V. STRATEGIC IMPLICATIONS OF RDT&E RESTRICTION

The thesis to be developed in this section is that although across-the-board restrictions on all new weapon systems developments might retard or even stop the development of those weapons and capabilities which are provocative and upset the strategic balance, such restrictions might also limit the ability of the antagonists of the cold war to implement characteristics into their strategic force structures which would lead to a more stable situation and thus a policy of blanket restrictions on the development of new weapon systems could itself be destabilizing. Therefore, any program for the restriction of new weapon system developments should be selectively applied only to the development of those weapon systems and improvements in existing systems which are either provocative or otherwise destabilize the strategic balance. This conclusion will be shown to be valid in the situations in which (1) no limitations on the deployment of missiles exists, and (2) both antagonists agree to limit the size of their forces and each maintains a finite deterrent capability.

A. The Strategic Arms Race and the Development of Strategic Doctrine

It is difficult to know the precise reasons behind the development of national doctrine. The following paragraphs attempt to rationalize the sequential changes in strategic systems in a logical manner. In the arms race which has existed since the beginning of the cold war, each improvement in weapon capabilities has elicited a response from the opponent in the form of new weapons with improved capabilities. Thus a spiraling technological arms race has resulted in which the supersonic bomber was the response to the supersonic fighter and the Mach 2 fighter was in turn a response to the supersonic bomber. In the missile age this technological race developed into one between the survivability of the missile systems against attack and their offensive capabilities against enemy missiles. The first U.S. missiles to be deployed, the Atlas D and Titan I, were soft cryogenic missiles which had a

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reaction time of 15 minutes. These missiles could be fueled and launched between the time enemy bombers crossed the DEW line and the time they reached the missile sites and thus were survivable in the face of a manned bomber attack. However, as the Soviet ICBM threat developed these missiles were replaced by hardened missiles deployed in hardened silos. This quest for survivability led to the development of the Minuteman missile which was a smaller solid fueled missile with a short reaction time and the Polaris missile which achieved its survivability by submarine basing.

Because of the lack of an effective defense against the ballistic missile the U. S. adopted a policy of deterrence as its defense policy whereby a potential attacker is threatened with unacceptable massive retaliation in the event of his aggression. While the U. S. missile buildup was in response to the developing USSR missile threat, the growing U. S. missile force similarly appeared to be provocative to the USSR and was thus interpreted by their military leaders.[15] Thus the Soviets apparently considered their missile force as a deterrent against an attack by the U. S. on the USSR, and a situation of mutual deterrence against massive attack is considered to exist. However, the Soviet missiles depended upon secrecy of location for survivability rather than upon hardness. The Soviet missiles were deployed with two launchers to a complex and two missiles to a launcher; these complexes were spaced about 4 miles apart and formed groups of three or four complexes. In this situation a well-placed 1-mt nuclear weapon would effectively negate twelve Soviet missiles since the lethal radius of a 1-mt bomb with an overpressure of 3 psi is 30 000 feet.

A major instability in the hypothesized balance of mutual deterrence, from the Soviet point of view, occurred with the development of the U-2 reconnaissance aircraft which presumably revealed the location of the Soviet missiles, made them vulnerable to a U. S. first strike, and invalidated their credibility as a deterrent. The USSR has subsequently begun to deploy their missiles in hardened and dispersed launch facilities.

[15] Sokolovsky, V. D., "Military Strategy, Soviet Doctrine and Concepts", Praeger, N. Y., 1963.

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However, above 1000 psi, increasing hardness is ineffective because the radius of the lip of the crater extends beyond the radius of the overpressure contour. If the accuracy, yield, and reliability of the opponent's missiles are such as to assure a high kill probability at a 1000 psi overpressure, increased hardening is ineffective and other methods of assuring survivability must be sought. These may include increasing the numbers of missiles to maintain numerical superiority or developing alternate basing methods such as land mobility, undersea mobility, and space basing.

Because of the effectiveness with which we were able to implement the doctrine of massive retaliation, it was thought that the Soviets might attempt a limited military provocation.* The U.S. announced, in late 1960 and 1961, a new doctrine of controlled or selective response whereby it would be possible to respond to limited Soviet nuclear provocations in a limited way and thus show our resolve to employ our strategic force without inevitably escalating a possible conflict to its ultimate limit. This modified doctrine required greater flexibility in the command and control system and in missile targeting. These requirements led to the development of Minuteman Wing VI which is an improved missile with a larger payload capability, an accuracy of 0.4 nautical mile, and can be fired against any of ten prestored targets.

As more and more missiles were deployed by the U.S. and USSR, some persons believed that the Soviet missile force could deter the use of the U.S. missile force as a response to a conventional military attack on Western Europe. The British first, and later the French, argued that since the U.S. was vulnerable to a Soviet nuclear attack, the U.S. would not use its strategic force if the USSR attacked Western Europe. Thus, both nations decided to develop their own deterrent forces, the British, for the purpose of committing the U.S. to its doctrine and the French to have an independent nuclear deterrent.

* That is, a provocation against which massive retaliation would be unjustifiable on military and political grounds.

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Because the U. S. was concerned about the dangers associated with independent nuclear forces, i. e., that the initiative to begin a nuclear war which we must participate in would pass out of our hands into those of an ally, the U. S. announced its adoption of a counterforce doctrine in the Ann Arbor speech of Secretary of Defense McNamara.[16] In this speech, the secretary announced that the U. S. was adopting a policy of initially targeting only USSR military forces in the event of a war and was avoiding striking Soviet civilian population unless driven to it by an attack on U. S. population, and hence ". . .we are giving a possible opponent the strongest imaginable incentive to refrain from striking our cities." In this statement he intended to make clear our resolve to defend our allies in the event of an attack and thus continue the credibility of our deterrent strategy.

The effective implementation of such a counterforce strategy depends upon the characteristics of the weapons available which are high accuracy, flexible targeting and effective command and control. These characteristics, however, are exactly those required to implement a first strike capability, especially if coupled with a great superiority in numbers of weapons. Thus this doctrine may well be interpreted by the USSR as an intention on the part of the U. S. to develop a pre-emptive strike capability. In the light of the current Soviet force deployment, their response may be to seek alternate basing schemes to improve survivability and also to deploy more missiles. If they adopt the latter course, then the arms race may increase its pace.

B. Technological Innovation, Strategic Capabilities, and Response

The preceding discussion has attempted to show how the need to implement a specific capability in a weapon system has led to technological innovation and how these innovations are responded to by the opponent. This process of innovation and response can be interpreted in terms of a stability

[16] New York Times, 17 June 1962.

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criterion for the dynamics of the continuing changes in the strategic forces of contending opponents. This process of the continuing development and deployment of new weapon systems can lead to a number of possible situations.

1. Arms Races

The first is a spiraling arms race in which each contender attempts to improve his own position relative to that of his opponent by either deploying more weapons or weapons of improved characteristics. There are a number of ways in which such an arms race can develop. The first is that each side believes the intentions of his opponent are aggressive and each side attempts to build up a capability greater than that of his opponent. A second way is one in which one contender has only incomplete information regarding the other's strategic capabilities and responds on the basis of the maximum estimate of his opponent's strength. A third way is one in which one side believes the other to be aggressive and implements a deterrent posture. The implementation of the deterrent posture is in turn interpreted by his opponent as a further indication of an aggressive intention, and the opponent further accelerates his arms buildup. The possibilities of such misinterpretations are enhanced in an environment in which the same weapons are used for defensive and offensive purposes, as is the case with ballistic missiles.

It is now generally realized that in order to obtain a decisive advantage over one's opponent, one must have the capability of destroying enough of one's opponent's strategic forces to reduce the damage of a retaliatory blow to an acceptable level. Such a capability implies the necessity of having a numerical superiority in delivery systems and sufficient accuracy and destructive capability so that the enemy's force can be destroyed. Furthermore, in order for such a capability to be useful, it must be used as a first strike. If one side attempts to obtain a first strike capability the other side is forced to increase the survivability of his force to the

point where he is able to maintain a deterrent capability. There are a number of ways in which one side can obtain a first strike capability over the other, one of which may be to out-spend the opponent.

2. The Unique Weapon

A second strategic situation is one in which one side develops a weapon system of a different kind. Such a situation is believed to have existed in Europe from the end of World War II to about 1952 when the Western nations possessed an effective monopoly of nuclear weapons and thereby were able to effectively deter Soviet aggression by the threat of large scale nuclear retaliation. Such a situation is always a transient one because the opponent without the new capability seeks to obtain it. In the post-war era the USSR did nothing to jeopardize their ability to obtain nuclear weapons and the Baruch Plan for the control of atomic weapons failed because of this reason, since the USSR would be giving up its desire for technological parity with the U.S. if it had agreed to the Baruch Plan. The maintenance of technological parity, even among allies, appears to be a fundamemtal axiom of international relations. If an adequate deterrent is not available for the unique weapon then its possession by an aggressive power may be decisive. One can contemplate the consequences if either Germany or the USSR had been the first to obtain nuclear weapons and had maintained that monopoly.

3. Mutual Deterrence

In this strategic situation, each side feels that it is impossible to obtain a decisive advantage over its opponent and is content with maintaining a force strong enough to deter his opponent. Such a position, if it can be achieved and maintained, can be considered as a stable and hence strategic balance. If both opponents are attempting to establish such a balance then each must be sure that it undertakes no force improvements which are interpreted as an attempt to move away from this position to a first strike position.

Furthermore, one or both sides may wish to undertake changes in its force structure which will enhance the balance and thus demonstrate to its opponent that it desires such a situation.

There are difficulties in reaching and maintaining balanced mutual deterrence. First is the problem that the estimates of what constitutes a stable situation may differ among opponents. This is particularly true if the characteristics of the weapon systems of each side are considerably different. At the present time the U.S. maintains a superiority of numbers of delivery systems whereas the USSR maintains a superiority in the deliverable yield per weapon. In such a situation, each side may maintain that the other possesses a pre-emptive capability.

The second difficulty is the pressure for technological change. This may arise from a number of sources including the desire for lower costs, improvements in performance and survivability, pressures caused by changes in allies and opponents, and the desire to break the strategic deadlock. Finally, there is the difficulty of the misinterpretation of enemy intentions. The slowdown in the rate of Soviet buildup in armament may be due to economic pressures, yet the intent to reach a first strike capability may still exist and its implementation may be merely postponed.

4. Multi-National Forces

One of the difficulties with the mutual massive deterrence posture is that it provides an umbrella under which aggression by conventional warfare can be carried out with relative impunity and thus becomes ineffective in deterring such aggression. In such a situation, an ally doubting the resolve of the nation possessing the strategic deterrent, may create its own independent nuclear forces to appear to be useful (whether really useful or not) either as a deterrent or to force the first ally to use its strategic weapons. Thus, effective control of the principal deterrent may pass out of the hands of its owner. A satisfactory solution for this situation has not as yet been found.

C. Effects of Future Technological Developments on Strategic Stability

In examining possible strategic situations it appears that the only reasonably stable one is that of mutual deterrence. It is on this basis that technological changes will be assessed. Strategic capabilities which may be acquired through technological change include improved survivability of strategic force, first strike capability, reduced collateral damage, improved intelligence, and counterforce capability. In attempting to assess these capabilities as stabilizing or destabilizing, it must be considered whether the improvement can be interpreted by the enemy as an improved first strike capability in such a way that the opponent can respond by threatening the survivability of the first force.

Improved survivability of the strategic force is considered to be stabilizing because it reduces the danger from a first strike and thus makes a nation less prone to launch a pre-emptive strike. Survivability, however, can change rapidly and thus make an invulnerable force suddenly become vulnerable. Improved accuracy and target location intelligence can destroy the survivability of hardened emplaced missiles. According to the above argument, it follows that neither side should attempt to increase the vulnerability of the opponent's forces; however, one side may use the gambit of increasing the vulnerability of his opponent's force to cause him to increase the survivability of his forces and thus reduce the motivations for pre-emption. The danger of such a gambit is that the opponent may either over-respond or misinterpret one's intent. However, each side should attempt to increase the survivability of its strategic forces and such attempts should be interpreted as defensive and stabilizing. If survivability is achieved with weapons which can be clandestinely produced and deployed so that the opponent is unsure of the size of the force, or its accuracy, which confronts him, he may be motivated to create a larger force to assure its survivability.

A first strike capability capable of reducing the damage from retaliation to an acceptable level is clearly destabilizing because it forces the opponent to increase his force size and to deploy new weapons which continues the arms race.

An attempt to develop a counterforce capability would also lead to a capability for a first strike and would probably be thus interpreted by the enemy. Consequently, the development of a counterforce capability is considered as being destabilizing unless supported by a convincing national policy of not striking first. However, there may be circumstances under which such a capability may be properly chosen regardless of stability implications; for example, the use of counterforce by the U.S. to reduce damage from those USSR forces remaining after a USSR first strike.

Accurate intelligence prevents response on the basis of overestimates of the opponent's capabilities and in this way is stabilizing. However, intelligence-gathering systems have been criticized as being destabilizing because they provide targeting information necessary for a pre-emptive strike. The stabilizing aspects of the first effect are considered to be more important than the destabilizing effect of the second and hence intelligence-gathering systems are considered as being stabilizing in the long run.

From the preceding discussion it can be concluded that those improvements which tend to increase the survivability of the strategic retaliatory force, but which do not require increases in number of weapons deployed, and systems which improve information regarding the opponent's force structure are stabilizing. Those which might yield a pre-emptive capability may be considered destabilizing subject to policy and other considerations beyond the scope of this study.

Now let us consider the effects of specific technological developments upon the strategic balance in an environment of mutual deterrence, within the limiting assumptions as given above.

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1. Ballistic Missile Developments

Possible improvements in ballistic missile systems include improved accuracy, increased survivability which may be achieved through increased hardness, land mobility, underwater mobility, long term concealed storage in a dormant state, large payload missiles, improved penetration aids, small missiles with the same or increased performance of current missiles, improved command and control systems, increased range, and flexible targeting.

a. Increased Accuracy

Improved accuracy appears to be destabilising because it forces the opponent to either deploy more missiles or to develop alternate basic schemes to maintain the same force survivability. However, this counteraction after completion may result in a position of greater "stability". The development of new basing concepts would also imply the deployment of new missiles in addition to the ones currently deployed and thus appear to be pre-emptive to the opponent, if they are also highly accurate and effective in the countermissile role. The increasing accuracy can provoke the opponent into an apparently pre-emptive position. Finally, increased accuracy may reduce total damage caused by an aggressor if that portion of his force not launched in the first strike can be destroyed by the retaliatory force.

b. Hardening

The hardening of missiles is considered to be stabilising because it increases the survivability of the missiles. However, effective hardening can only be provided to about 1000 psi overpressure and if greater hardening is required, other means of providing survivability must be sought which may include active defense systems or alternate basing schemes.

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c. Underwater Mobility

Undersea mobility is considered to be an attractive means of achieving survivability because of the extensive concealment volume afforded by the oceans. At the present time, submarines enjoy considerable safety against attack. Because the construction of submarines appears to be relatively easy to monitor there seems to be little danger of the covert deployment of submarine-launched missiles and consequently this means of achieving survivability is considered stabilizing if adequate production controls are placed on the submarines and adequate command control is always present.

d. Land Mobility

Land mobility is sometimes thought of as a means of providing survivability because of the hiding afforded. However, it is difficult to harden a mobile system beyond about 10 psi and it may be possible to completely blanket the area in which these missiles are deployed with a greater overpressure. Another difficulty with the road mobile missile concept is the fact that these systems may be covertly produced and deployed and it is difficult for the opponent to determine the threat against him; he may therefore respond on the basis of an overestimate of the number of missiles which would be destabilizing.

e. Encapsulated and Hidden Missiles

Encapsulated and hidden missiles, as discussed in Volume II, Section VI, appear to be an effective method of increasing the survivability of the missile force. However, survivability in this concept may be obtained by deploying a large number of decoys thus giving the appearance of a great many more missiles than are actually deployed. Such a system is considered to be destabilizing if it causes the enemy to consider his force to be vulnerable to attack by these missiles.

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f. Very Large Payload Missiles

The development of very large payload missiles may possibly be destabilizing. A large payload missile could be used for the delivery of a single large yield warhead, a multiple warhead, or to increase the penetration capability against an active defense system if one existed.

Since, in general, a large missile costs more than a small missile (but not proportionately so), one would expect fewer large missiles for a given expenditure. Against a numerous, highly accurate force, these would be vulnerable to first strike if fixed and even if hardened. Hence the deployment of small numbers of large missiles in fixed installations is considered to be destabilizing, unless they are supplemented by large numbers of other missiles, since they represent provocative targets.

g. Small ICBMs

The motivation for the development of a small ICBM may be to increase survivability because these missiles are easier to harden, make mobile, deploy in the hidden and encapsulated mode, or that more can be bought for a given budget level. The effects on stability have already been discussed and depend upon the method of deployment. One destabilizing aspect of small missiles is the ease with which they may be covertly produced.

h. Penetration Aids

The availability of effective penetration aids against an active defense system may be an effective means of deterring the opponent from attempting to deploy an anti-ballistic missile system. It is current thought in the U. S. that the offense has the advantage over the defense and that any foreseeable defense system can be countered. Thus, if the opponent

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is deterred from the development of an active ballistic missile defense system, the strategic balance is not upset. Consequently, the development of effective penetration aids tends to stabilize the technological arms race.

i. Command and Control Systems

Improved command and control systems with greater survivability tend to increase the survivability of the entire force and to increase the controllability of the missile force in a post-attack environment, thus enhancing the effectiveness of the surviving force in a retaliatory strike. Hence, improved command and control systems are considered to be stabilizing.

j. Improved Range

Increased range on the part of the U. S. may be used to increase the credibility of our missile deterrent against other powers such as Communist China and thus increased range can be considered as a stabilizing development from the U. S. standpoint. Greatly increased range improves survivability by allowing attack on a target from any direction. However, range improvement in Soviet ICBMs to intercontinental ranges would offer a destabilizing threat

k. Improved Targeting Flexibility

Targeting flexibility in the post-attack environment provides a number of advantages; one is that the highest priority targets of the enemy remain vulnerable in spite of weakening of the retaliatory force since the targeting list of the retaliatory force can be updated on the basis of those missiles surviving a first strike. Also, if post-attack reconnaissance information is available, the surviving missiles can be fired against unfired missiles and thus limit the potential damage in subsequent attacks. A flexible targeting capability is dependent upon the guidance system and computer capabilities and also upon the capabilities of the command

and control system. Because flexible targeting increases the capabilities of the deterrent force in the post-attack environment it should be considered as a stabilizing development.

From the preceding discussion it is concluded that increased hardness, undersea mobility, the development of penetration aids, improved command and control, targeting flexibility and extended range of the missile force all tend to enhance the deterrent capability of the missile force and are relatively stabilizing. Nearly all of these developments can be achieved without the development of a completely new missile system by improving various subsystems of the missile. However, the development of a road mobile ICBM, an encapsulated missile, a large payload missile, and small ICBMs would all require the development of a new missile system. Consequently, many of the destabilizing developments with the possible exception of improved accuracy could be restricted if the development of new missile systems could be reliably stopped.

2. Orbital Bombardment Systems

Although the orbital bombardment system does not appear to be economically feasible with currently available technology, there are a number of motivations for the development of such a system which include, first, increased survivability of the retaliatory force by basing it in space and second, reduced collateral population deaths compared with those which would result from an attack using a land-based retaliatory force. For example, an ill-advised and irrational attack on U.S. based missiles and air bases could result in almost complete destruction of the attacker's homeland by the surviving U.S. retaliatory force, yet there would be tens of millions of U.S. casualties. A similar attack on a U.S. space-based force would not result in U.S. population deaths. A third motivation is diversification of the threat, while a fourth motivation is the possibility that positive command and control may be more easily achieved than for other basing systems.

It is currently thought that an unmanned, low altitude OBS is not likely to be deployed because of its low reliability and also because it may be relatively vulnerable to attempts to negate or destroy it. Because of the problems of reliability and vulnerability, an effective OBS is considered to be a manned system deployed in a high altitude orbit, perhaps with the capabilities for evasion or self-defense in the event of attack. If such a system can be made sufficiently invulnerable to attack it may represent an effective deterrent force and thus might be considered as a stabilizing influence on the strategic balance

3. Anti-Ballistic Missile and Anti-Satellite Systems

Anti-ballistic missile systems fall into two classes: point defense systems and area defense systems. Point defense systems are those used to defend a single installation such as a missile launcher or a command center whereas area defense systems are used to defend extended target areas such as cities or larger areas Active point defense systems may become attractive as the accuracy of the opponent's missiles increases in order to maintain the survivability of critical installations such as command centers. Area defense systems have been criticized as being destabilizing because the possessor might be able to launch a pre-emptive attack while parrying much of the effective retaliatory strike on his population. However, since it is believed that these systems can be relatively easily countered by the use of penetration aids, it appears that active defense systems cannot decisively defeat a ballistic missile attack at the present time. However, the development of such a system does stimulate the development of penetration aids by the opponent.

Anti-satellite systems would probably be deployed against orbital bombardment systems although here again the question of use of decoys by the bombardment system arises. A nation would probably wish to continue the research and exploratory development of these systems just

as is the case of the AICBM. If effective, they would destabilize a situation in which an orbital bombardment system constituted a major portion of the retaliatory force.

4. Nonweapon Military Space Systems

Nonweapon military space systems include reconnaissance, warning, and communication satellites and satellite inspection systems. These systems, particularly warning and reconnaissance satellites, are useful in preventing pre-emption and maintaining stability. The reconnaissance satellite affords one means of gaining information required for accurate estimates of the opponent's force structure and thus is considered stabilizing. Early warning satellites such as Midas are considered stabilizing to the extent that they reduce the effectiveness of a first strike.

Satellite inspector systems may be useful in determining whether the opponent has deployed provocative systems in space and are stabilizing to the extent that the information gained prevents surprise.

Communication satellites used for military purposes might be part of a global command and control system and could enhance the military capabilities of a nation at all levels of military conflict. In times of peace, communication systems are not generally vulnerable to attack and sabotage and there seems to be little danger that these systems would become subject to attack under normal conditions. Furthermore, communication satellites can be used for both peaceful and military purposes and in some cases the same satellite can be used for both purposes. These systems are considered stabilizing in conjunction with a stable force because they improve force effectiveness and control.

The above analysis was made in a situation in which there are no restrictions on the deployment of strategic weapons. However, the discussion is generally applicable to the situation in which there are limitations

on the deployment of strategic weapons. If a situation of limited or minimal deterrence is postulated in which each side maintains an agreed-upon number of strategic weapons the stability of this situation is enhanced as the survivability of the forces is increased

D Effects of RDT&E Restrictions on Strategic Capability

The effects of RDT&E restrictions on future strategic capabilities and stability will depend upon the time the restrictions are implemented The implementation of broad RDT&E restrictions on development programs at the present time might have an asymmetric effect on the weapons technology of the two major antagonists because of the varying emphasis placed on weapon characteristics It would prevent the U S from achieving those improvements in its force structure which would enhance the deterrent capability of its force structure and hence strategic stability [illegible] the imposition of across-the-board RDT&E restrictions [illegible] force improvement is completed would decrease our potential capabilities for deterrence The stability effects of such restrictions on the USSR are not known because of the limited knowledge regarding their future plans.

Table V-1 summarizes the effects of certain systems on the strategic balance For each system improvement the table shows earliest estimated initial operational capability (IOC) dates for both the U S and the USSR, the added strategic capabilities which these developments might afford, and the possible responses which the enemy might take to the development From the table it is apparent that any new development has the potential of requiring technological response and new weapons deployment For example increasing the hardness of one's missile force may cause the opponent to increase the accuracy of his force, this increase in accuracy may cause the first nation to consider the development of a new kind of system which has increased survivability such as an ORS or to increase the size of his existing missile force To dampen this interaction, each nation should recognize that there are certain activities whic

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Table [illegible]-1 Strategic Capabilities and Possible Responses of New Developments

System or System Characteristics	Possible IOC Date U.S.	Possible IOC Date USSR	Added Strategic Capability	Possible Responses
Ballistic Missiles				
[illegible]	[illegible]	[illegible]	Increased survivability	Increased accuracy
[illegible]	[illegible]	1964-71	Pre-emptive strike (1)	Land mobile ICBM, increase force size
[illegible]	1975	1975	Increased survivability (1)	Hidden and encapsulated ICBM
[illegible]	1972	1972	Counterforce or pre-emptive strike	Submarine basing, OBS, increase force size
[illegible]	[illegible]	[illegible]	Counterforce and improved survivability	Submarine basing, OBS, increase force size
[illegible]	[illegible]	[illegible]	[illegible] (1)	Increase force size and survivability
[illegible]	[illegible]	[illegible]	Increased [illegible] (1)	Increase force size [illegible] survivability
[illegible]	[illegible]	[illegible]	Maintain force [illegible]	Retard ABM development
[illegible]	A	[illegible]	Increased survivability	Respond in kind
[illegible]				
[illegible]	[illegible]	[illegible]	Pre-emptive strike or retaliation	Develop anti-satellite system
Manned [illegible]	[illegible]	[illegible]	[illegible] and reduce collateral damage	Develop similar system
[illegible] Ballistic Missile System				
Point defense		[illegible]	Increase [illegible]	Develop penetration aids
Area defense		[illegible]	Protection of targets	Develop penetration aids
Anti-satellite System	[illegible]	[illegible]	Space defense capability	Improve OBS survivability
Satellite Inspection System	[illegible]	[illegible]	Intelligence gathering	Stop development of OBS
Warning Satellites	[illegible]	[illegible]	Reduce damage	Anti-satellite system
Reconnaissance satellites	A	A	Intelligence gathering	Anti-satellite system
Communication satellites	A	[illegible]	Improved global command and control	Anti-satellite system

[illegible]
A [illegible]
(1) [illegible] and if enemy force location is known

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are not necessarily provocative and should not incur response. These activities include increasing the survivability of a limited missile force.

An examination of the IOC dates for these systems and improvements shows that if across-the-board RDT&E restrictions were imposed in 1965 the capabilities for improved survivability through Polaris type missiles for the USSR, active point defenses, and targeting flexibility would not be achievable. By 1970 most of these improvements could be implemented but hidden and dispersed missiles, very small ICBMs, manned orbital bombardment systems, and anti-ballistic missile and anti-satellite systems would require completion of their development programs. However, by 1970 new concepts may be devised or invented which, if implemented into the force structure, could materially change the strategic balance.

It is concluded that while some technological developments could be provocative and destabilizing there are others which should be undertaken to improve the security of deterrent forces These latter developments would appear to merit first priority in weapons development programs of all nations

The fact that both the Partial Nuclear Test Ban Treaty and the U N Resolution Prohibiting Weapons of Mass Destruction in Space were consummated and the fact that the USSR is apparently taking steps to harden its missile force may be indicators that both nations are interested in achieving a strategic balance and will refrain from the development and deployment of those weapon systems which are provocative and destabilizing The effects of attempting to impose blanket restrictions on weapons development programs at the present time might retard or even limit the ability of both sides to achieve those developments which are considered stabilizing and hence be a destabilizing act in itself It is concluded that blanket restrictions or prohibitions on military RDT&E are currently undesirable