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Briefly reviewing the options, we see that bombers are not constrained in any case. Option I does not limit submarine-launched ballistic missiles (SLBMs), so we show a Soviet buildup to 1262 SLBMs. Option II permits mobile ICBMs and we show 100 Soviet mobile ICBMs deployed in 1978. Option II and Option III are practically identical as far as characteristics we measure in our analysis are concerned. In the analysis, we show our results for Option III and they are representative of Option II as well. MIRVs and mobile land-based systems are banned in Option IV.

(Chart 2)

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

Operational ABM Launchers	United States			Soviet Union			
	Phase I SAFEGUARD	Phase II SAFEGUARD	Options I, II, III & IV	High and Low NIFF ^a Projections w/o Agreement	Option		
Area	60	465	(Level	464-1064	(Level		
Terminal	56	414	Varies)	0- 600	Varies)		

Chart 2 compares U.S. and Soviet missile defenses. Without an agreement, we have the programmed SAFEGUARD program. The high estimate of the Soviet missile defense is a total of 1664 area and terminal interceptors. In our analysis, we examined the effect of varying the ABM level on each side between 0 and 5000 mixed area and terminal interceptors.

Cost savings are not great, in the short run, for any of the options we considered. The only significant real cost savings for the U.S. would occur after several years if under the agreement we could forego deploying new systems. The Soviets might save slightly more in the short run under an agreement if the systems which they ceased deploying were systems which they had not planned to level off.

(Chart 3)

COMPARISON OF INTERCONTINENTAL U.S. AND SOVIET ALERT FORCE LOADINGS (1978)^a

Alert Loadings	United States		Soviet Union				
	Programmed Force, Options I, II, and III	Option IV	High NIFF	Option I	Option II	Option III	Option IV
Weapons	5400	2400	2200	3700	3100	3000	1200
Equivalent Megatons Missile Pay- load (Klbs)	[REDACTED]						

^{a/} Does not include intermediate- or medium-range ballistic missiles or submarine-launched cruise missiles. Payload figures (Klbs) do not include bombers.

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A better comparison of the opposing offensive forces can be made by examining the loadings of the missiles and bombers which are on normal day-to-day alert. These are shown in the next table, where it is seen that the U.S. would have more alert weapons than the Soviets under each option.

In terms of alert equivalent megatons, which is a commonly used index of comparison, U.S. and Soviet forces are about equal under Option IV, but the Soviets have slightly more than the U.S. in Options I, II, and III. For all options, the Soviets have more alert missile payload because they have deployed the large SS-9 booster. Improvements in missile payloads were left unconstrained in the analysis. Thus, under Options III and IV, either side could increase its offensive missile payload by replacing missiles in existing silos with new missiles capable of delivering greater throw-weight; under Options I and II, they could do so by replacing existing launchers with launchers capable of holding larger missiles. Offensive payloads could also be affected significantly by changes in alert rates or total numbers of bombers.

These static comparisons, while descriptive, do not show how well either side's forces could perform its mission under each package. We have made an extensive analysis of the ability of the U.S. and Soviet forces to deter general nuclear war and their ability to limit damage if deterrence should fail and a nuclear war should start. These results may be summarized as follows:

The primary measure of our ability to deter nuclear war is the retaliatory capability of our strategic forces. We make very pessimistic assumptions to measure this capability. We assume that the Soviets are in a generated alert posture and that they make a surprise attack with all available missiles on our forces, which are only on day-to-day alert. The Soviets use all of their offensive missiles in this first strike, withholding only their bombers to threaten our cities. The United States retaliates with its surviving missiles and bombers in an attack against Soviet cities. Only Soviet fatalities from prompt nuclear effects are included. Furthermore, even though there is no technical reason to believe that we cannot develop high-confidence missile penetration aids against the Soviet AEW during the time period under consideration, we assumed that in the retaliatory strike U.S. penetration aids were wholly ineffective. Under these assumptions, the capability to kill 30% of the Soviet people from blast effects alone would correspond to destruction of the 190 largest Soviet cities and over 50% of the nation's industrial capacity.

The following chart shows U.S. retaliatory capability, both in the absence of an agreement (U.S. programmed forces vs high NIPP Soviet forces) and for the various arms control options analyzed.

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(Chart 4)

U.S. RETALIATION CAPABILITY ^{a/} - 1978
(Percent of Total Soviet Population Killed by Immediate Nuclear Effects)

	<u>Under Agreement</u>					<u>No Agreement</u>
	<u>(Level of Area AEMs)</u>					
	<u>0</u>	<u>200</u>	<u>500</u>	<u>1000</u>	<u>2000</u>	
U.S. Programmed Forces vs Soviet High NIFP						40
Package I	41	41	39	37	34	
Package III	40	40	39	37	34	
Package IV (MIRVs Banned)	38	33	29	25	24 ^{b/}	

a/ U.S. missile penetration aids were assumed to be wholly ineffective.

b/ Only strategic bombers make this contribution.

The above chart shows that U.S. retaliatory capability remains high, both without an agreement and under all of the options examined, at area AEM levels below 1000. The U.S. capability could be somewhat lower under agreements permitting AEM levels over 1000, particularly for Option IV. Under Option IV, with medium AEM permitted, there are 7-10 percent fewer prompt Soviet deaths from U.S. retaliation than under Option III. This is because without MIRVs fewer missile warheads penetrate the Soviet AEM defense and, thus, in the calculations, there is less destruction of Soviet towns of under 200,000 population. At high levels of permitted AEM defense under Option IV, the U.S. retaliatory capability would rest on significant contributions from our bomber force if our missile penetration aids did not work. Thus, at high levels of permitted AEM deployment we would have lower confidence that there was redundancy in our retaliatory forces.

In some cases, retaliatory capabilities may not be a sufficient measure of the power to prevent nuclear war. For example, if the Soviets felt that significantly fewer Soviets would die in a nuclear war if they struck first, then there could be times, in a crisis, when they might consider striking first. This tendency would, of course, be limited if the Soviets knew they would suffer very high fatalities even by striking first. As the above discussion of U.S. retaliatory capability indicates, we can assure with or without any of the optional agreements that they would suffer such fatalities.

(Chart 5)

SOVIET INCENTIVE TO STRIKE FIRST
Reduction in Soviet Fatalities by Soviet First Strike (1973) a/

	<u>Under Agreement</u>		<u>No Agreement</u>
	<u>(Level of Area AEMs)</u>		
	<u>0</u>	<u>500</u>	
U.S. Programmed Forces vs Soviet High NIPP			-9
Package I	3	-2	
Package III	0	-5	
Package IIIB (Superhardening of Silos Permitted)		-1	
Package IV (MIRVs Banned)	-6	-8	

a/ Side striking first uses its forces in such a way as to try to maximize the difference between its fatalities and those on the other side.

Of course, we have no confidence that the Soviets would calculate precisely these results, although the draft report on NSM 24 states that in the Soviet classified literature it is reported that some sorts of Soviet calculations are done and that limiting damage to the Soviet Union is the criterion which the Soviets emphasize. The trend is clear, at least under our own calculations. With no agreement and under most of the cases examined, the Soviets could not reduce their fatalities by striking first and in many cases they would increase them by doing so (this is indicated by the negative numbers).

(Chart 6)

U.S. DAMAGE LIMITING
Projected U.S. Deaths (In Millions) from Nuclear War in 1978 a/

	<u>Under Agreement</u>		<u>No Agreement</u>	
	<u>(with 200 Area AEMs)</u>			
	<u>U.S. 1st Strike</u>	<u>Soviet 1st Strike</u>	<u>U.S. 1st Strike</u>	<u>Soviet 1st Strike</u>
U.S. Programmed Forces vs Soviet High NIPP			87	139
Option I	123	141		
Option III	105	141		
Option IV (MIRVs Banned)	122	140		

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

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The above chart shows that the U.S. cannot effectively limit damage to itself with or without an agreement. At a level of 200 Area ABMs, U.S. deaths would be over 100 million whether we struck first or second. Even at the highest level of ABM deployment (5000 interceptors), we would suffer about 100 million deaths in the case of a Soviet first strike and about 30-50 million deaths if we should strike first. We can see then that damage limiting would not be a feasible U.S. objective under the options examined. This is because the options permit both sides to maintain high retaliatory capabilities which precludes significant damage limiting for each side.

We have been discussing the calculations which help indicate how U.S. objectives would be affected by the options examined. We are, of course, less certain that we know how the Soviets would view these options, but it is possible that if a trend is quite significant in our calculations it may be clear enough in any Soviet analysis that it would be noticed.

To calculate the Soviet retaliatory capability, we assume that U.S. forces are generated and strike first in an all-counterforce strike using missile penetration aids. Soviet forces are on day-to-day alert. Although the CIA did not project penetration aids for Soviet forces, pen aids would not be used in any case in order to give a "worst case" estimate for the Soviets.

(Chart 7)

SOVIET RETALIATION CAPABILITY - 1973 a/
 (Percent of Total U.S. Population Killed by Prompt Nuclear Effects)

	<u>Under Agreement</u>					<u>(No Agreement)</u>
	<u>(Level of Area ABMs)</u>					
	<u>0</u>	<u>200</u>	<u>500</u>	<u>1000</u>	<u>2000</u>	
U.S. Programmed Forces vs Soviet High NIFP						33
Option I	51	47	41	25	4	
Option III	43	36	23	4	4	
Option IV (MIRVs Banned)	54	49	40	15	4	

a/ U.S. uses missile penetration aids.

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With no agreement, the high NUFP Soviet area ABM level is just over 1000 in 1978. The Soviet retaliatory capability is lower under Options I, III, and IV at a permitted level of 1000 area ABMs than it is without an agreement. With lower ceilings on ABMs, the Soviet retaliatory capability increases since more of their missiles would penetrate the lower U.S. ABM screen, assuming they have no penetrations aids.

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 chart lists some hedges that are available to us and the options under which they are permitted:

(Chart 8)

<u>Hedges</u>	<u>Permitted for Options</u>
Increase bomber alert rate	All
Increase number of SCABs 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 SLEMs	I

The report of the Verification Panel indicates that we can with high confidence detect relatively low levels of Soviet cheating in numbers of offensive or defensive weapons. In the analysis, we 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; our capability is most secure, however, at low levels of ABM deployment. Upon entering an agreement, we will pursue those hedges that are required in order to be able to respond to evidence of Soviet cheating within the leadtime necessary to maintain our retaliatory capability.

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We also examined the survivability of our land-based ICBMs. The analysis of this question is really inextricable from the question of MIRVs and ARM levels.

Inaccurate MIRVs are primarily a device to penetrate area or terminal ARM defense. But it is possible and even likely that advancing missile technology will enable both sides to develop accurate MIRVs. In that case, accurate MIRVs could provide a first strike counterforce potential that makes the opponent's hardened ICBM sites more vulnerable. Although improved accuracies will increase the probability that a single warhead can kill a hardened site, permitting MIRVs allows warheads from one booster to attack several sites and thus provides the capability to attack more targets and to cross-target. This can increase the damage in a counterforce strike. There are three possible measures which reduce the vulnerability of our land-based ICBMs: a MIRV ban, superhardening of silos, and hard-point ARM defense of silos. Under an agreement which banned MIRVs, neither side would be concerned that an accurate MIRV threat would force it to take additional steps to protect its ICBMs in the near future. Eventually, however, payload and accuracy improvements could increase the threat to ICBM survivability even without MIRVs. Each side may wish to be able later to take steps such as superhardening, replacing ICBMs with SLBMs, or increasing terminal ARM defense of silos in order to avoid having strategic forces which might be vulnerable to a first strike.

The vulnerability of our SLBMs is quite different. They may 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 insure 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. 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. An agreement should permit our eventually taking steps to maintain their survivability.

The present analysis excluded consideration of bombers and air defenses for several reasons. We do not believe that bombers are a major threat to stability since they normally are not planned for use in first strikes against time-urgent targets such as ICBM sites. Defining "strategic bomber" in a way which simply and clearly distinguishes it from other types of aircraft is very difficult. Even if there were agreement on the bomber and air defense forces to be limited, verifying compliance would be difficult because of the mobility of the aircraft. Finally, 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 very important and the problems of definition and verification are even greater for characteristics than for the systems themselves.

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Nevertheless, bomber and air defense limitations might have to be considered because the Soviets might insist on it, or because we might want to limit air defense radars to help prevent their clandestine use for APM defense and bomber limits might be implied by these air defense limits.

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 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 missile forces.

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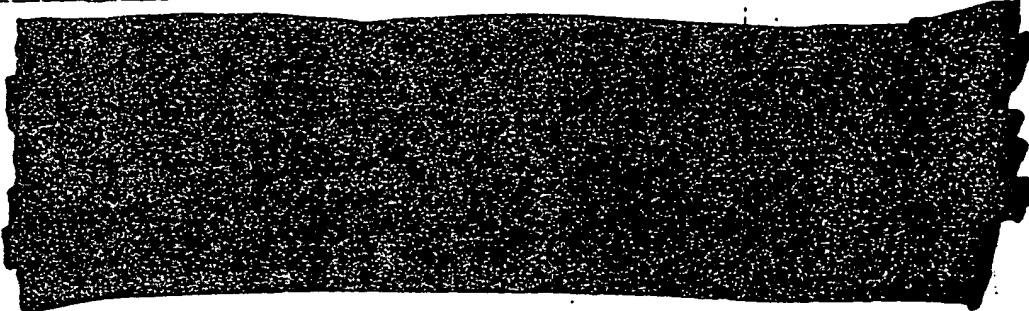
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DAMAGE CALCULATIONS (FY 78)

1. U.S. COUNTERFORCE CAPABILITY. Under Option III with 500 area AM, the U.S. could obtain the following by striking first with all missiles against Soviet ICBMs and all bombers against Soviet cities.

<u>TARGET</u>	<u># ATTACKED</u>	<u>% KILLED OF TOTAL</u>
Soft ICBM	136 Launchers	100%
Hard ICBM	1164 Launchers	77%
Cities	439 Cities	29% of Soviet Population

2. U.S. WEAPONS CHARACTERISTICS:

<u>WEAPON</u>	<u>RELIABILITY</u>	<u>CEP</u>	<u>YIELD</u>	<u>PROB. OF KILL</u>	
				<u>SOFT FT.</u>	<u>HARD FT.</u>
Titan					
SS II					
SS III					
Poseidon					

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ISSUES FOR ANALYSIS

PACKAGES OF OFFENSIVE FORCES

- o MIRV BAN

ASM LEVELS

- o 0 - 500
- o 500 - 1000
- o ABOVE 1000

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ANALYSES DONE

- o FORCE COMPARISONS
- o RETALIATORY CAPABILITIES
- o DAMAGE-LIMITING CAPABILITIES
 - o DIFFERENCES WERE NEGLIGIBLE OVER WIDE RANGES
- o HEDGES TO CHEATING

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PACKAGE I

- o FIXED ICBMS
 - FREEZE AT PRESENT LEVEL
 - RELOCATION AND ALTERING SILOS PERMITTED
- o MOBILE ICBMS
 - BAN
- o IRBMS AND MRBMS
 - FREEZE AT PRESENT LEVEL
 - RELOCATION OR ALTERING EXTERIOR OF SILOS BANNED

SLBMs (AND OTHER SEA-BASED OFFENSIVE MISSILES) - UNCONSTRAINED

- o MIRVs
 - UNCONSTRAINED
- o BOMBERS AND AIR DEFENSES
 - UNCONSTRAINED
- o ABMS
 - LEVEL VARIED

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PACKAGE II

SAME AS PACKAGE I, EXCEPT

- MOBILE ICBMS: PERMITTED WITHIN FREEZE OF TOTAL NUMBER OF ICBMS AT PRESENT LEVEL
- SLBMS: FREEZE AT PRESENT LEVEL

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PACKAGE III

- o FIXED ICBMS
 - FREEZE AT PRESENT LEVEL
 - RELOCATION OR ALTERING EXTERIOR OF SILOS BANNED
- o MOBILE ICBMS
 - BAN
- o IRBMS AND MRBMS
 - FREEZE AT PRESENT LEVEL
 - RELOCATION OR ALTERING EXTERIOR OF SILOS BANNED
- o SLBMS
 - FREEZE AT PRESENT LEVEL
- o MIRVS
 - UNCONSTRAINED
- o BOMBERS AND AIR DEFENSES
 - UNCONSTRAINED
- o ABMS
 - LEVEL VARIED

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PACKAGE IV

SAME AS PACKAGE III, EXCEPT

- MIRVs: TESTING AND DEPLOYMENT BANNED
- ABMs: LEVEL VARIED, BUT ONLY RELATIVELY
LOW LEVEL FEASIBLE

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Hedges	Permitted for Options
INCREASE BOMBER ALERT RATE	ALL
INCREASE NUMBER OF AIR-TO-SURFACE MISSILES 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
DEPLOY LARGER MISSILES IN SILOS	ALL

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OTHER ISSUES

- VULNERABILITY OF LAND-BASED ICBMS
- ACCURATE MIRV THREAT
- BOMBERS AND AIR DEFENSES
- UNCONSTRAINED

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Projected U.S. Deaths (Percent) from Nuclear War in 1978 a/

	<u>Under Agreement</u> (with 500 Area ABMs)		<u>No Agreement</u>	
	U.S. First Strike	Soviet First Strike	U.S. First Strike	Soviet First Strike
U.S. Programmed Forces vs. Soviet High NIPP				
Option I	50	60	37	59
Option III	40	60		
Option IV (MIRVs Banned)	46	58		

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

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CHARTS FOR
PERMANENT
DISPLAY DURING
BRIEFING

SUMMARY OF PACKAGES

	ICBMs		SLBMs	MIRVs
	FIXED	MOBILE		
PACKAGE I	FREEZE	BAN	UNCONSTRAINED	UNCONSTRAINED
PACKAGE II	FREEZE TOTAL		FREEZE	UNCONSTRAINED
PACKAGE III	FREEZE - NO ALTERATIONS	BAN	FREEZE	UNCONSTRAINED
PACKAGE IV	FREEZE - NO ALTERATIONS	BAN	FREEZE	BAN

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SOVIET DAMAGE LIMITING
Projected Soviet Deaths (Percent) from Nuclear War in 1978 a/

	<u>Under Agreement</u> (with 500 Area ABMs)		<u>No Agreement</u>	
	U.S. First Strike	Soviet First Strike	U.S. First Strike	Soviet First Strike
U.S. Programmed Forces vs Soviet High NIPP				
Option I	48	46	47	49
Option III	47	46		
Option IV (MIRVs Banned)	43	44		

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

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U.S. RETALIATORY CAPABILITY - 1978

Percent of Total Soviet Population Killed by Immediate Nuclear Effects

	Level of Area ABMs Under Agreement					No Agreement
	0	200	500	1000	2000	
U.S. PROGRAMMED FORCES vs. SOVIET HIGH NIPP						
OPTION I	41	41	39	37	34	40
OPTION II	40	40	39	37	34	
OPTION III (MIRVs BANNED)	38	33	29	25	24 ^{a/}	

^{a/} Only strategic bombers make this contribution.

SOVIET RETALIATORY CAPABILITY - 1978

Percent of Total U.S. Population Killed by Immediate Nuclear Effects

	Level of Area ABMs Under Agreement				No Agreement
	0	200	500	1000	
U.S. PROGRAMMED FORCES VS. SOVIET HIGH NIPP					
OPTION I	51	47	41	25	4
OPTION III	43	36	23	4	4
OPTION IV (MIRVs BANNED)	54	49	40	15	4

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COMPARISON OF

PROJECTED U.S. AND SOVIET ALERT FORCE LOADINGS (1978)

Alert Loadings	United States		Soviet Union				
	Programmed Force (w/o Agreements), Options I, II, III	Option IV	High NIPP (Without Agreement)	Option I	Option II	Option III	Option IV
WEAPONS	5400	2400	2200	3700	3100	3000	1200
EQUIVALENT MEGATONS	2200	2300	2800	3750	3000	3000	2350
MISSILE PAY- LOAD (KLBS)	2700	1750	6400	5950	5350	4850	5150
TOTAL FORCE PAYLOAD (BOMBERS AND MISSILES)	10700	9700	7100	6700	6100	5600	5900

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

Operational Vehicles	United States		Soviet Union			
	Programmed Force (w/o Agreement), Options I, II, III, IV	High NIPP (Without Agreement)	Option I	Option II	Option III	Option IV
INTERCONTINENTAL BOMBERS (not limited)	345	50	50	50	50	50
SOFT ICBMs	0	0	0	0	136	136
HARD ICBMs	1027	1346	1296	1198	1164	1164
MOBILE ICBMs	0	150	0	100	0	0
SOFT IR/MRBMS	0	0	546	546	546	546
HARD IR/MRBMS	0	485	135	135	135	135
MOBILE IR/MRBMS	0	200	0	0	0	0
SLBMs	656	830	1262	462	462	462
LONG RANGE CRUISE MISSILES	0	0	0	254	254	254

ABM Phase I a/ SAFEGUARD FULL/a/ SAFEGUARD
 • AREA 60 465 464-1064
 • TERMINAL 56 414 0-600
 LEVEL VARIES

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

Operational Vehicles	United States		Soviet Union			
	Programmed Force (w/o Agreement), I, II, III, IV	High NIPP (Without Agreement)	Option I	Option II	Option III	Option IV
INTERCONTINENTAL BOMBERS (not limited)	345	50	50	50	50	50
SOFT ICBMS	0	0	0	0	136	136
HARD ICBMS	1027	1346	1296	1198	1164	1164
MOBILE ICBMS	0	150	0	100	0	0
SOFT IR/MRBMS	0	0	546	546	546	546
HARD IR/MRBMS	0	485	135	135	135	135
MOBILE IR/MRBMS	0	200	0	0	0	0
SLBMS	656	830	1262	462	462	462
LONG RANGE CRUISE MISSILES	0	0	0	254	254	254

ABM	Phase I a/		LEVEL VARIES
	SAFEGUARD	FUEL/A/ SAFEGUARD	
• AREA	60	465	464-1064
• TERMINAL	56	414	0-600