level serve to reduce the leadtime to IOC of a more extensive system should it be required at some later time?

If the response leadtime to IOC is to be kept as low as possible to provide a safeguard against a future ABM requirement, current "Safeguard" components must be programmed for deployment at the 100 interceptor level. With these components there are four possible deployments:

1. National Command Authority Protection
2. Some Protection of Major Population Centers
3. Limited CONUS Coverage
4. Phase I "Safeguard"

With the radar coverage of deployment option three, the leadtime to an ABM response should it be required is primarily dependent on the rate at which Sprint and Spartan production can be initiated. Without the radar coverage of deployment option three, this leadtime is from three to four years depending on the degree with which preliminary site preparation has been accomplished and long leadtime radar components have been stock-piled. However, if the Soviets are permitted the radar coverage of deployment option three, the threat of an upgrade of SAM systems to ABM would be increased. Further, though U.S. reponse time is reduced, the Soviet opportunity for either covert interceptor deployment or rapid abrogation is enhanced.

At this level of defense, it may be possible to obtain better CONUS coverage against a CPR ICBM threat than that of deployment option three if a forward based early mid-course intercept system can be deployed or a CONUS based system with interceptor flyout capabilities approaching 1000 NM coverage can be obtained. Programs to develop these capabilities should be considered to supplement or replace the "Safeguard" ABM components.

Without ABM coverage of the SAC bomber fields, an SLBM surprise attack on these bases is of concern. There are three operational safeguards for this contingency.

1. Rebase the entire bomber force inland to the northern midwest to increase SLBM tactical warning time and rely on 949 for warning of a DICBM or FOBS attack.

2. Stand a continuous airborne alert with the force. About 50 bombers could be kept continuously in the air; against increasing Soviet air defense, this number would be of questionable value.

3. Disperse the force to fields beyond those normally used as military bases.

200-500 Interceptors

Within this range, the U.S. could, as a minimum, install Phase I of the Safeguard ABM to provide protection of up to four of the six Minuteman wings plus the National Command Authority at Washington. Alternatively, we could deploy a nationwide area ABM system which would give some protection to SAC bomber bases and accidental launch protection. At 200 interceptors, a nationwide system could provide significant damage limitation against the mid-70 Chinese ICBM threat, especially in scenarios involving a U.S. counterforce strike. At 500 interceptors, nationwide area protection would be comparable to that associated with Safeguard. However, allocating all our interceptors for nationwide protection would result in only minimum ICBM defense capabilities. At any level of nationwide defense, our bombers would receive improved early warning.

In the event the Soviets cheat or abrogate the agreement and improve their capabilities to attack our ICBMs, we would want to be in a position to rapidly increase our ICBM and bomber protection. We could deploy additional Sprints at our Minuteman fields with the leadtime determined mainly by the existing radar net. Existing MSRs could support additional Sprints. With PARs deployed across Northern U.S., the deployment leadtime would be for needed additional MSRs, and could be about 1-1/2 to 2 years, given stockpiling of components. Construction of additional PARs would take 3-4 years.

"Safeguard" ABM System Level (600-1000 Interceptors)

At this level the U.S. could proceed with the "Safeguard" deployment, achieving

1. Protection against a future CPR missile threat through the 1970's.
2. Pre-launch protection of the bomber and tanker force.

3. Protection of the NCA.

4. A thin defense of a fraction of the Minuteman force.

Since radar component and interceptor production facilities would be functioning through 1973 in direct support of the deployment schedule, a relatively rapid response would be available in the event that an increase in ABM protection in excess of the treaty level is required. As a safeguard beyond this time, these facilities could be maintained at a minimum restart time.

1500-2500 Interceptors

For this level of ABM, there are two basic alternatives:

1. CONUS coverage with a "Safeguard" ABM level of interceptors plus either a Sprint defense of the current Minuteman force or defense of a relocated force (if permitted within the treaty).

2. CONUS coverage with a "Safeguard" level of interceptors plus a Sprint urban defense of major cities.

For the latter alternative some damage limiting posture against the Soviets might be achievable within the treaty and with current ABM components. For the previous ABM restrictions this is not the case. The only alternative for population protection will be that of civil defense.

In general, with a limitation on defense level, the only alternatives for the defense, if it is to keep pace with offense improvements, is to improve interceptor performance and threat discrimination capability. Both of these characteristics are currently being pursued by the Advanced BMD development program and should continue to receive attention.

Effect of an ABM Limitation on U.S. Penetration Safeguards

It appears that the Soviets are now actively working on a new or improved ABM system. All those R&D safeguards not prohibited by the terms of the treaty and which are currently available must be retained against the possibility of a Soviet deployment of a sophisticated next generation system.

It would be difficult to conceal preparation for a large deployment, and some years warning would be available before the system would have a significant ABM capability. In this time the U.S. could initiate deployment of a ballistic missile ship with Poseidon or rapidly deploy additional Minuteman missiles.

EFFECT OF OPTION I

SURVIVABILITY

	POTENTIAL THREAT		SAFEGUARDS
	Accurate MIRVed SS-9	Restricted or prohibited →	Sprint defense of Minuteman
Land-Based ICBM's	Accurate SS-11, 13	Prohibited →	Hard rock silos
	Increase in SS-9, 11, 13	← Restricted	Increase in numbers of missiles Mobility or deception
Sea-Based SLBM's	Overall ASW Improvement		SSBN defense development
	Deployment of nuclear attack submarines		ULMS
Bombers	Increase in SLBM/SLCM		Dispersion Increased Alert
	Upgrading of SLBM/SLCM platforms and missiles		Warning ABM defense of SAC bases

PENETRABILITY

POTENTIAL THREAT		SAFEGUARDS
Galosh	← Restricted →	MM III, Mk12 MIRV
Tallinn ABM capability		MM survivability options
New long range ABM	By replacement only →	Increased land-based throw weight
New short range ABM		ABRES Poseidon, Mk3 MIRV
Pen aid discrimination		14 Mk3 on Poseidon Increased Sea-based throw weight

OPTION I

MINUTEMAN SURVIVABILITY

Soviet Threat

The option outlaws further Soviet increases in ICBM launchers. Within the limit of total launchers permitted, deployment of the SS-9 could continue as a replacement for the older SS-7 and SS-8 systems and even the SS-11. Thus, the Soviets could greatly increase their SS-9 force. Further, their sea based offensive missile force which is unconstrained could also threaten MM given improved accuracy. Hence, with this option the eventual threat to Minuteman might be no less than that without the restriction of Option I.

Restrictions on U.S. Response

Addition of more Minuteman or relocation to a land mobile or deceptive deployment to increase survivability are not permitted.

Defense of Minuteman would be limited by the ABM agreement.

Possible Safeguards

Relocation of Minuteman to hard rock silos is permitted. Some defense of these silos may be possible depending on the ABM restrictions.

Alternatively, the Minuteman force could be left as is, reduced, or phased out with an increase in the sea-based force.

MORE MISSILE THROW WEIGHT

The Soviet total missile throw weight could continue to increase by either retrofitting the SS-11 and SS-13 silos with larger missiles or replacing these silos with new and larger ones. The Soviet SLBM force could continue to increase.

The U.S. could add more Poseidon, ULMS and retrofit with a larger Minuteman missile.

PENETRATION

There is no restriction (other than the constraint on number of ICBMs) on the U.S. capability for a response to increase missile penetration capability should it be required.

SUMMARY

No additional safeguards to those currently available or within the present R&D program are indicated at the present time. With this option there is the flexibility to switch to a predominately sea-based offensive force if the threat against fixed land-based systems should so indicate. Against the possibility of an increasing threat to sea-based systems, switching to a predominantly land-based force would not be permitted. Thus, the long range offensive system safeguard requirements would depend on possible Soviet ASW developments in the '70's.

The threat options left open to the Soviets, such as increasing SLBMs, make necessary continuing U.S. programs in response to or in anticipation of increasing Soviet capabilities.

DECLASSIFIED TOP SECRET

EFFECT OF OPTIONS II, IIA

SURVIVABILITY

	POTENTIAL THREAT		SAFEGUARDS
Land-Based ICBM's	. Accurate MIRVed SS-9	Restricted or prohibited	. Sprint defense of Minuteman
	. Accurate SS-11, 13	Prohibited	. Hard rock silos
			. Increase in numbers of missiles
	Increase in SS-9, 11, 13	Restricted	
		Prohibited	. Mobility or deception
Sea-Based SLBM's	. Overall ASW Improvement	As replacement only	. SSBN defense development
	. Deployment of nuclear attack submarines		. ULMS
Bombers	. Increase in SLBM/SLCM	Restricted	. Dispersion
			. Increased Alert
	. Upgrading of SLBM/SLCM platforms and missiles		. Warning
			. ABM defense of SAC bases

PENETRABILITY

POTENTIAL THREAT		SAFEGUARDS
. Galosh . Tallinn ABM capability . New long range ABM . New short range ABM	Restricted	. MM III, Mk12 MIRV . MM survivability options
. Pen aid discrimination	Mix Option open for IIA	. Increased land-base throw weight . ABRES . Poseidon, Mk3 MIR . 14 Mk3 on Poseidor . Increased Sea-base throw weight

DECLASSIFIED TOP SECRET

OPTION II, IIA

These options differ from Option I in that they restrict the SLBM force but permit land mobile ICBMs.

From the standpoint of safeguard response flexibility, this option differs from Option I in the following:

- Minuteman or a new larger Minuteman could be relocated to a mobile launcher system in addition to a hard rock silo.
- If an increase in total U.S. throw weight is required, this increase must be by replacement, not by increase in additional sea-based missiles.

SUMMARY

No additional safeguards to those currently available or within the present R&D program are indicated at the present time.

For option II the current division of offensive missile forces between land and sea-based is maintained. For option IIA there is complete freedom to alter this mix within the constraint of a fixed number of offensive missile launchers. With this option, the long range offensive system safeguard requirements could be adjusted to accomplish the most cost effective responses as the Soviet threat evolves.

As in Option I, the threat options left open to the Soviets, such as land mobile ICBMs, make necessary continuing U.S. programs in response to or anticipation of increasing Soviet capabilities.

EFFECT OF OPTION III

SURVIVABILITY

	POTENTIAL THREAT		SAFEGUARDS
Land-Based ICBM's	. Accurate MIRVed SS-9	Restricted or prohibited	Sprint defense of Minuteman
	. Accurate SS-11, 13	Prohibited	Hard rock silos Increase in numbers of missiles Mobility or deception
	Increase in SS-9, 11, 13	Restricted	
Sea-Based SLBM's	. Overall ASW Improvement	As SSBN replacement only	. SSBN defense development ULMS
	. Deployment of nuclear attack submarines		
Bombers	Increase in SLBM/SLCM	Restricted	. Dispersion . Increased Alert . Warning ABM defense of SAC bases
	. Upgrading of SLBM/SLCM platforms and missiles		

PENETRABILITY

POTENTIAL THREAT		SAFEGUARDS
Galosh	Restricted	. MM III, Mk12 MIRV
Tallinn ABM capability	Restricted	MM survivability options Increased land-base throw weight
New long range ABM		. ABRES
New short range ABM		. Poseidon, Mk3 MIR
		. 14 Mk3 on Poseidon
. Pen aid discrimination	Prohibited	Increased Sea-base throw weight

MINUTEMAN SURVIVABILITY

Soviet Threat

The option stops further deployment of the SS-11 and SS-13 and unlike Options I and II would stop construction of SS-9 silos as a substitution for other launchers. However, the Soviets could continue deployment of the SS-9 by retrofitting the 220 SS-7 and SS-8 launchers with these missiles although most of the launchers are soft and the hard silos are in clustered aiming points. Thus, the eventual threat to Minuteman might conceivably be no less than that without the launcher freeze restriction of Option III.

Restrictions on U.S. Response

A launcher freeze with current basing would prohibit increases in Minuteman launchers, relocation to hard rock silos, and mobility or deception as survivability measures.

Defense of Minuteman would depend on the ABM agreement.

Safeguards Response

Though increasing the hardness of existing silos is explicitly allowed, changing the basic external configuration of silos is explicitly prohibited. Upgrading the hardness of the silos to 600 psi is possible within these constraints. This, by itself, is not an adequate safeguard against Soviet CEP's less than a quarter nautical mile, should the Soviets be able to achieve this capability.

Thus, there are three basic alternatives for the Minuteman force, each of which places a different relative emphasis on the overall Safeguard program.

1. Discount Minuteman for any majorrole other than pre-emption should the Soviets be able to develop high accuracy.

   - Emphasis is placed on those safeguards which maintain the survivability and penetrability of the submarine and bomber force.

2. Deploy all or a portion of the allowed level of ABM interceptors for defense of Minuteman.

3. Develop a credible launch-on-warning capability.

   - The apparent retaliation capability is not as critically dependent on bomber and submarine force safeguards.

MORE MISSILE THROW WEIGHT

The Soviet total missile throw weight could continue to increase by retrofitting a larger payload missile in the SS-11 and SS-13 silos. This, together with a retrofit of the SS-7 and SS-8 launchers with SS-9 missiles, could increase the total Soviet ICBM throw weight by a factor of two or three.

The U.S. could retrofit the Minuteman force with a new larger missile of approximately 6000-8000 kps if required, thus tripling the overall ICBM throw weight.

ULMS could replace Polaris and Poseidon with both a larger missile and greater percent of alert time.

PENETRATION

Because of the question of Minuteman survivability, the penetration capability of the missile force is sensitive to the Soviet ABM defense. The capability of the programmed Polaris / Poseidon force for high confidence penetration will depend on the ABM level. Increasing the Poseidon payload from the programmed 10 to 14 RV's will improve the penetration capability.

Increasing the sea-based missile force is prohibited with the exception of ULMS as a replacement. Thus, those safeguards that maintain the capability of the bomber force and increase, insofar as possible, the deliverable Minuteman throw weight could provide safeguards against either a covert Soviet ABM capability or an overt abrogation following a short warning of intent. Limiting Soviet ABMs to a low level in the agreement would also limit the possibility of an increased threat to our missile penetration capability.

POSSIBLE SAFEGUARDS IN ADDITION TO CURRENT PROGRAM

The following measures could be instituted within the constraints of the treaty for improving the Minuteman force:

1. Increase Silo Hardening

   Minuteman hardness could be increased to in excess of 600 psi. A complete modification to the force would take approximately 5 years with about one wing out of commission per year. In the time it would take for this modification, Soviet accuracy improvement could negate the gain

2. Launch-On-Warning

   Increase the number of 949 type satellites deployed for greater redundancy of launch warning to assure early acquisition and good quality tracking of SLBM's, ICBM's and FOBS. Two additional PAR's or FPS-85's in the southern hemisphere and one in Greenland. Maintain BMEW's. Develop a reliable system for detection of sensor attack.

3. Hardening Against Pin Down

   Launch-on-warning may require an increase in inflight hardening beyond the 1 cal/cm^2 planned for Minuteman.

4. Large Payload Minuteman

   A "hot" flyout would be feasible with a 90" diameter 6000 lb. throw weight missile. A "cold" launch could be as large at 116" in diameter and have about 9000 lbs. of throw weight.

5. Retargeting

A rapid force-wide retargeting for those missiles not destroyed before launch, could increase the effectiveness of a surviving force.

The penetration capability of the missile force could be improved over current programs with the following:

1. A-3 MIRV

The ten SSBN's not planned for Poseidon conversion could be fitted with an A-3 MIRV of four to six Mk-3 RVs. This may have an earlier IOC than is possible with ULMS replacement of these ten SSBN's.

2. FOBS or DICBM for Titan II

A possible area defense suppression weapon to be launched on warning.

3. Strike Assessment

With large uncertainty in Soviet ABM capability and in U.S. surviving throw weight, the development of a real time missile strike reporting system may be attractive. If such a system, together with the necessary command and control, can be made reliable and survivable, both the sea-based and Minuteman forces could be employed with greater effectiveness.

The effectiveness of the bomber force could be increased by increasing the total force:

1. SRAM on All B-52 G-H's

2. FB-111A; AMSA

Increase the number of UE FB-111A above those currently programmed. Accelerate AMSA development insofar as possible.

3. Unmanned Mini-Bomber

A force of SCAD-like aircraft vehicles could be deployed for air launch, ship launch or ground launch.

4. Unmanned B-47

There are approximately 600 stored at Davis Monthan Arizona.

SUMMARY

The restrictions in Option III, which foreclose certain U.S. safeguards options, also limit threat options open to the Soviets. We are still left, however, with a potential threat to Minuteman survivability. The only safeguards for MM survivability available under this option are:

a. Hard point defense as permitted by the agreed ABM level.

b. Launch-on-warning

c. Increase the expected deliverable force by increasing the total missile throw weight and increasing the bomber force.

OPTION IIIA, B

These options are identical to Option III with the important exception that Minuteman rebasing is permitted.

IIIA

Minuteman could be relocated to hard rock silos. The long term viability of this rebasing depends on the level of defense permitted within the agreement. Since the hard rock silos can be destroyed by high yield weapons, even a light defense would deny confident attack with single high yield (15-25 MT) RV's. For an ABM limitation below that of "Safeguard" the hard silo rebasing would not provide a confident solution if the Soviets were to develop very high accuracies. With Soviets CEP's in the neighborhood of 1000' for example, a MIRV threat would require several hard point interceptors per silo to achieve confident survivability. Because of this the viability of hard silos would be extended if the Soviet missile throw weight and/or accuracy were constrained to the current level.

IIIB

In addition to relocating to hard rock silos, the option of increasing the sea-based force with a comparable land-based reduction is available.

SUMMARY

No additional safeguards to those currently available or within the present R&D program are indicated at the present time for Option IIIB. As in Option IIA, the long range offensive missile safeguard requirements would be determined by the mix of land and sea-based force that best responds to the evolution of the Soviet threat.

With Option IIIA the requirements of Option III with respect to Minuteman survivability could evolve if low Soviet CEPs were achieved.

EFFECT OF OPTION IV

SURVIVABILITY

	POTENTIAL THREAT		SAFEGUARDS
Land-Based ICBM's	. Accurate MIRVed SS-9	Restricted or Prohibited	. Sprint defense of Minuteman
		Prohibited	. Hard rock silos . Increase in numbers of missiles . Mobility or deception
	. Accurate SS-11, 13		
	. Increase in SS-9, 11, 13	Restricted	
Sea-Based SLBM's	. Overall ASW Improvement		. SSBN defense development
	. Deployment of nuclear attack submarines	As SSBN replacement only	. ULMS
Bombers	. Increase in SLBM/SLCM	Restricted	. Dispersion . Increased Alert . Warning . ABM defense of SAC bases
	. Upgrading of SLBM/SLCM platforms and missiles		

PENETRABILITY

POTENTIAL THREAT		SAFEGUARDS
. Galosh . Tallinn ABM capability . New long range ABM . New short range ABM	Restricted	
	Prohibited	. MM III, Mk12 MIRV . MM survivability options
	As MM replacement only	. Increased land-base throw weight
	Restricted	. ABRES
	Prohibited	. Poseidon, Mk3 MIR . 14 Mk3 on Poseidon . Increased Sea-base throw weight
. Pen aid discrimination		

OPTION IV

MISSILE PENETRATION

If the deployment of MIRV's is to be monitored by unilateral means only, all flight tests of systems associated with such capability must be prohibited. Thus, limitations may have to be placed on penetration aid testing as well as further flights of the Polaris A-3 system with multiple RV's. The U.S. now has chaff deployed on some systems, however we cannot be fully confident of chaff as a penetration aid. With these restrictions, penetration confidence becomes the most critical safeguard requirement.

SAFEGUARDS WITHIN THE TREATY

1. The U.S. could continue to convert and retrofit the SSBN with Poseidon missiles. It is estimated that a lead time of 24 months would be required to equip these missiles with a single Mk-11C warhead. The chaff package, currently deployed on the MM II with this warhead, would require modification. Since it may not be possible to flight test this system in its intended operational form, it is difficult to assess at this time the confidence one can place on the reliability of the chaff to effectively hide the RV.

2. A new single RV warhead for Poseidon would take 4 years to IOC. It is estimated that a 500 cal/cm^2 hard 4 MT warhead could be thrown to a maximum range of 2500 NM.

3. Though developed and tested, the Antelope penetration aid system for the A-3 missile was not deployed. A two year to 30-month IOC would be possible for this system.

4. Minuteman III could be deployed with the Mk-11C warhead and chaff system. A 2 year slip in Minuteman III IOC is estimated.

5. A new hard RV could be developed for MM III with an IOC in 4 years.

6. A new larger Minuteman and large RV could have an IOC within 4 years with FOC in 8 years.

7. The credibility of penetration would rest with the credibility of the chaff systems. To develop higher confidence pen aid systems within the treaty, the development of a ground-based pen aid test simulator system should be studied. Such a system would consist of a full reentry simulator for decoy test and a large space chamber for midcourse simulation. It is estimated that an IOC of five years is possible.

SAFEGUARDS AGAINST SOVIET PREPARATIONS FOR ABROGATION

If the Soviets abrogate the ABM limitation with a new ABM deployment, the primary safeguards will be the Poseidon and Minuteman III (deployed with single RV's). The U.S. could continue the development of MIRV short of flight test. Retrofitting these systems at some future date with the currently programmed Mk-3 and Mk-12 MIRV systems will take approximately two years from decision to IOC.

MINUTEMAN SURVIVABILITY

The agreement would eliminate a threat to the Minuteman force if the Soviets abide by the MIRV ban, since an SS-9 MIRV represents the most immediate potential threat. However, a threat could conceivably evolve in time from several other sources, for example:

1. An accurate SS-11 together with the SS-9 force augmented by retrofitted SS-7's and 8's.

2. An accurate small missile with several deployed in each SS-9 silo and ripple launched.

3. Covert MIRV development activity which could reduce the Soviet leadtime to deploy a highly accurate MIRV after abrogation.

The potential seriousness of this threat is accentuated by the requirement for a high survivability in Minuteman to obtain a penetration capability against medium or high levels of ABM. Without Minuteman there would be a maximum of only about 400 RV's from the sea-based force arriving over the Soviet target system.

Accordingly, those safeguards for Option III are also required here. However, Option IV would enhance the survivability of the Minuteman force by prohibiting MIRVs.