SECRET

MASTER
3
Sanitized
ag 1-5-83

DRAFT
MEMORANDUM FOR THE PRESIDENT

RECOMMENDED FY 1965-FY 1969 STRATEGIC RETALIATORY FORCES

FOI CASE NO. 80-DF01-967

Document 3 of 8 Documents

Excised Under the Provisions of (The Freedom of Information Act) 5USC552 (b) (1)

Date: December 6, 1963
Series "C"
CCS X-7433B
Page 1 of 39 pages
Copy ___ of 200 copies

#333

DRAFT
December 6, 1963

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Recommended FY 1965-FY 1969 Strategic Retaliatory Forces (U)

I have recently completed my review of the long-range nuclear delivery forces and their associated support for FY 1965-FY 1969. The program recommended will form the basis for the preparation of the FY 1965 Budget. This memorandum summarizes the main factors I have taken into consideration in determining United States requirements for these forces.

I believe we should adopt, for planning purposes, the force structure summarized in the table on page two. Where they differ from my recommendations, the forces proposed by the Air Force are shown beneath mine in parentheses. In particular, I recommend:

1. Approval, in FY 1965, of an increase in the total Minuteman force level of 50 missiles (to 1,000), at a total procurement cost of $250 million, of which $167 million will be funded in FY 1965.

2. Retrofit of 400 of the 800 missiles in the first five Minuteman Wings with the Improved Minuteman at a total procurement cost of $279 million of which $130 million will be funded in FY'65.

3. Approval of an extensive ICBM reliability improvement program at a 1965 cost of $115 million. The eventual costs will depend on the extent of the program. They are now estimated to be about $537 million over FY 1965-FY 1969.

4. Phasing out of 27 Atlas "D" ICBM's in FY 1965 instead of FY 1968, phasing out 27 Atlas "E" ICBM's in FY 1967, and phasing out 54 Titan I ICBM's in FY 1968, for a total estimated savings of $209 million over FY 1965-69.

5. Retrofit of the five A-1 Polaris boats with A-3 missiles. Disapproval of the proposed retrofit of the thirteen A-2 boats with A-3 missiles, for a FY 1965-69 saving of $425 million, of which $110 million is realized in FY 1965.

6. Disapproval of the recommendation of the Chief of Staff of the Air Force for procurement of 355 additional Hound Dog missiles at a cost of $398 million.

7. Disapproval of the recommendation of the Chief of Staff of the Air Force for expenditure in FY'65 of $78 million on development of a new manned strategic bomber.

8. Continuation of a related classified program discussed in a separate enclosed memorandum.

In addition, I recommend provision in the FY 1965 Budget for: studies of alternative advanced manned strategic aircraft; continuation of conceptual studies leading to an advanced ICBM system and an advanced sea-based deterrent system; and continuation of the development of the MRBM, which will be discussed in my memorandum on Research and Development.

RECOMMENDED AND SERVICE-PROPOSED FORCES a/ b/

	End-Fiscal Year								
	1961	1962	1963	1964	1965	1966	1967	1968	1969
Bombers:									
B-52	555	615	630	630	630	630	630	630	630
B/E-47	900	810	585	450	225				
B-58	40	80	80	80	80	80	72	72	66
Total	1495	1505	1295	1160	935	710	702	702	696
Air-Launched Missiles:									
Hound Dog	216	460	580	580	551	522	522	493	493
Surface-to-Surface Missiles:									
Atlas	28	57	126	126	99	99	72	72	72
Titan		21	68	108	108	108	108	54	54
Minuteman			150	600	800	750	610	480	400
						(780)	(700)	(620)	(540)
Imprv.Minuteman						200	390	620	800
						(170)	(550)	(780)	(860)
Polaris	80	96	144	288	464	560	656	656	656
Total	108	174	488	1122	1471	1717	1836	1882	1982
							(2086)	(2182)	(2182)
Other:									
Quail	224	392	392	392	392	392	392	392	392
KC-135	400	440	500	580	620	620	620	620	620
KC-97	600	580	340	240	120				
RC-135			3	3	4	13	13	13	13
RB-47	90	45	30	30	30				
Thor	60	60	60						
Jupiter	45	45	45						
Regulus	17	17	17	17	9				
PACCS:									
KC-135			17	17	17	17	17	17	17
B 47		18	36	36	36	36	36	36	36
Alert Force Weapons: c/									
Weapons	1074	1512	2184	2689	2765	2785	2753	2854	2930
							(2966)	(3109)	(3100)
Megatons	1771	2710	3996	5130	5162	5148	5036	5008	5077
							(5292)	(5314)	(5281)

a/ The forces proposed by the Secretary of the Air Force, where different from the Recommended Forces, are shown in parentheses.

b/ The Multi-Lateral Force (MLF) is still under discussion with our NATO Allies. Assignment of nuclear weapons of the U.K., France, or a "Multi-Lateral Force," to NATO in accordance with the terms of the Nassau Pact, may lead to adjustments in the U.S. force structure.

c/ Bombers have flexibility in the choice of gravity bombs and yields. For purposes of this table, average planned loadings of 1.5 weapons for the B-47, 3.3 weapons and MT for the B-52's, and 3 weapons and for the B-58's are assumed. Beginning in FY 1962, 50% of the B-52's, 55% of Polaris, and 85% of the ICBM's on operational launchers are assumed to be on alert or on-station. An additional 12% of the Polaris force would be in-transit to patrol areas.

The estimated total obligational authority required to procure and operate these forces is shown in the following table.

TOTAL OBLIGATIONAL AUTHORITY BY FISCAL YEAR [a]
(Billions of Dollars)

	1962	1963	1964	1965	1966	1967	1968	1969	1965-1969
Prev. Approved	9.11	8.53	7.29	5.07	4.32	3.59	3.30	2.99	19.27
SecDef Recom.			7.53	5.34	4.35	3.81	3.16	2.76	19.42
SecAF Proposed			7.52	6.09	5.34	3.81	3.24	2.79	21.27
C/SAF Proposed									25.12

The Strategic Retaliatory Forces I am recommending are considered to be adequate by the Chairman, Joint Chiefs of Staff, the Chief of Staff, U.S. Army, the Chief of Naval Operations, and the Commandant of the Marine Corps. The results of their review of my recommended forces were summarized as follows:

"8. Recognizing that, in the time frame considered, it is not possible to assure the limiting of damage, in loss of life, to the United States to a level below the criterion suggested by the Secretary of Defense, we consider that:

"a. A vital first objective to be met in full by our strategic nuclear forces should be the assured capability of destroying singly, or in combination, the Soviet Union and the Communist satellites in Europe as national societies. In combination with theatre nuclear forces, they should be able to impose adequate punishment on Red China for nuclear or nonnuclear aggression.

"b. Further, we should maintain the capability of conducting composite strikes, dividing our effort between urban/industrial and military targets according to the circumstances of pre-emption or retaliation. While always assuring that the objective in (a) above is fully satisfied, we should provide for counter-force effort upto the point at which further weight of effort ceases to be remunerative or produce significant added damage-limiting results. These weapons would be used, in case of retaliation, to destroy Soviet weapons not yet launched from known locations against the United States, or in case of pre-emption, to provide a first strike option of reasonable size against the Soviet military targets.

a/ These and all other cost estimates in this memorandum are preliminary, and are subject to further refinement. The figures for General LeMay's proposal exclude the cost of a new manned strategic bomber.

"9. It is our view that the strategic force structure set forth in your draft memorandum for the President provides appropriately for the foregoing objectives."

The Chief of Staff, USAF, recommends 1,950 Minutemen by 1969 and procurement of an additional 355 Hound Dog missiles, enough to equip the entire B-52 force. The 1965-1969 cost of the Minuteman program proposed by the Chief of Staff, USAF, would be approximately $10,064 million, as opposed to about $4,757 million for my recommended program. The additional Hound Dog procurement would cost approximately $388.5 million. This proposal was not included in the program submission of the Secretary of the Air Force.

Within the objective of a force of 1,200 Minuteman missiles by end-FY 1969, I am recommending an increase in the force level of only 50 missiles in the FY 1965 Budget, instead of the 200 previously planned, for several reasons. First, there has been some reduction in the Soviet ICBM force projected for the late 1960's. NIE 11-8-62, published 6 July 1962, estimated [300-600] operational ICBM launchers in mid-1967. The range is now estimated to be [335-525]. Second, an FY 1965 increment of 50 missiles should reduce the risks of extensive modification which can arise from difficulties discovered in the Improved Minuteman development cycle and permits a more orderly deployment schedule. Moreover, because of the reliability improvement program, plus a $368 million cost overrun for FY 1963 and FY 1964, and other cost increases, the total obligational authority required in FY 1965 for Minuteman is now increased by $274.8 million over the amount previously approved. Finally, the over-all force effectiveness of the recommended force of 400 basic and 800 Improved Minuteman, is greater than that achievable with the previously approved force level of 800 basic and 500 Improved Minuteman missiles. In terms of target destruction capabilities, the recommended force provides 30-40 per cent greater effectiveness than the previously approved force.

I also recommend that we continue development and procurement of the Post-Attack Command and Control System, which includes 17 KC-135B airborne command posts and 36 B-47 airborne communications relay aircraft. This system permits the maintenance of one SAC command post in the air at all times, plus one on a high state of alert at each of the SAC alternate headquarters. These aircraft can launch and control the SAC force, including launching of the Improved Minuteman in the event that its Launch Control Centers have been destroyed.

Based on advice from the Joint Chiefs of Staff and General Power, I have cancelled plans for the construction of a Deep Underground Headquarters for SAC. While there is a requirement for an increase in the survivable command and control capability for SAC, a re-examination of the operational considerations and associated costs have led me to conclude that this center could not be justified at this time. I recommend that the funding previously approved for FY 1965 through FY 1968, totalling $106 million, be deleted from the program.

The following section describes in greater detail the basis for my recommendations. I shall review first our strategic objectives, the Soviet Bloc nuclear threat, our target destruction capabilities, and general nuclear war outcomes. I shall outline in more detail in Appendix I, pages 24-29 the key decisions to be made this year.

II. General Basis for Force Level Recommendations

General Nuclear War Objectives

The objectives for our Strategic Nuclear Forces can be summarized under three distinct headings. These objectives provide quantitative tests of the adequacy of our posture.

"Assured Destruction" of the Soviet Union

An essential test of the adequacy of our posture is our ability to destroy, after a well planned and executed Soviet surprise attack on our Strategic Nuclear Forces, the Soviet government and military controls, plus a large percentage of their population and economy (e.g. 30% of their population, 50% of their industrial capacity, and 150 of their cities). The purpose of such a capability is to give us a high degree of confidence that, under all foreseeable conditions, we can deter a calculated deliberate Soviet nuclear attack. The calculations made to test this ability are our best estimates of the results of possible Soviet calculations of what we could do to them in retaliation if they were to attack us. This calculation of the effectiveness of the U.S. forces is not a reflection of our acutal targeting doctrine in the event deterrence fails. I will call this objective "Assured Destruction."

"Damage-Limiting" Forces

Beyond the force required to meet the test of "Assured Destruction," additional forces may be justified if they could further reduce the damage to the U.S. in the event of a Soviet attack by an amount sufficient to justify their added costs. Such forces might help to limit the damage to the United States both by destroying some of the Soviet nuclear delivery systems, and by disrupting the coordination of the rest, thereby easing the task for our defensive forces.

A "Full First-Strike Capability"

The most ambitious form of the "Damage-Limiting"objective is a "Full First-Strike Capability" which is defined as a force so large and so effective, in relation to that of the Soviet Union, that we would be able by a first-strike to reduce Soviet retaliatory power to the point at which it could not cause severe damage to U.S. population and industry.

(Contd)

A "Full First-Strike Capability"(Contd)

Of course, any force designed for "Assured Destruction" and "Damage-Limiting" capabilities will inevitably have in it some first-strike capability. But what is at issue is whether our forces should be augmented beyond this in an attempt to achieve a capability to destroy enough of the Soviet nuclear forces in a first-strike that the damage to ourselves and our Allies caused by their retaliation could be considered acceptable on some reasonable definition of the term.

The following analysis reviews alternative U.S. forces in terms of their ability to accomplish these objectives. The conclusions I have reached are as follows:

1. The forces I am recommending are clearly adequate for the objective of "Assured Destruction" under any reasonable definition.

2. The prospects for "Damage Limiting" by counterforce attacks may not hold great promise in the latter part of the 1960's if the Soviets harden and disperse their ICBM force and build up their missile submarine force as we now expect them to do. I believe that the recommended forces accomplish what might reasonably be able to be done from this point of view, and that the extra capability proposed by the Air Force would make a contribution to "damage limiting" too small to be justified in the light of its extra cost.

3. A "Full First-Strike Capability" does not appear to be feasible during the time period under consideration with the weapon systems projected for both sides, unless the Soviets choose to buy strategic forces that are both smaller and less well protected than we now expect. In any case, 200 or 750 extra Minuteman missiles, as proposed by the Secretary and Chief of Staff of the Air Force, respectively, would not significantly improve the outcome of the war for us.

Projected Soviet Strategic Posture

The following table summarizes current estimates of Soviet strategic forces in mid-1967 and 1969. For comparison, estimates for mid-1967 made last year are also given.

SOVIET STRATEGIC RETALIATORY FORCES AND DEFENSIVE FORCES

	Based on NIE of 6 July 1962			Based on NIE of 18 October 1963					
	Mid-1967			Mid-1967			Mid-1969		
	Low	Med	High	Low	Med	High	Low	Med	High
Operational ICBM Launchers a/									
Soft Launchers (2 per site)									
1st & 2d Generation	150	200	250	150	200	250	150	200	250
Very Large ICBM's									
Hard Launchers									
2d Generation (3 per site)									
Follow-on (possibly one per site)									
Tyuratam									
Total (rounded)	300	450	600	325	435	525	400	560	700
Operational IRBM/MRBM Launchers a/									
Soft (4 per point)									
Hard (2 or more/point)									
Total	550	650	650	700	725	750	700	725	750
Missile Submarines b/									
Ballistic									
Nuclear									
Diesel									
Cruise									
Nuclear									
Diesel									
Total Missiles:									
Ballistic	75	84	90	173	194	212	185	212	236
Cruise	144	144	144	144	177	210	168	213	258
Bombers/Tankers									
Heavy									
Bison									
Bear									
Total	105			150	175	190	130	150	175
Medium									
Badger									
Blinder									
Total	750			600	725	800	400	525	650
Total--Bombers/Tankers	855			750	900	990	530	675	825
Defensive Forces									
ABM Defended Areas	N/A	N/A	N/A	2	2	2	2	2	15
SA-2	600	600	600	1100	1100	1100	1100	1100	1100
SA-3	400	600	800	460	460	535	500	500	650

a/ Soft launchers, but not the hard launchers, are believed to have missiles and capacity for refire.

b/ The NIE is noncommittal on the total number of Submarine missiles. Best estimates have used for this table.

TOP SECRET

Projected Soviet Strategic Posture (Contd)

Although projections of Soviet forces in the late 1960's are necessarily subject to uncertainties, development and deployment patterns have made possible the identification of some broad trends.

ICBM's and IRBM's

The Soviets now appear to be deploying ICBM's in both a soft configuration with two launchers per site and a hard configuration with three launchers (silos) per site. One additional missile is probably available to each soft launcher, but not to the hard launchers, for a refire capability. Our own experience suggests their silo hardness would be in the range _.

By 1965, the Soviet IR/MRBM force will probably launchers. Currently a refire capability for soft launchers is available, and this force is deployed in a four launcher per site configuration. The Soviets are also hardening some of their IRBM sites, and while currently believed deployed in a two launcher per site configuration, three launchers per site is possible. There is no evidence to indicate that follow-on systems are being developed. However, a mobile deployment of a new system is possible.

SLBM's

The Soviets have under development a 700 n.mi. submerged-launch ballistic missile for their submarine force. Existing submarine launched ballistic missiles have only a 350 n.mi. range and the submarine must surface to fire. At present, Soviet submarines carry at most three ballistic missiles. Although likely, there is no evidence that the Soviets are building a new class of submarine carrying more missiles. In addition to ballistic missiles, the Soviets also have a large number of submarines (both nuclear and diesel powered) capable of launching cruise missiles. It is believed that the cruise missiles will be deployed in support of anti-shipping warfare; however, the possibility that they could be used against land targets is not ruled out.

SLBM's (Contd)

By mid-1969, the number of submarines carrying ballistic missiles is estimated to vary between 64 and 81, and in the absence of a new class submarine, this force would carry between approximately 185 and 236 missiles.

Long Range Bomber Forces

Although the Air Force believes that the Soviets intend to deploy a new heavy bomber between 1965 and 1967, this view is not shared by other members of the intelligence community. Barring this possibility, there is a projected reduction in both the heavy and medium bomber forces. Evidence indicates that the Bear and Blinder "B" aircraft have available a standoff missile capability. However, the capability for intercontinental attack remains limited, even though the Soviets have given considerable emphasis to arctic staging exercises and to aerial refueling practice in an effort to overcome range deficiencies of their bomber force.

Availability of High Yield Weapons

The Soviet homeland defenses, including civil defense, are discussed in Appendix II, pages 30 to 31.

Strategic Targets In the Soviet Bloc

A projected list of Soviet Bloc targets was derived based on the NIE estimates of the Soviet strategic offensive forces for the mid-1969 period. In addition to cities, the list includes primary military targets which represent a threat to the U.S., Western Europe and overseas theater forces. This projection includes targets which would comprise the Allied Command Europe (ACE) Threat List. The number of these targets which would be attacked by theater forces and would not have to be scheduled for attack by our Strategic Retaliatory Forces is uncertain. The total Sino-Soviet Bloc Target List which is of primary interest to the U.S. is shown on the following page.

SOVIET BLOC TARGETS END-FY 1969

Targets	USSR Low	USSR Med	USSR High	SALT a/	TOTAL Low	TOTAL Med	TOTAL High	Extrapolated ACE Threat List Low	Extrapolated ACE Threat List Med	Extrapolated ACE Threat List High
Urban Industrial										
Strategic Command/Control		50		40		90				
Other Cities		100		25		125				
Sub-Total		150		65		215			0	
Strategic Nuclear										
Bomber Home & Staging Bases	50	50	50	30	80	80	80	55	55	55
Offen.Fighters,Tac.Staging	65	65	65	65	130	130	130	120	120	120
ICBM Sites - Soft	90	122	150	0	90	122	150	0	0	0
ICBM Sites - Hard c/	70	100	295	0	70	100	295	0	0	0
IR/MRBM Sites-Soft	125	125	125	0	125	125	125	115	115	115
IR/MRBM Sites-Hard	100	113	125	0	100	113	125	90	100	110
Submarine Bases	30	30	30	5	35	35	35	15	15	15
Offensive Controls	30	30	30	15	45	45	45	20	20	20
Sub-Total	560	635	870	115	675	750	985	415	425	435
Defensive and Other Military										
Air Defense Fields/Controls		65		50		115			35	
SAM Sites d/		100		40		140			10	
Aircraft Dispersal Bases		65		45		110			100	
Strat/Tac.Wpns Storage		225		15		240			40	
Other Mil/Interdiction		155		65		220			70	
Sub-Total		610		215		825			255	
Total	1320	1395	1630	395	1715	1790	2025	670	680	690

a/ Includes China.

b/ These are included in the preceding total.

c/ Includes Tyuratam missile test range. All hard ICBM's are assumed to be deployed in a three launcher per site configuration except for the high Soviet posture for which case the follow-on ICBM is assumed to be widely dispersed.

d/ This number includes only those SAM's not colocated with other targets and which are in penetration corridors.

Current Coverage of Targets Threatening Western Europe

Today the ACE Threat List consists of approximately targets. SACEUR's major subordinate commanders also maintain a target list of approximately additional preselected targets for possible attack in the event of a nuclear war in Europe. Allied Command-Europe has three programs for attacking them:

1. The SACEUR Scheduled Program, which is directed against the primary nuclear threat to Europe currently involves about targets (of the approximately targets on the ACE Threat List) within range of his forces.

2. The Major Subordinate Commander's Regional Priority Program consisting of approximately other interdiction targets to be attacked by SACEUR forces.

3. The Major Subordinate Commander's Regional Program consisting of approximately preselected fixed targets concerned with the interdiction campaign, the land battle, and naval targets which may require attack.

There are, in addition, other unscheduled targets of opportunity which would be attacked in connection with the land battle.

The extent to which U.S. "external" forces (i.e., U.S. forces not under SACEUR's command) are now scheduled to attack targets on the ACE Threat List is shown below.

ALLIED COMMAND EUROPE CURRENT THREAT LIST

	SACEUR's Scheduled Program a/			
	SACEUR Alone	SACEUR & External	External Alone	Total DGZ's
Strategic Nuclear High Urgency				
Primary Bomber				
Primary Offensive Fighter				
Soft MR/IRBM Sites				
Hard MR/IRBM Sites				
Missile Submarine Bases				
Military Controls				
Defenses and Other Military				
Aircraft Dispersal Bases				
Strategic/Tac Wpns Storage				
Other Mil/Interdiction				
Urban Industrial				
Totals				

a/ The targeting of the assigned UK "V" bomber force will change these results.

Forces Required for "Assured Destruction"

Returning now to the broad strategic objectives mentioned earlier, I would like to address first the forces required for "Assured Destruction." The effectiveness of our posture as a deterrent to deliberate Soviet attack depends on the Soviet calculation of what we can do to them in retaliation if they attack us. Although the Soviets would doubtless consider the prospective military outcome of such an attack, they would have to give great weight in their consideration to the number of people we could kill and the amount of damage we could cause to their industry. Therefore, in considering "Assured Destruction," I shall calculate the destructive capacity of our force on the hypothetical assumption that all of it is targeted on cities, even though in fact we would not use our forces in that manner if deterrence failed. The key decision we now face is the total size of our Minuteman force. Through the FY 1964 Budget, a force of 950 Minuteman missiles has been authorized. In the calculations that follow, I shall assume that all other forces are held constant at the levels shown for FY 1969 in the table on page 2, and then vary the number of Minuteman missiles as we consider alternative objectives.

In 1969, without any Minuteman missiles, we plan to have about 1,900 weapons and 3,850 megatons in the alert portion of our Strategic Retaliatory Forces. Assuming that the Soviet Union, using the "Medium" force, attacks our forces with a well planned and executed surprise attack, and that in all cases our expected (i.e., most likely) estimates of operational factors (listed in Appendix III, pages 38-39) prove to be correct, the U.S. force targeted as hypothesized above could be expected to deliver about 700 weapons and 1,200 megatons on about 335 DGZ's.[a] Recognizing that such estimates are necessarily uncertain, the "most likely" factors imply that such an attack on Soviet cities could be expected to kill approximately 115 million people and to destroy about 57 per cent of the Soviet industrial floor space.[b] On this basis, then, the programmed forces for 1969 appear more than adequate without any Minuteman missiles to meet the test of a capability for "Assured Destruction." And, with the inclusion of the already programmed force of 950 Minuteman missiles, the force could kill about 155 million people.

But these calculations depend on the assumptions made about many uncertain variables. In fact, there are several key uncertainties and possible alternative assumptions considerably less favorable to ourselves than those underlying these estimates. Because of the critical importance of our ability to retaliate against deliberate surprise nuclear attack, I believe that our force requirements for this mission should be tested against pessimistic assumptions as well as against our best estimates. We want both fully adequate insurance against future contingencies and to be able to deter even an "optimistic" Soviet decision-maker.

a/ These Designated Ground Zeros (DGZ's) include 50 USSR military and government control centers in major urban areas, 200 other USSR cities, and 85 defense suppression targets located in corridors on the way to the target cities.

b/ See page 13.

TOP SECRET

Forces Required for "Assured Destruction" (Cont'd)

We recognize that it is not normally sensible to design the defense program entirely on the basis of pessimistic estimates. In fact, it can be just as dangerous to overstate as to understate enemy capabilities, for it can lead to the pricing out of the market of valuable capabilities that would appear very useful under realistic estimates of the threat, and it can lead to the adoption of strategies of desperation. In some cases, the fact that a capability exists under optimistic estimates may be significant. However, deterrence of deliberate nuclear attack is so fundamental to our whole defense posture that I believe we should require that our retaliatory power to beyond any reasonable question.

The major uncertainties affecting the assured retaliation capabilities of our Strategic Nuclear Forces can be grouped under four headings: a/

1. Improved Soviet Defenses,

2. Larger or More Effective Soviet Offensive Forces,

3. Lower U. S. Missile Reliability, and

4. Unanticipated Wartime Degradation in U. S. forces.

The effectiveness of U. S. forces for "Assured Destruction" under each class of uncertainties is discussed in Appendix II, pages 31-33.

The effect of making all pessimistic assumptions, however unlikely such a contingency might be, as opposed to making the assumptions we consider most likely, is shown for several alternative Minuteman forces in the following table. In each case, it is assumed that the rest of our forces as shown in the table of page 2 for FY 1969.

---

a/ The range of optimistic, expected, and pessimistic estimates for U. S. operational factors discussed in this section is tabulated in Appendix III, pages 38-39.

---

b/ (Applicable to Page 12) The Soviet surprise attack on the U. S. to which this is a response would have killed 195 million Americans in the absence of an effective nationwide fallout protection program, 120 million if there were a nationwide fallout protection program, in both cases assuming the Soviets immediately target Cities. If the Soviets do not target cities, U. S. fatalities would, nevertheless, vary between 75 million (nationwide fallout protection program) and 180 million (no nationwide fallout protection program). U. S. fatalities in a nuclear war are discussed in more detail in the section on "Damage Limiting" below.

Forces Required for "Assured Destruction" (Contd)

SOVIET FATALITIES AND INDUSTRIAL DESTRUCTION

Number of Minutemen	Expected Factors: Fatalities Mil.	Expected Factors: Fatalities %	Expected Factors: Ind'l.Cap. Destroyed (Per Cent)	Pessimistic Factors: Fatalities Mil.	Pessimistic Factors: Fatalities %	Pessimistic Factors: Ind'l.Cap. Destroyed (Per Cent)
0	115	50	57	40	17	30
950	158	69	82	66	29	50
1,000	160	70	87	68	30	51
1,200	164	71	89	73	32	53
1,400	165	72	90	75	33	54

Granted there are uncertainties, in my judgment these calculations show that to the extent that the prospect of millions of deaths and a high level of destruction of industry can deter a calculated attack, the force of 950 Minuteman missiles already authorized, in combination with the other planned forces should be clearly adequate for "Assured Destruction," while a larger force would add very little from this point of view. From a Soviet viewpoint, the potential damage that could be inflicted by a United States retaliatory attack is so severe that they, the Soviets, should be deterred from initiating general nuclear war.

Because of the concentration of Communist China's industry, [redacted] Minuteman missiles can destroy about [redacted] per cent of the industrial capacity or alternatively [redacted] Minuteman missiles can destroy about [redacted] per cent. My recommended program is more than sufficient to cover this possible requirement.

"Damage Limiting" Capabilities of Alternative U.S. Forces

In this section are discussed the "damage limiting" potential of alternative Minuteman forces acquired for second-strike counter-military targeting. Of course, in the range of conditions most likely to be faced in 1969, almost all of our ICBMs and all of our bombers, and perhaps some Polaris missiles should be available for counter-military targeting.

The effectiveness of the U.S. second-strike missile attack when applied to the Soviet strategic nuclear targets and to the cities is shown below for three alternative forces. Force I represents the FY 1964 Budget to be in place by end FY 1965. Force II is my recommended program including 1,200 Minuteman by end FY 1969, and Force III is Secretary Zuckert's proposal including 1,400 Minutemen by end FY 1969.[a] All Minuteman/Polaris missiles are programmed to utilize a "missile-away" indicator (which allows the commander to assess whether the missiles completed count-down and were launched). Furthermore, the greater flexibility of Improved Minuteman is used to enhance the performance of the basic Minuteman force by a combination of retro-fitting improved missiles in Wing I through V silos and co-location of Improved Minuteman squadrons with existing Minuteman wings.

a/ The costs of these Minuteman forces are as follows.

	FY 64	FY 65	FY 66	FY 67	FY 68	FY 69	Total FY65-69
	(TOA in Millions of Dollars)						
Prev. Appr. (1300)	2111.8	1340.3	1017.3	719.9	595.9	327.5	4000.9
Force I (950)	2107.6	1206.1	550.3	387.9	437.5	450.0	3031.8
Force II (1200)	2280.1	1616.2	1181.0	1062.9	569.1	327.4	4756.6
Force III (1400)	2230.9	2177.3	1457.2	949.0	669.4	457.4	5710.3

SECOND STRIKE "QUICK KILL" CAPABILITIES-MID 1969

Size of Soviet Force	Target Class	DGZs	% Target Destruction Achieved By Alternative U.S. Forces: Force I (950 mm)	Force II (1200 mm)	Force III (1400 mm)
Low[a]	Ind. Cap.	150[d]	65%	65%	65%
	Strat. Nuclear	675	84	90	92
	Air Defense	65	90	90	90
Medium[b]	Ind. Cap.	150	60	60	60
	Strat. Nuclear	750	72	81	84
	Air Defense	65	0	90	90
High[c]	Ind. Cap.	150	25	25	25
	Strat. Nuclear	985	41	49	54
	Air Defense	65	0	25	40

When targeted against the Low Soviet posture, all alternative U.S. forces are able to achieve high target destruction capabilities. Furthermore, when considering the follow-on manned bomber attack, in addition to achieving approximately 95 percent destruction of the strategic nuclear targets, about 70 percent of all soft defensive and other military targets would be destroyed. For all forces 332 Polaris, 75 Improved Minuteman, 54 Titan II and 72 Atlas F (totalling 533 missiles) were available for assignment against USSR urban-industrial areas. These forces could either be applied immediately against Soviet cities or withheld as a protected reserve for such an attack. These calculations assume that the entire force available for counter-military attacks is utilized.[e]

a/ The results are based on the "Low" Soviet force and "Optimistic" U.S. operational factors. Soviet hard missile sites are assumed 100 psi.

b/ The results are based on the "Medium" Soviet force and "Expected" U.S. operational factors. Soviet hard missile sites are assumed 200 psi.

c/ The results are based on the "High" Soviet force and "Pessimistic" U.S. operational factors. Soviet hard missile sites are assumed 300 psi.

d/ Excludes 65 DGZs in the Satellites.

e/ For a slight degradation in damage expectancies (less than 5 percent) a reserve for other contingencies such as the attack of China would be available. The reserve with Force I numbers about 75 Minuteman; with Force II, about 315 Minuteman; while with Force III, about 515 Minuteman. If the follow-on Soviet ICBM turns out to be deployed in a widely dispersed pattern (an additional 67 DGZs) these could still be targeted by U.S. missiles from the reserve. High target destruction would be achieved under either Force II or Force III, and for both of these forces, the reserve would be reduced by approximately 85 missiles.

When targeted against the Medium Soviet posture, the strategic nuclear target destruction capability varies between 72 percent (Force I) to 84 percent (Force III). However, Force I only achieves a 25 percent damage expectancy against Soviet hard ICBMs, whereas Force II achieves a 55 percent damage expectancy and Force III achieves an 80 percent damage expectancy. Furthermore, insufficient missiles are available with Force I to cover air defense fields. Although the HOUND DOG missiles would be assigned against Soviet surface-to-air missile sites and these fields, the HOUND DOG force might not be sufficient in numbers to assure reasonable penetration of the bomber force. With Force I the follow-on bomber attack would only succeed in destroying about 40 percent of the soft defensive and other military targets and would only increase the damage expectancy against hard missile sites by approximately 25 percent. With Force II and Force III, the follow-on bomber attack would succeed in destroying about 60 percent of the soft defensive and other military targets and would increase the damage expectancy against hard missile sites to approximately 75 percent (Force II) and 90 percent (Force III). All U.S. alternative forces have 533 missiles available for assignment against USSR urban-industrial areas.[a]

When targeted against the High Soviet posture (and assuming pessimistic U.S. operational factors), no one of the U.S. forces achieves satisfactory damage expectancies against Soviet targets. Should this contingency occur, the prospects for counter-military options would not hold great promise.

The fatalities that can be inflicted upon the Soviet Union by the U.S. forces which are allocated to urban-industrial areas in the above cases are 75 million assuming optimistic U.S. operational factors, 50 million assuming expected U.S. operational factors, and 25 million assuming pessimistic U.S. operational factors. To these figures must be added the fatalities from the military attacks. Assuming only weapons assigned against hard targets are ground-burst, at a minimum an additional 25-35 million fallout fatalities (depending on the alternative force) would result, provided that the Soviets have a nation-wide civil defense program. In the absence of a nation-wide civil defense program the fallout fatalities would vary between 70-80 million.

The importance of counter-military target destruction lies in limiting the weight of the Soviet attack and consequently limiting the potential fatalities that could be inflicted by the Soviet's surviving forces. The effectiveness of the alternative U.S. forces in limiting damage under second-strike conditions depends on three key sets of assumptions: first, the circumstances of the outbreak of the war; second, Soviet targeting doctrine; and third, our civil defense and other protective programs. With respect to outbreak of the war, there are two significant sets of cases: first,

---

a/ Should the follow-on Soviet ICBM be widely dispersed, both Force II and Force III would have available sufficient missiles to assign one missile against each Soviet hard missile site.

those in which the Soviet forces targeted against our cities are launched before our missiles arrive on target; and second, those in which our missiles have time to inflict attrition on the land-based portion of the Soviet forces assigned U.S. urban-industrial targets.

Little is known about the Soviet targeting doctrine. The Soviets would probably plan on attacking both military targets and cities. But it is possible that we might be able to deter them from attacking cities or that the war could be terminated before massive city attacks are executed. In the table on the following page, cases are considered in which the Soviet attack against our cities are either executed immediately, delayed, or withheld. With respect to the extent of U.S. active and passive defense, if we have fallout protection and effective defenses, counter-military forces can make the job of our defenses easier and reduce directly the number of weapons falling on the United States. Alternative U.S. counter-military forces are compared under alternative sets of assumptions representing combinations of the above conditions. A case is also shown in which no U.S. forces are assigned Soviet Bloc military targets. This case will be designated Force A.

These calculations suggest that the damage-limiting potential of counter-military forces is subject to diminishing returns. In the absence of a nation-wide fallout protection program the U.S. fatalities are great even if urban-industrial areas are not directly involved. For all cases considered, the advantage (as measured in the reduction in fatalities) of second-strike counter-military attacks when compared with attacks which do not target military bases is clearly shown. However, the return associated with the 200 extra missiles proposed by the Secretary of the Air Force is small.

A "Full First-Strike" Capability

Beyond these "Damage-Limiting" objectives, the next threshold is a "Full First Strike" posture, that is, a force that would enable us with a surprise attack to reduce Soviet retaliatory power to the point at which it could not cause severe damage to U.S. population and industry.

It was shown earlier in this memorandum that we can achieve a position of "Assured Destruction", which is another way of saying that we can, with high confidence, deny to the Soviets a "Full First-Strike" capability. But the same means we are using to achieve a posture of "Assured Destruction" are also available to the Soviets. In particular, as indicated earlier, we expect the Soviets to have, at a minimum, between 185 and 236 ballistic missiles on submarines in 1969. There is also a possibility that a portion of their cruise-missile submarine force could be assigned targets in the U.S. Although we can have an effective capability to sink enemy attack submarines in a protracted war of attrition at sea, we do not appear to have any realistic prospect of

U.S. FATALITIES ASSUMING THE SOVIETS INITIATE THE ATTACK

	Alternative U.S. Forces			
	Force A	Force I	Force II	Force III
	(Fatalities in Millions)			
Low Soviet Forces				
A. Minimum Fallout Protection in U.S.[a]				
1. U.S. cities hit immed.	165	138	138	138
2. U.S. cities attack delayed[c]	165	100	83	80
3. U.S. cities attack withheld	N/A	67	53	51
B. Augmented Fallout Protection in U.S.[b]				
1. U.S. cities hit immed.	95	88	88	88
2. U.S. cities attack delayed[c]	95	66	55	52
3. U.S. cities attack withheld	N/A	25	17	16
Medium Soviet Forces				
A. Minimum Fallout Protection in U.S.[a]				
1. U.S. cities hit immed.	195	183	183	183
2. U.S. cities attack delayed[c]	195	162	150	145
3. U.S. cities attack withheld	N/A	145	130	127
B. Augmented Fallout Protection in U.S.[b]				
1. U.S. cities hit immed.	120	110	110	110
2. U.S. cities attack delayed[c]	120	92	85	79
3. U.S. cities attack withheld	N/A	48	43	40

Force A: Forces only targeted against urban-industrial areas.

Force I: Includes 950 Minuteman, and achieves the target destruction capabilities against Soviet Bloc military targets as previously shown.

Force II: Includes 1200 Minuteman, and achieves the target destruction capabilities as previously shown.

Force III: Includes 1400 Minuteman, and achieves the target destruction capabilities previously shown.

a/ Fifty million stocked shelter spaces, but because of limited training for the population, no effective use of these spaces is made.

b/ The "Augmented" protection program assumed here for the U.S. is a nation-wide fallout protection at a cost of $4 billion and consists of 240 million fallout shelter spaces.

c/ The delay is assumed to be roughly 1 to 8 hours, long enough for our missile attack but not our bomber attack to arrive.

being able to destroy a major part of the Soviet deployed submarine missile force in a sudden attack. Moreover, as indicated above, the Soviets are hardening their land-based missiles. The Soviets also have the further option of protecting these forces with anti-ballistic missile active defenses, a choice which as of now appears uneconomic to us, but which may be attractive to them. Furthermore, it is highly doubtful that we would be able to achieve tactical surprise in the kinds of crisis circumstances in which a "First-Strike" capability would be relevant.

In view of these facts, if we were able to achieve a "Full First-Strike" capability, it would have to be because of some special circumstances making for a major asymmetry in our situations. Three possibilities come to mind. First, the Soviets might choose to deploy a small poorly protected force, thereby leaving themselves vulnerable to a U.S. first-strike. Second, one might argue that we could hope to achieve a satisfactory outcome by combining a good first strike capability with a coercive strategy. Or third, we might be able to outspend the Soviets. What are the prospects for each?

As for the first possibility, admittedly the Soviets are now substantially behind us in the size and protection of strategic forces. However, it seems most improbable, in the face of a U.S. attempt to achieve a "Full First-Strike" capability, that the Soviets would not continue to build missile submarines and to harden or otherwise protect their missiles. As the calculations below will show, under circumstances very favorable to the achievement of a Full First-Strike capability, the extra contribution of more Minutemen, above the recommended force, would be small.

Second, by the coercive strategy is meant an attempt to knock out most of the Soviet strategic nuclear forces, while keeping Russian cities intact, and then coercing the Soviets into avoiding attacks on our cities (by the threat of controlled reprisal) and accepting peace terms. In this case, we would be counting on destroying their <u>will</u> and not their <u>ability</u> to destroy our cities. I believe that the coercive strategy is a sensible and desirable option to have in [illegible] circumstances in which we are trying to make the best of a bad situation. There the only justification it requires is a reasonable possibility that it might work. But it would be foolish to count on it working to the point that it would form the basis for a belief that we could strike first without retaliation. Nor does this possibility provide a basis for buying more missiles.

The third possibility is that we might achieve a "Full First-Strike" capability by outspending the Soviets. The key to this problem--and indeed, the key to the infeasibility of achieving such a posture--is diminishing marginal returns.

The following table compares four alternative U.S. forces. Force I is a force posture including 950 Minutemen. Force II is the recommended force and includes 1,200 Minutemen. Force III is the proposal of Secretary Zuckert and includes 1,400 Minutemen. Force IV includes the 1,950 Minutemen proposed by the Chief of Staff, Air Force.

US/WESTERN EUROPE FATALITIES UNDER U.S. INITIATION
And Soviet Counter-City Retaliation[a]
(In Millions)

	U.S. Fatalities				Western Europe Fatalities			
	I (950MM)	II (1200MM)	III (1400MM)	IV (1950MM)	I (950MM)	II (1200MM)	III (1400MM)	IV (1950MM)
Low Soviet Posture[b]	50	40	32	28	90	75	65	60
Medium Soviet Posture[c]	95	75	65	58	100	90	85	75
High Soviet Posture[d]	162	153	148	138	155	142	138	130

Only if the Soviets elect a minimum force posture would there be prospects of keeping U.S. fatalities at a relatively low level. But in this case, greater numbers of Minutemen beyond the level recommended do not substantially reduce U.S. fatalities. Moreover, the potential damage to Western Europe remains very high. For the two other Soviet postures U.S. and NATO fatalities are high, and additional Minutemen do not hold great promise in reducing these fatalities. For the Medium Soviet posture, even if we were to augment Force IV with the NIKE-X anti-missile system at a cost of $20 billion (assuming the system could be deployed around 23 cities by mid 1969) U.S. fatalities would, nevertheless number about 35 million provided the U.S. has a nation-wide civil defense program. However, in the absence of a civil defense program and assuming the High Soviet Posture U.S. fatalities would number about 120 million.

a/ All surviving Soviet forces, except their bomber force, are assumed targeted against cities. If only military targets are attacked, U.S. fatalities would be under 20 million providing that the U.S. has a nation-wide civil defense program. In the absence of a civil defense program U.S. fatalities could number between 70-90 million. Under first-strike circumstances U.S. reserve forces greatly outnumber those of the Soviet Union.

b/ The results are based on the "low" Soviet force, Optimistic U.S. operational factors and nation-wide Civil Defense program.

c/ The results are based on the "medium" Soviet force, Expected U.S. operational factors and nation-wide Civil Defense program.

d/ The results are based on the "high" Soviet force, Pessimistic U.S. operational factors and no nation-wide Civil Defense program.

It would seem almost unbelievable that the Soviets would not react if we started building Force IV augmented by NIKE-X. What would be the prospects in such an arms race? Studies suggest that, assuming Soviet costs are similar to ours and that they disperse their hard ICBM's two to a point, and assuming that we wish to assure the survival of 80 percent of our population (i.e., no more than 40 million dead) after a U.S. first-strike, the cost exchange rate is roughly three to one against us. That is, if we attempt to maintain a first-strike posture defined as no more than 40 million dead (and the Soviets attempt to achieve a capability to kill at least 40 million Americans in retaliation) we must outspend them, at the margin, by three to one. And if we set our sights higher than 80 percent, the cost exchange rate becomes even more unfavorable.

What this and other analyses suggest quite clearly about the "Full First-Strike" objective is: first, that if we were to want to make the attempt to achieve such a capability, the most productive increments with respect to our current program would certainly be in civil defense and possibly in anti-missile defenses, not more ICBM's; and second, that the attempt to achieve a "Full First-Strike" capability, under any reasonable definition of the term is, to the extent that anything is predictable in defense planning, bound to be defeated by diminishing marginal returns.

Other Reasons for Counter-Military Forces

There are other reasons for having strategic forces available for targetin against Soviet military forces. The list includes a capability for limited strategic nuclear attacks, forcing the Soviets to devote resources to protectin their forces, and placing significant constraints on the Soviet attack planners These considerations are discussed in greater detail in Appendix II pages 33-35

Conclusions

The advice of the Joint Chiefs of Staff, the various calculations and studies I have reviewed over the past year, and the analysis described in this memorandum have led me to the following conclusions:

1. The forces I am recommending are clearly adequate for the objective of "Assured Destruction" under any reasonable definition.

2. The prospects for "Damage Limiting" by counterforce attacks may not hold great promise in the latter part of the 1960's if the Soviets harden and disperse their ICBM force and build up their missile submarine force as we now expect them to do. I believe that the recommended forces accomplish what might reasonably be able to be done from this point of view, and that the extra capability proposed by the Air Force would make a contribution to "damage limiting" too small to be justified in the light of its extra cost.

3. A "Full First-Strike Capability" does not appear to be feasible during the time period under consideration with the weapon systems projected for both sides, unless the Soviets choose to buy strategic forces that are both smaller and less well protected than we now expect. In any case, 200 or 750 extra Minuteman missiles, as proposed by the Secretary and Chief of Staff of the Air Force, respectively, would not significantly improve the outcome of the war for us.

APPENDIX I: BASIS FOR RECOMMENDATIONS ON PARTICULAR WEAPON SYSTEMS

Within the general quantitative requirements for long-range nuclear delivery systems discussed above, the following are the reasons for my specific program recommendations.

Atlas D, E, and Titan I

The Air Force has proposed the phase-out of 27 Atlas D missiles by end-FY 1965; 27 Atlas E missiles by end-FY 1967; and the 54 Titan I missiles by end-FY 1968, and the substitution of an extra 100 Minuteman missiles for them. I recommend that the Atlas D and E and Titan I phase-out be implemented with estimated savings of $209 million.

The Atlas D is configured in a soft, three missile complex and has a slow reaction time. The first missile cannot be launched until fifteen minutes after an execution order; the second missile not before eight minutes later; and the third missile after still eight minutes later. The Atlas E, configured one missile per site, is hardened only to psi and has a reaction time of fifteen minutes. The Titan I is configured three missiles per complex. Theoretically, it is hardened to between psi, but the great complexity of the system makes its actual survival potential very uncertain and most probably lower. Moreover, the reaction time of Titan I is also slow -- the first missile fifteen minutes after an execution order; the second missile eleven minutes later; and the third missile eleven minutes later, a full 37 minutes after the order to fire is given.

Since large quantities of Minuteman missiles will be in the inventory, it seems appropriate to phase-out these systems to realize savings in costs that can be applied to more effective systems. Furthermore, no additional funds will be programmed for operational improvements on those first generation missiles which are scheduled to be phased out.

Defense Suppression Missiles

The Chief of Staff of the Air Force recommended a procurement of 355 missiles at an estimated cost of about $388 million. The force I am recommending does not include a new procurement of Hound Dog missiles, but reflects maximum retention of the missiles already procured. I believe that the number of Hound Dogs that will be available for the alert bomber force is sufficient in conjunction with our other strategic systems adequately to perform the defense suppression mission.

ICBM Reliability Program

As I have mentioned, the Joint Chiefs of Staff, the Services and I have been very concerned about the current system reliability of our Atlas, Titan, Minuteman, and Polaris forces. The Air Force has proposed an accelerated reliability improvement program consistent with the Joint Chiefs of Staff guidance for Atlas F, Titan II, Minuteman, and Improved Minuteman. (Contd)

ICBM Reliability Program (Contd)

The reliability program for Atlas D, E, and Titan I will be carried out within available resources. For Atlas F and Titan II, it is desired that a demonstrated reliability of 75 per cent be established with 75 per cent confidence. This corresponds to an expected reliability of about 90 per cent. For planning purposes, 12 Atlas F and 12 Titan II, and approximately 10 per cent of the Minuteman force would be expended annually in the operational reliability program. The proposed program should raise the reliability of these systems. Although the total cost of the reliability program cannot be accurately determined at this time, our best estimates now are summarized in the following table.

RELIABILITY TEST PROGRAM COSTS
(Additional TOA in Millions of Dollars)

	FY 65	FY 66	FY 67	FY 68	FY 69	Total FY 65-69
Atlas	3.4	2.9	2.8	2.0	2.0	13.1
Titan	19.5	1.0	.9	8.8	16.0	46.2
Minuteman	92.2	60.2	80.0	124.0	120.8	477.2
Total	115.1	64.1	83.7	134.8	138.8	536.5

Minuteman Program

The previously approved program consisted of 800 basic Minuteman and 150 Improved Minuteman by end-FY 1966. For planning purposes, the force consisted of 800 basic Minuteman and 500 Improved Minuteman by end-FY 1968. The first 800 Minuteman (Wings I through V) included both the "A" (Wing I) and "B" (Wings II-V) configurations. The Minuteman subsequent to Wing V are programmed for the Improved or "F" configuration. The characteristics of the A, B, and F configurations are compared in the following table. The essential difference between A and B is that the latter has a flexibility of two targets per missile; the former has but one target. In addition, the power supply associated with Wings III through Wing V are hardened to psi.

	Minuteman Characteristics	
	A/B	F
Stored targets		
Range (n.mi.)		
Current yield (MT)		
CEP (n.mi.)		
Radio launch overlay		
Post attack survivability		

The advantages of these improvements will be discussed later.

Minuteman Program (Contd)

As a result of the reliability test program, the A/B missiles expended in these firings will be replaced by the "F" missiles allowing, in part, targeting backup flexibility -- "internetting" -- for the first five wings of basic Minuteman through the use of Improved Minuteman.

In the recommended program, the full internetting of the Basic and Improved Minuteman force would be obtained both by retrofit and the co-location of Improved Minuteman squadrons with the five Wings of Basic Minuteman. A significant increase in effectiveness is possible. For example, the target destruction capability of the recommended force, including 1,200 Minuteman missiles, is 30-40 per cent higher than that achievable with the previously approved force including 1,300 Minuteman missiles. The expansion of the recommended Minuteman force level is as follows:

Force Expansion	FY 66	FY 67	FY 68	FY 69
Co-location I-V		50	100	100
Retrofit	50	140	130	80

With the recommended program the co-location of three squadrons (beyond the squadrons in Wing VI) and the retrofitting of basic Minuteman silos for full target flexibility will by end-FY 1968 complete the internetting of Basic and Improved Minuteman. The characteristic of Improved Minuteman which allows targeting backup flexibility is the eight stored target capability, and the ability to select a target rapidly if the initially assigned Minuteman experienced a malfunction during countdown. To transmit this information to the squadrons of Improved Minuteman, I recommend that we install "missile away" recorders at all Minuteman silos at a total cost of $14 million.

With the greater range of Improved Minuteman all targets in the Soviet Union can be attacked; and, in addition, many targets in Northern China can be reached. The greater range with the payload can also be translated into greater payload (about lbs.) at 5,500 n.mi. A larger warhead could consequently be utilized on Improved Minuteman.

The greater accuracy is advantageous for destruction of hard targets, or for accurate delivery of a small weapon against targets we want to destroy without causing great collateral damage.

The Radio Launch Overlay permits the missiles to be launched by the airborne command post in the event all five launch control centers in a squadron are knocked out. The Permissive Action Link will also be installed and is a safeguard against unauthorized or accidental detonation of the warheads. I recommend both be programmed as the basic Minuteman force is retrofitted with Improved Minuteman. The total costs of these flexibility modifications are $60 million and $24.9 million, respectively. Other flexibility modifications, including status authentication, remote targeting and time-over-target systems, will be programmed at a total cost of $135 million.

Minuteman Program (Contd)

Because of unprotected power supply in Wings I and II, approximately six hours endurance is possible if the diesel generators and the environment control system are destroyed in the initial enemy attack. Twenty-six hours of endurance is possible through the use of additional batteries. The Air Force believes that survivability beyond six hours is unnecessary. They feel that by the time this modification is completed (mid-1965), sufficient missiles will be available, and in conjunction with Wings III and beyond, Wing I and II missiles would be assigned against time-sensitive targets. However, the issue is not one of sufficient number of "quick-reacting" missiles. Delays in decision making, transmittal of authenticated orders, et cetera are possible. It would be imprudent to assume that under all circumstances we would be able to respond in a timely fashion. The recommended program includes $3.0 million in FY 1964 and $27.5 million in FY 1965 for extended survivability for Wings I and II. Since the power supply for Wings III to V are hardened to no additional battery supply is contemplated at this time.

The Air Force proposed the siting of a squadron in a location which would allow peacetime launches under the nearest possible operational conditions. A possible location is the Hunter Liggett reservation north of Vandenberg. The cost of this squadron is estimated to be $27 million (all in FY 1965) over the cost of a normal squadron deployed in a Wing. The basis for the proposal is to provide actual operational test of missile, launcher, control system, human factor, and technical data. It also provides a control sample from which to determine bias in test launches, and control system and anomalies introduced by and during shipment of missiles from operational sites to Vandenberg missile range.

The decision to fund such a squadron will be held in abeyance until firings from Vandenberg Air Force Base have been accomplished and analyzed, and determination made that the results are inferior to results that could be expected from firings from an isolated squadron. Further, such a decision should await the firm determination of the technical details to be incorporated in the retrofit program to insure that the squadron would be representative of the operational force to be tested. This decision need not be made until FY 1966.

No additional procurement of B missiles is required after FY 1964. However, in FY 1964 procurement of B missiles has been increased from 171 to 198 to support the reliability program for the A/B missile.

Polaris Retrofit Program

The Navy had previously proposed that all Polaris A-1 and A-2 missiles be retrofitted with the A-3 missile. The A-3 missile has a longer range (2,500 n.mi.)than the A-1 (1,200 n.mi.) or A-2 (1,500 n.mi.) and carries a three element warhead. I recommend that the A-1 retrofit program proceed according to the Navy's proposal. However, I do not believe that it is necessary to retrofit the A-2 missiles with A-3's at least through 1970.

(Contd)

Polaris Retrofit Program (Contd)

Even though the range of the A-3 is greater than the A-2, a large fraction of the Soviet Bloc targets are within range of the Polaris A-2 missile. During 1970 the Polaris force will be commencing the second overhaul cycle. At that time, if conditions warrant it, the A-2 retrofit will be reconsidered. Savings through 1969 resulting from the postponement of the retrofit of A-2 missiles with A-3 missiles amount to $425 million, of which $110 million is realized in FY 1965.

B-52 Modifications

As a result of three accidents involving B-52's, the Air Force undertook a comprehensive investigation of the entire B-52 structural program. They have proposed an additional modification program to correct all known faults and assure the structural integrity of the B-52. Preliminary estimates of the costs of these modifications are as follows:

	FY 64	FY 65	FY 66	FY 67
	($ in Millions)			
Mods	20.0	110.0	102.8	5.3

Although I have not completed my review of alternative courses of action, I have included for planning purposes the requirement for these funds for the FY 1965 to FY 1967 period.

Command and Control

The previously approved program includes an Emergency Rocket Communication System which would provide a survivable means of transmitting the "go" word in case other means of communications were knocked out in an enemy attack. The Air Force proposed to augment this capability by developing and procuring an extended range Emergency Rocket Communication System to serve the southern Airborne Alert route now used by about 60 per cent of SAC bombers. I recommend approval of this proposal. The five year cost of this program would be about $15 million.

The Air Force has also requested $44 million of additional funds for the SAC Control System (465L), of which $11 million would be required in FY 1965. The purpose of this system is to keep CINCSAC fully informed of the status of his forces, and to permit pre-attack control, and replanning. $428.5 million will have been committed to this sytem through FY 1964, and $201.4 million has been approved for FY 1965-69. I am deferring action on the request for additional funds until the program can be reviewed and a determination made of the justification for these proposed cost increases.

Financial Summary of Recommended Strategic Retaliatory Forces

A preliminary financial summary (TOA in millions of dollars) of the Strategic Retaliatory Forces are shown in the following table.

FINANCIAL SUMMARY OF RECOMMENDED STRATEGIC RETALIATORY FORCES
(TOA in Millions)

	FY 62	FY 63	FY 64	FY 65	FY 66	FY 67	FY 68	FY 69
B-52	1285.9	1013.1	877.6	874.9	804.2	684.4	642.3	592.0
E/B-47	397.3	289.9	210.0	131.2	53.0			
B-58	166.6	153.7	108.1	82.7	78.4	75.5	73.4	69.0
Total	1849.8	1456.6	1195.7	1087.9	935.6	759.9	715.7	661.0
Hound Dog	(124.7)	(41.4)	(75.4)	(41.6)	(39.9)	(40.0)	(33.1)	(22.8)
Skybolt	(146.1)	(133.9)						
Atlas	735.2	464.7	251.6	154.1	106.6	81.2	73.8	74.0
Titan	1158.5	866.0	374.9	153.9	113.2	106.5	88.7	83.1
Minuteman	1344.9	2183.6	2280.1	1615.2	1181.0	1063.9	569.1	327.4
Polaris	2278.0	1923.4	1856.1	1041.3	792.2	617.1	567.2	512.6
Total	5516.6	5437.7	4762.7	2964.5	2193.0	1868.7	1298.8	997.1
Other Support	672.0	588.9	523.5	324.8	292.6	272.0	284.0	280.0
Command-Control-Comm/Supp	1072.0	1061.9	1051.1	959.5	928.2	905.0	859.8	820.0
Total	1744.0	1650.8	1574.6	1284.3	1224.8	1177.0	1143.8	1100.0
Grand Total	9110.4	8545.1	7533.0	5336.7	4353.4	3805.6	3185.3	2758.1

APPENDIX II: SOVIET DEFENSIVE POSTURE AND OTHER "ASSURED DESTRUCTION" AND "DAMAGE LIMITING" CONSIDERATIONS

The Soviet defensive posture, including active and passive defense, consists of the following systems.

Ground-to-Air Missile Systems

The present generation Soviet ground-to-air missile, the SA-2, is similar to the U.S. Nike-Ajax. We now estimate the Soviets will have deployed about SA-2 batteries by mid-1967. This estimate is increased from last year's by about . The system has a good capability against bombers at moderate and high altitudes, but its capability below about 3,000 feet is minimal. An improved SA-2 may have an intercept capability against high altitude non-ballistic air-to-surface missiles. Some of the improved SA-2's may be configured for mobile operations.

Although the SA-3 has been estimated to be designed to intercept low-altitude penetrators (including high speed low-altitude ASM's), this capability has not been confirmed. But whether or not the SA-3 has low-altitude capabilities, General Power believes that the Hound Dog will be able to penetrate Soviet defenses at low altitude. We expect roughly SA-3 batteries to be deployed by 1967. There is evidence to suggest that the SA-3 system is a replacement for the SA-2. If this is the case, the total number of SA-2 and SA-3 systems could be overstated.

Interceptors

The current generation Soviet interceptors have airborne intercept radars with track/search ranges smaller than comparable current U.S. fighters. By 1967-69 we consider it within Soviet capabilities to develop a new all-weather fighter assigned to operational units The Soviet fighter system is dependent on ground controlled intercept radars for terminal vectoring to targets. Like our own, the ground direction centers are vulnerable to ballistic missile or air-to-surface missile attack. The effectiveness of Soviet interceptors against air-launched missiles, and to a lesser extent against bombers is expected to be small, not because of terminal performance considerations, but because of the difficulties encountered by interceptors in acquiring targets within a degraded ground environment. The defense potential of Soviet fighters could be enhanced by deployment of an airborne command and direction system, as well as by wide special deployment of a semi-automated command-control system somewhat comparable to our SAGE system. At the present time, there is no indication that such an airborne command system is being developed. An improved semi-automated fighter control system, however, is being introduced.

Anti-Ballistic Missile System

It now appears that the Soviets are deploying an anti-ballistic missile system around Leningrad. This system, if it becomes operational, probably would be effective against ballistic missiles launched from 300-1000 n.mi. but would have only marginal capability against ICBM's. Its effectiveness should deteriorate rapidly with the increasingly sophisticated penetration aids which we plan to use. Some evidence suggests that steps may be underway also to deploy this first generation ABM system around Moscow. The Soviets are also believed to be making a major effort to develop a new ABM system capable of engaging ICBM's.

Soviet Civil Defense Program

Substantial evidence is available indicating that the Soviets have adopted the view that "Civil Defense now must be considered as one of the basic elements in over-all preparation of the country for defense." It is estimated that the annual cost of the current program is between $100 and $250 million compared to our FY 1963 expenditure of $128 million and a FY 1964 programmed expenditure of $300 million. The Soviets are increasing emphasis on utilization of existing structures for shelters. For example, they have added blast doors in the Moscow subways. However, unlike the U.S., there is no evidence of an extensive shelter marking program. The Soviets appear to be relying on compulsory training to familiarize the populace with location of available shelters and protective measures.

Other "Assured Destruction" Excursions

In the memorandum the capability of U.S. forces to inflict high levels of damage on the Soviet Union was calculated on the basis of expected U.S. operational factors. In problems of long range defense planning, we always encounter substantial uncertainties about the factors that influence force requirements. Many of these uncertainties can be described by the range of likely possibilities. For purposes of planning and analysis, it is often useful to describe this range by three estimates: an "optimistic" estimate, an "expected" or most likely estimate, and a "pessimistic" estimate. The pessimistic estimate is the estimate least favorable to ourselves of those which are consistent with the available evidence. For example, we have so far achieved about a 70 per cent success rate in Minuteman ICBM tests. Based on this and our experience with other missile programs, and assuming that we continue reliability testing and development, it is my judgment that a reliability of less than 50 per cent under operational conditions by 1969 is effectively ruled out by the data. And that is our pessimistic estimate. In fact, by 1969 we expect to achieve 75 per cent, and possibly as high as 85 per cent reliability under operational conditions.

Other "Assured Destruction" Excursions (Contd)

The point here is that the relevant test is, "Is it consistent with the available evidence?" and not "Is it conceivable?" A 1969 reliability of 20 per cent, or less, is conceivable. But it is so unlikely that it can be ruled out of the range of practical possibility. This point requires emphasis because there is a mistaken tendency sometimes to test our forces against the most adverse circumstances conceivable.

The major uncertainties affecting the assured retaliation capabilities of our Strategic Nuclear Forces can be grouped under four headings:

1. Improved Soviet Defenses,

2. Larger or More Effective Soviet Offensive Forces,

3. Lower U.S. Missile Reliability, and

4. Unanticipated Wartime Degradation in U.S. Forces.

First, the Soviets may improve the protection of their cities and population beyond what we now expect. Our first calculation of expected damage was based on the assumption that the Soviet populace use whatever fallout protection is now available, but do not have a nation-wide fallout protection program. Moreover, although we expect the Soviets to deploy ABM defenses only at Leningrad and Moscow, they might deploy such a defense at as many as 10 or 15 cities. Such a defense would cost us from $12-15 billion. Assuming a nation-wide fallout protection program and ABM defenses for 15 cities, but not assuming Soviet offensive forces larger or more effective than anticipated, we would be able to destroy about 50 per cent of the Soviet industrial floor space and kill about 60 million people without any Minuteman missiles. With the already programmed 950 Minuteman force, we would be able to kill 90 million people.

Second, the Soviets may prove to have larger and more effective strategic forces than those we now anticipate. The calculation of expected damage shown above was based on the assumption that the Soviets would have the "Medium" force of ICBM's by 1969.
Soviet force is now [redacted] a/ Moreover, there is uncertainty about Soviet missile accuracy and reliability. The foregoing calculations were based on the assumption of [redacted] missile reliability (forces peaked for attack) and a [redacted] ft. CEP as suggested by our intelligence estimates. However, I believe it prudent to insure against a reliability as high as [redacted] and a CEP of as low as [redacted] feet b/

a/ The Air Force dissent speaks of 750-1000 ICBM's under certain conditions. Although this possibility cannot be altogether rules out by the available evidence, if the Soviets were to embark on such a building program, we would find out about it in time to expand our own forces enough to offset it. We therefore do not need to buy insurance against that possibility now.

b/ It is also possible that the Soviets might have multiple guided re-entry vehicles for some of their ICBM's by 1969, although there is no evidence that the Soviets have begun development on such a capability. Our own studies indicate that this would be costly and difficult, and not an efficient way to expend our force. Therefore, I believe we can rule out this possibility for 1969.

Other "Assured Destruction" Excursions (Contd)

Finally, there may be unanticipated wartime degradation in the performance of our forces. There are several possibilities. First, we have assumed that our warning systems work and that we successfully launch the B-52 Alert Force. However, our force will be concentrated on about 40 bases; the Soviets will have missile launching submarines that can attack our bomber bases with very little warning; there are ways in which they can reduce the warning we get from their ICBM's (e.g., long-way around or low angle trajectories); and we may be slow in responding. We should consider the possibility of two-thirds of the Alert Force being caught on the ground, leaving us a force of about 100 B-52's surviving.

Another possibility is that, for one of several reasons, we might be unable to launch our ICBM's before a Soviet follow-up bomber attack. One reason for this might be disruption of our high-level command or communications. Another might be that fear of the effects of gamma radiation on the guidance systems, if we expose the missiles soon after an ICBM attack, would cause us to want to hold the missiles in their silos until the radiation pulse has passed. Therefore, we should consider our retaliatory capability on the assumption that the ICBM's must ride out the Soviet bomber attack. Yet another uncertainty we face is the precise blast resistance of our ICBM silos. We have designed our Minuteman and Titan II silos to withstand . with high confidence. However, there are weapons effects such as the electromagnetic pulse whose lethal radii are uncertain. Therefore, it may be prudent to test our retaliatory power under the assumption that our ICBM silos fail at the equivalent of . For a MT weapon, this would increase the lethal radius from to feet, and the single shot kill probability for a reliable missile with a . CEP from . to . .

The results shown in the memorandum combined all four groups of pessimistic assumptions.

Some other possible reasons for possessing counter-military forces are as follows.

Limited Strategic Nuclear Options

Besides the ones already mentioned, there are other reasons for having strategic forces available for targeting against Soviet military forces. One is to give us the possibility of executing limited strategic attacks. Admittedly our understanding of this range of possibilities is very limited and inadequate at this point in time. But it will doubtless become more important relative to other forms of thermonuclear war as both sides deploy secure well-protected nuclear delivery systems. What I have in mind here are controlled deliberate demonstrations of intent to escalate to strategic nuclear war, to back up ultimata, and to do so in such a way that the war might be able to be controlled and brought to a close.

Limited Strategic Nuclear Options (Contd)

Assume, for example, that a conflict over Berlin, or elsewhere in the NATO area, has expanded into a large scale non-nuclear war and that we are losing Although I do not believe that our loss at the non-nuclear or small-scale tactical nuclear level is as inevitable as commonly supposed, it is clearly a possibility that must be considered. In these circumstances, it may be desirable to have, as an alternative, the possibility of a strike at a group of Soviet bomber bases or staging bases. Such a strike might require on the order of 25 Minutemen. The recommended force clearly provides us enough missiles for such contingencies.

Forcing the Soviets to Harden

Another reason for a counter-military force, one that might argue for having the capability of detonating one reliable warhead over each military target, is that it forces the Soviets either to harden their forces or to accept a position of great vulnerability. Forcing the Soviets to harden, or otherwise protect, their forces from U.S. missile attack has at least two advantages for us. The first is that it forces the Soviets to incur a very heavy cost whence, out of any given budget, they can afford fewer forces.

We do not have detailed studies of the cost of protecting our forces, but there are many indications that it is high. For example, we maintain 50 per cent of our SAC bombers on alert. This means a 1.8 instead of perhaps a 1.2 or even 1-to-1 crew ratio, with proportional increases in flying hours. And the non-alert bombers are not considered survivable under a Soviet missile attack. If we did not have to worry about attacks on our bomber bases, we could plan on getting perhaps 85 per cent of our bombers into the war. Thus, the requirement to protect our bombers approximately doubles the cost of a surviving bomber.

A Polaris submarine, with its missiles, costs roughly $200 million to buy and about $10 million per year to operate. Allowing for a 55 per cent on-station factor, a Polaris missile on-station costs about $28 million over a five year period. If we had no requirement for protecting our forces we could do the same job with soft Minuteman missiles. A hard Minuteman on-alert (assuming 85 per cent on-alert) costs about $7 million over the same period; a soft Minuteman on a lower state of alert would probably cost less than $4 million. In the Minuteman system itself, the cost of hardening exceeds the cost of the silo; it means shock absorbers, hardening power supplies, multiple launch control centers ( ), underground cables with special resistors to stop electromagnetic pulses from nuclear detonations, backup controls to permit launch from airborne command posts, et cetera.

These factors suggest that the program of protection of our Retaliatory Forces from nuclear attack has roughly doubled their cost. If the same factors apply for the Soviets, and we have no reason to suppose the contrary, forcing them to harden would halve the number of weapons they can deploy.

Forcing the Soviets to Harden(Contd)

Moreover, we have found it very difficult to harden our large liquid fueled missiles to the point that we can have high confidence they will survive ground shocks and still operate. This is one of the factors that led us to Minuteman. A Soviet liquid-fueled missile capable of delivering a 100 MT warhead would have a gross weight of approximately 660,000 pounds. This represents a weight twice that of Titan II, and two and on-half that of Atlas F. While this Soviet missile could be hardened, assurance of making the silos withstand high overpressures could be difficult. By forcing them to harden, we may force them to go to smaller missiles with lower payloads.

Finally, forcing the Soviets to harden may be desirable from the point of view of creating a more stable posture, reducing their incentive as well as their ability to make a pre-emptive strike against us. However, in view of the fact that the recommended U.S. force provides us with between a 1.9 and 3.3 numerical superiority in ICBM's alone (vs.), I do not believe that a further increment in our forces is required for this purpose.

Constraints on Soviet Attack Planner

Our possession of a counter-military force puts significant constraints on the Soviet attack planner. In the cost of their bomber operations, the Soviets can get substantially more out of their intercontinental bomber force if they can stage it through peripheral staging bases. But this is a very vulnerable operation. If they have to take seriously the possibility that we might cut off their bomber attack with Minutemen, they must plan a far less vulnerable operation which would deliver fewer bombers to the United States. In the case of their soft ICBM launchers, estimated to have a refire capability, our possession of Minuteman missiles forces the Soviets to discount very heavily all those soft missiles that cannot be launched in about an hour. Therefore, they must have a larger force than otherwise required to meet a given set of counter-military objectives. However, it is clear that the recommended U.S. forces will provide enough missiles for this purpose.

APPENDIX III: STRATEGIC TARGETS IN THE SOVIET BLOC, U.S. FORCE LAYDOWN, AND U.S. OPERATIONAL FACTORS (U)

This appendix lists in a greater detail some of the major assumptions underlying the analysis of the effectiveness of alternative U.S. forces in general nuclear war missions.

Distribution of Population and Industry

The following table compares the distribution of population and industry in the Soviet Union and the U.S. As indicated, the Soviet population is considerable more dispersed than is our own.

CUMULATIVE DISTRIBUTION OF POPULATION AND INDUSTRIAL CAPABILITY:

City & Rank	USSR (Cumulative) Population (Millions)	USSR (Cumulative) Industrial Capacity (Percent)	US (Cumulative) Population (Millions)	US (Cumulative) Industrial Capacity (Percent)
1	6.4	8.2	14.1	11.2
2	9.5	13.1	20.1	17.9
3	10.7	14.7	25.8	22.7
10	17.4	23.9	43.4	36.8
20	24.6	34.0	55.4	47.2
50	37.9	51.0	72.4	57.6
100	49.5	62.8	84.6	68.1
200	61.6	71.0	95.5	78.8

U.S. Force Laydowns

As an example of the allocation of U.S. weapons to targets, the table on the next page (III-2) shows the alternative force laydowns against the medium Soviet Bloc Target Structure.

SOVIET BLOC TARGET STRUCTURE AS OF END FY 1969

Targets	Number of Targets	Weapons Assigned: SSM Force I	SSM Force II	SSM Force III	ASM[a] Force I	ASM[a] Force II	ASM[a] Force III	Gravity Bombs[a] Force I	Gravity Bombs[a] Force II	Gravity Bombs[a] Force III
Urban Industry & Gov't Controls	150	533	533	533						
Satellites	65	0[b]	27[b]	29[b]						
Strategic Nuclear										
Bomber Bases	210	309	309	309						
ICBM Soft	122	179	179	179						
ICBM Hard	100	100	147	294				200	200	200
IR/MRBM-Soft	125	184	184	184						
IR/MRBM-Hard	113	86	166	166				226	226	226
Sub Bases	35	51	51	102				35	35	35
Offensive Control	45	66	66	66						
Defensive and Other Military										
Air Defense Fields	115		96	96	65	65	65			
Unco-located SAM	140				280	280	280			
Aircraft Disp. Bases	110							220	220	220
Strat/Tac Wpns Storage	240							249	249	349
Other Mil/Interdiction	220							220	220	220
Total	1790	1508	1758	1958	345	345	345	1150	1150	1150

These calculations assume that the U.S. alert bomber force has the following loadings.

900 MT gravity bombs

130 MT gravity bombs

120 MT gravity bombs

TOTAL 2560 MT

a/ The air-to-surface missiles and gravity bombs are associated with the alert bomber force only.

b/ These forces could possibly be augmented by missiles in an emergency combat condition, part of the alert bomber force, and the bomber positive control backup force.

TOP SECRET

United States Operational Factors

The table on page III-4 shows the operational factors used in the analysis. The probability of a missile or aircraft delivering its weapon to target is expressed as the product of four factors:

a. Peacetime readiness rate of the alert or on-station force, or RR.

b. Survival rate under enemy attack, or SR.

c. Reliability rate, or R.

d. Penetration rate through enemy defenses, or PR.

For any given Soviet force level, the survival rate of our forces will vary with our force size. The factors shown here were calculated on the basis of the Soviet force projections, with the optimistic factors corresponding to the low Soviet force, the pessimistic corresponding to the high force. The survival rates are calculated under the assumption that the Soviets allocate 200 ICBM's to United States urban-industrial targets.

The ASM's, Atlas, Titan, Minuteman, and Polaris missiles are assumed to carry currently programmed weapons.

Little is known concerning the technical characteristics or potential effectiveness of Soviet anti-missile defenses. For the analysis developed in the memorandum a 15 city Soviet defense was postulated consisting of 3000 interceptors having an unlimited rate-of-fire capability with each interceptor having a kill probability of 80 percent. In order to have a high assurance of penetrating the system 150 reliable missiles were assumed expended. Each of these missiles carried a three element warhead, and, in addition, six effective decoys. The contribution of chaff and ECM was reflected in the effective decoys and affects the "quality" of the defense system. For example, the Polaris A-3 is planned to have this capability.