~~TOP SECRET~~
~~Controlled Dissem~~
~~Limited Distribution~~

NATIONAL INTELLIGENCE ESTIMATE

Soviet Forces for Intercontinental Attack

[ ]

~~TOP SECRET~~
NIE 11-8-71
21 October 1971
~~TS 190558~~

No. 229

~~TOP SECRET~~

THIS ESTIMATE IS SUBMITTED BY THE DIRECTOR OF CENTRAL INTELLIGENCE AND CONCURRED IN BY THE UNITED STATES INTELLIGENCE BOARD.

The following intelligence organizations participated in the preparation of the estimate:

The Central Intelligence Agency and the intelligence organizations of the Departments of State and Defense, the AEC, and the NSA.

Concurring:

The Deputy Director of Central Intelligence

The Director of Intelligence and Research, Department of State

The Director, Defense Intelligence Agency

The Director, National Security Agency

The Assistant General Manager, Atomic Energy Commission

Abstaining:

The Assistant to the Director, Federal Bureau of Investigation, the subject being outside of his jurisdiction.

~~WARNING~~

This material contains information affecting the National Defense of the United States within the meaning of the espionage laws, Title 18, USC, Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited.

~~TOP SECRET~~

NIE 11-8-71, 21 October 1971

[NOTE: Pages through Chapter II of the "Discussion" on page 32 of this NIE were released in early 1995. For convenience we have included a copy of the earlier release with this package. The pages of the previous release are not included in the total page count for this 1997 release.]

NIE 11-8-71

SOVIET FORCES FOR INTERCONTINENTAL ATTACK

CONTENTS

SOVIET FORCES FOR INTERCONTINENTAL ATTACK

THE PROBLEM

To assess the strength and capabilities of Soviet forces for intercontinental attack, to estimate their size and composition through mid-1976, and to forecast general trends thereafter.

SUMMARY AND CONCLUSIONS

I. PRESENT STATUS OF SOVIET INTERCONTINENTAL ATTACK FORCES

General

A. The intercontinental attack forces considered in this paper include intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and heavy bombers. In the course of the past 10 years, the Soviets have engaged in a vigorous and costly buildup of these elements of their military establishment. As a result of this effort, the Soviets had operational on 1 October 1971 an estimated 1,375 launchers at regular ICBM complexes, 440 SLBM launchers, and 195 heavy bombers and tankers. To this may be added (1) 120 SS-11 launchers at Derazhnya and Pervomaysk which, though possibly intended for use against European targets, are nevertheless capable of reaching the US, and (2) 88 ICBM launchers at test or training sites. When all construction now under way on currently operational systems is completed by late 1973, the Soviets will have 1,407 launchers at regular ICBM complexes, including 288 of the large SS-9 type; about

750 SLBMs, including about 650 on Y-class submarines; and 190 heavy bombers and tankers. During the past year, it appeared that the large-scale deployment programs of the 1960s had run their course and that no further deployment of existing ICBMs was planned. Construction of new types of silos which we believe to be underway, however, may indicate a new phase of deployment.

B. We believe that construction of two, possibly three, new types of silos is underway at the test center at Tyuratam and at some complexes in the field. The purpose of the new silos is not clear. They may be intended to house wholly new missiles, variants of present missiles, or existing types in a program aimed at increased survivability. Some may not be intended for missiles at all. We believe that at least one new missile system has been under development for some time and is probably nearing the flight test stage; it may be intended for one of the new types of silos. It would require about two years of testing to reach initial operational capability.

C. Production of the Soviets' 16-tube Y-class ballistic missile submarine has continued apace. We estimate that these submarines are now being built at the rate of about nine per year. There probably are now 23 operational, five or perhaps six in various stages of fitting-out and sea trails, and another 12 on the building ways. Besides the nuclear-powered Y-class, there are missile submarines of earlier design which could contribute to the intercontinental attack mission.

D. The USSR has not, in recent years, shown equal interest in manned bombers of intercontinental capability. No heavy bombers are currently in production, and the design of types now in service—the Bear and Bison—dates from the 1950s. Testing of a new strategic bomber—the Backfire [redacted]—is probably well under way, however, and the first units could be operational by late 1973 if equipped with existing weapons. All but the Air Force believe that this aircraft is best suited for use against Europe and Asia; the Air Force believes that it is suitable for both intercontinental and peripheral operations.

E. The Soviet system of command and control has been considerably improved over the past decade, and it is now flexible, reliable, and highly survivable. It permits Moscow to exercise highly cen-

tralized control over the Soviet forces for intercontinental attack. Soviet writings have considered a number of circumstances under which the order to fire might be given; there is little evidence from these or other sources that the Soviets consider a bolt-from-the-blue first strike a workable strategy, or that they think a US first strike likely. In the event of war, the primary mission of the Soviet strategic attack forces would probably be the classic one of destroying the enemy's war making potential: ICBM launchers and launch control facilities, submarine and bomber bases, command posts, communications and power facilities, and industrial centers.

The Principal Types of Intercontinental Ballistic Missiles

F. The SS-11 Mod 1, by far the most numerous of Soviet ICBMs, is estimated to have a circular error probable (CEP) at intercontinental range of [ ] and a yield [ ]. Thus it is a weapon best suited for use against soft targets—cities, industrial installations, and some military targets. It can reach all parts of the US, but has also been tested to ranges as short as 500-600 n.m., indicating much flexibility in its possible uses. In 1969, testing began on two versions of a modified SS-11 having greater throw weight and increased range. One, the Mod 2A, has a new re-entry vehicle (RV), a warhead probably yielding [ ] and what are probably one or more exoatmospheric penetration aids. The other, the Mod 2B, has three RVs which are not independently targetable. Each RV has a warhead with an estimated yield [ ]. The SS-11 remains a soft target weapon; the two new versions are most likely intended to improve the system's ability to penetrate antiballistic missile defenses.

G. The SS-9 exists in four variants: Mod 1, which carries an RV weighing about 9,500 pounds; Mod 2, whose RV weighs about 13,500 pounds; Mod 3, which has been tested both as a depressed trajectory ICBM (DICBM) and as a fractional orbit bombardment system (FOBS); and Mod 4, which carries three RVs. Leaving Mod 3 aside for the time being, our analysis of evidence on the capabilities of Mods 1, 2, and 4 turns up some perplexing problems.

H. There is general agreement that the SS-9 was developed, early in the 1960s, to provide better accuracy and a larger payload than the SS-7, presumably for use against hard targets—i.e., the US Minuteman system. The Mod 1 appears reasonably well adapted for this purpose. In 1965, however, the Soviets began to test the Mod 2, which, with its heavier payload, was estimated to have a yield [ ] These tests were pursued with great vigor, and the Mod 2 was actually deployed before the Mod 1. [ ] But the Mod 2 has never in its numerous flight tests actually demonstrated enough range to reach any Minuteman complexes. We believe that its demonstrated range could be increased sufficiently to cover all of them by using up more of the available propellant, removing telemetry packages, etc. Yet it remains curious that the Mod 2, alone among ICBMs except the SS-13, has never been tested to what we would presume to be its intended operational range.

I. The kill probability of a missile against hard targets is more sensitive to accuracy than to yield. The accuracy of the SS-9 cannot be ascertained from observations. It must be deduced [ ] In the Intelligence Community, opinions as to the CEP of the SS-9 range from a low of 0.4 n.m. to a high of 0.7 n.m. The significance of these differences is considerable.[1] It is generally agreed that in actual operational employment, accuracies in the force as a whole would be somewhat poorer.

J. In sum, with respect to the capability of the SS-9 Mod 2 against Minuteman, we have estimated that it can have sufficient range to reach all targets even though such range has not been demonstrated in tests.

[1] See paragraphs 32, 33, and 34 for a discussion of the effect of differences in accuracy and yield.

We see no reason to doubt that in the event of general war the Soviets would use it for whatever it could accomplish against the Minuteman system. But, the Soviets would have to deploy several times the present number of SS-9 Mod 1s and Mod 2s, with their present capabilities, before achieving a force which would pose a serious threat to the Minuteman force as a whole. This brings us to a consideration of the Mod 4.

K. In August 1968, the Soviets began testing the SS-9 Mod 4, carrying three RVs. By April 1970, they had conducted 17 tests, about the usual number for a missile before it goes into operational deployment. In these tests, the three RVs [ ] were not independently targetable, and the weapon as tested was not a multiple independently targetable re-entry vehicle (MIRV). [ ] there was no evidence that the Mod 4 had been operationally deployed.

L. In October 1970, tests resumed, and by 5 November there had been four more. One of these was like the earlier tests; one was a failure. The two others exhibited [ ] This led us to point out in NIE 11-8-70, "Soviet Forces for Intercontinental Attack", dated 24 November 1970, TOP SECRET, RESTRICTED DATA, that a system of the type implied by preliminary analysis of these tests could have the capability of attacking independently three separate targets, [ ] In-depth analysis of the four latest tests has cast doubt on the preliminary judgment of last year that the Soviets appeared to be testing a MIRV. There are now divided views: some agencies believe that the Mod 4 is and will remain a soft target multiple re-entry vehicle (MRV); others believe that it could be either an MRV or an MIRV with limited targeting flexibility; still others think that it was intended to be an MIRV, but that development may have been discontinued.[2] No further tests of the Mod 4 have taken place since last fall.

[2] See paragraph 52 for a detailed presentation of the positions of the various agencies.

[ ] there are indications that the Mod 4 is being deployed [ ] All are agreed that if this is so, what is now being deployed is an MRV.

M. Returning now to the SS-9 Mod 3, as observed above it has been tested both as a DICBM and as a FOBS. In neither form does it have sufficient accuracy to attack hard targets effectively; its apparent function would be to attack soft strategic targets, avoiding early detection by the US Ballistic Missile Early Warning System. (New US warning systems give promise of reducing or eliminating this advantage.) The Mod 3 appears to have limited capability as a FOBS. It is agreed that it has been deployed only to a very limited extent, and that its future deployment, if any, will also be limited.

II. SOVIET POLICY AND FUTURE PROGRAMS

N. The broader reasons for the USSR's energetic buildup of intercontinental attack forces are neither complex nor obscure. In the early 1960s the Soviet leaders, politically and ideologically hostile to the US, and thinking and behaving as rulers of a great power, perceived that in this particular respect their military forces were conspicuously inferior to those of their most dangerous rival, the US. Consequently, they set themselves to rectify the imbalance—to achieve at a minimum a relation of rough parity. Parity in this sense cannot be objectively measured; it is essentially a state of mind. Such evidence as we have, much of it from the Strategic Arms Limitation Talks (SALT), indicates that the Soviet leaders think that they have now generally achieved this position, or are about to achieve it.

O. Many aspects of the present force structure are also susceptible to simple and probably correct explanation. The Soviets built a large number of ICBMs in order to match—and now to surpass—the number of US ICBMs, and also to increase the probability that many would survive an initial US attack. They built missile-launching submarines which are highly survivable when deployed, and they retained a manned bomber force as yet another option. The intercontinental attack force is obviously capable of being used in war, but there is no reason to believe that the Soviet leaders intend deliberately to make nuclear war. The force is an attribute of power, an instrument to support policy, a deterrent to the US.

P. Certain features of the Soviet system have affected the way in which decisions are made, and by whom. In the case of military policy and programs, decision-making is probably centered on two key elements—the military and military-industrial authorities who formulate new programs, and the top political leaders. The latter have the final say, but they must operate in a context of other forces and take them into account. Decision-making appears to involve clusters of advisory and executive bodies which are likely, at times, to be in competition with one another. Bureaucratic pressures, conflicts, and constraints may be heavy on occasion. We think it unlikely that observed Soviet programs are the product of a carefully thought out strategy or rationale which is undeviatingly executed. It is probably fair to say that the system is characterized by conservatism, both in making new proposals and in disposing of them.

Q. Looking to the future, we have little basis in evidence for estimating the content of specific decisions on strategic policy or particular weapon programs. It seems clear that the Soviet leaders intend to maintain at a minimum such forces as will continue to give them—in their own phrase—a sense of "equal security" with the US. One method of doing so might be through an arms limitation agreement; they appear seriously interested in this possibility. We do not know whether an agreement will be reached, or on what terms. If it were indeed concluded, the development of Soviet intercontinental attack forces would be subject to its terms. While we have given consideration in this Estimate to possible effects of a SALT agreement, we confine ourselves mainly to a consideration of the situation in the absence of agreement.

R. With the general attitudes and policies of the USSR being what they are, it might seem obvious to infer that the Soviet leaders will strive to achieve marked superiority over the US in strategic weaponry. We do not doubt that they would like to attain such a position. The question is whether they consider it a feasible objective—whether they believe the chances of success good enough to justify allocation of the necessary resources, adjustment to the political implications of an all-out arms race, and acceptance of the risk that instead of surpassing the US they might fall behind, especially in the technological competition. They might, in any case, think it feasible to seek a strategic posture that, while falling short of marked superiority, makes clear that the Soviets have advantages over the US in certain specific areas. For

example, they can now claim an advantage in numbers of ICBM launchers. Whether or not such advantages are significant militarily, they help to dramatize the strategic power of the Soviet Union.

S. But even if Soviet intentions go no further than maintenance of "equal security", their arms programs are bound to be vigorous and demanding. This is in part because Soviet leaders must have an eye not to what forces the US has at present, but to what it can have, or may have, in future years. In this respect, they are likely to be cautious—to overestimate rather than underestimate the US threat. Moreover, the weapons competition nowadays is largely a technological race; the USSR is impelled to press forward its research and development lest it be left behind. Soviet weapon programs also tend to attain a momentum of their own; the immense apparatus of organizations, installations, personnel, vested interests, and so on, tends to proceed in its endeavors unless checked by some decisive political authority.

T. On the other hand, there are constraints upon Soviet arms programs. The most obvious is economic; resources are not unbounded; the civilian economy demands its share; one weapon system competes with another for allocations; and intercontinental attack forces compete with strategic defense and general purpose forces. The various bureaucracies with interests in one or another area compete partly with rational argument and partly in sheer political infighting. Soviet leaders must also consider how far they may wish to press their own programs lest they provoke countervailing programs in the US. And they must assess not only the present and future US threat, but also that from China, and elsewhere.

U. While the foregoing considerations probably govern the nature of Soviet decisions as to future weapon programs, they provide us with little or no basis on which to estimate in detail what these programs will be. We have never had solid evidence on the problem, and there is no reason to expect that we shall have such evidence in the future. Moreover, in the present era the rapidity of technological advance tends to produce especially vigorous action and reaction between military programs of the USSR and the US.

V. Yet the possibilities are not unlimited, certainly in the next five years or so. For one thing, intercontinental weapon systems are of such

complexity that their development, testing, and deployment take a long time. We can observe the testing phase, and thus project potential deployments. It usually takes about two years from the time we observe the first flight test of a new ICBM until that system becomes operational in the field. The interval for SLBMs is about the same or longer, and for bombers it is much longer. We can therefore estimate with much confidence that the kinds of weapon systems deployed by the Soviets during the next two years or so will be those already in operation or in the late stages of development. Even in the period from two to five years from now the force will be composed largely of existing kinds of delivery vehicles, but it could change substantially by the end of the period of this Estimate.

W. Because of the lead times involved in construction and deployment, we can also be highly confident of the number of launchers of intercontinental weapons which will be operational for periods up to about two years from now. Thereafter uncertainty increases as the time period of projection increases. Some reasonable limits to this uncertainty can nevertheless be derived from our knowledge of past deployment rates, especially those obtaining at a time when the Soviets appeared to be making a particularly vigorous effort.

X. The most significant developments in Soviet forces for intercontinental attack during the next several years will probably lie in qualitative improvements to the ICBM force. The most important of these are likely to be in accuracy of missiles, in MIRVs for them, and in survivability.

1. *Accuracy.* There is still no direct evidence that the Soviets are taking the steps that would be required for them to improve significantly the accuracy of their ICBMs. Improvements sufficient to give system CEPs of about 0.25 n.m. could come about through normal advances in present technology, but an improvement to say 0.15 n.m. would require the Soviets to go to wholly new techniques of guidance. Whether they decide to do this will depend on their future targeting requirements and particularly on how much stress they place on improving capabilities to attack land-based ICBMs.

2. *Multiple Independently Targetable Re-entry Vehicles.* We continue to believe that the Soviets will develop MIRVs for their ICBMs. We expect a flight test program to start soon involving a new missile with MIRVs and with better hard target capabilities

than the SS-9. About two years of testing would be required for this missile to achieve an initial operational capability. The Soviets probably could develop MIRVs based on the technology of the SS-9 Mod 4 with only one year of flight testing, but such MIRVs could not, in so short a time, be made more accurate than the present SS-9—that would require an improved guidance system and about two years of flight testing. Although there are differences of opinion on the future of the SS-9 Mod 4, all agree that it is unlikely to be developed as a hard target weapon if a new missile with hard target MIRVs is in fact to become available in the next two years or so.

3. *Survivability.* The USSR's concern about the survivability of its ICBM force is likely to increase, as the US deploys increasingly large numbers of independently targetable RVs. In addition to the employment of active defenses, survivability can be achieved through hardness and mobility. The new silos which are believed to be under construction will probably be harder than existing types. The Soviets may also pursue development of land-mobile ICBMs, but we believe this less likely than we did a year ago.

Y. With respect to ballistic missile submarines, the Soviets already have about 40 Y-class units in service or under construction, and may continue this program for some time. By the end of 1973 the Soviets will have as many launchers on Polaris-type submarines as the US, and these launchers will constitute a substantial portion of their forces for intercontinental attack. A new missile, the 3,000 n.m. range SS-NX-8, has been undergoing flight testing since June of 1969. Although this missile would be a substantial improvement over the 1,300 n.m. SS-N-6 now carried by the Y-class, the SS-NX-8 appears too large to be carried by Y-class submarines as they are currently configured, and we have yet to identify a new submarine class which might be designed to carry this missile. If the Soviets do in fact deploy a new submarine for the SS-NX-8, the first units probably could not reach operational status until about 1975, by which time the Soviets could have SLBMs equipped with penetration aids or multiple warheads, possibly including MIRVs. As an alternative to a new class of submarines, the Soviets might develop a new missile of extended range (at least 2,000 n.m.) for the present Y-class. If so, the first retrofitted Y-class unit probably could not be operational before late 1974, even if testing of a new missile began soon.

Z. The present fleet of intercontinental manned bombers will probably remain about the same size or diminish only slightly up to the mid-1970's. In time, however, increasing numbers of aircraft in the current inventory are likely to be phased out. We believe that the Backfire is best suited for peripheral operations, but that it may have some capability for intercontinental attack. If so, it could be used to replace or augment existing elements of the intercontinental bomber force, provided a suitable tanker force were also developed. All but the Air Force, however, believe that our knowledge of this aircraft is still too limited to justify a confident judgment of its capabilities and future employment. The Air Force believes that the capabilities of the Backfire indicate a Soviet intent to employ the aircraft in both intercontinental and peripheral operations.

* * * * * * *

AA. The various uncertainties summarized above make it evident that no exact estimate of the future Soviet force structure could be defended. We have therefore constructed, in Section X of this Estimate, several illustrative models to depict various possibilities. The first two, called SALT 1 and SALT 2, represent postures the Soviets might develop under the terms of a postulated SALT agreement. SALT 1 assumes that the primary Soviet objective would be the maintenance of a strong retaliatory capability. SALT 2 illustrates a maximum Soviet effort within the constraints of the postulated agreement and is designed to improve counterforce as well as retaliatory capabilities. We have constructed several other illustrative force models which consider possible Soviet courses without an arms limitation agreement. The first of these, Force 1, is illustrative of the results of a Soviet decision to stay with what they have plus the minimum improvement necessary to maintain what they might consider an adequate deterrent. It seems highly unlikely that the Soviets would be satisfied with such a force. Another model, Force 4, is a sample of what we believe would be a maximum effort short of converting to a wartime basis; this also appears highly unlikely. Force 3, without going as far as Force 4, represents something the Soviets might undertake if they were to place top priority on the early acquisition of a capability to knock out virtually all of the US ICBM force; we also think this unlikely.

BB. Between these outer limits of reasonable force structures we have set forth three others, designated respectively 2A, 2B, and 2C. These differ primarily in the rapidity with which the Soviets, either for technological or other reasons, deploy MIRVs, and in the extent of deployment of new silos. They also reflect some differences in general force structure which would seem likely to obtain because of differences in MIRV development. Our estimate is that Soviet intercontinental attack forces are likely to fall somewhere in the area depicted by the "2" series of force models, but we wish to emphasize that these and the other models are strictly illustrative, and not to be regarded as confident estimates or as projections for planning. As one moves beyond the next two years or so, all projections become increasingly uncertain; beyond five years they are highly speculative.

DISCUSSION

I. DEPLOYMENT OF INTERCONTINENTAL BALLISTIC MISSILES

1. In the aftermath of the Cuban missile crisis, Soviet leaders initiated a broadly based, high priority program designed to bring the USSR out of the position of strategic inferiority which had prevailed since the end of World War II. In the field of intercontinental ballistic missiles (ICBMs), this effort included the development of several new systems and the deployment of three of these—the SS-9, SS-11, and SS-13. By mid-1969, deployment of these systems, combined with that for the older SS-7 and SS-8 systems, had brought the Soviets to a position of equality with the US in the number of operational ICBM launchers—and they have since pulled ahead.

2. It has become apparent during the past year that the large-scale ICBM deployment effort which began with the initiation of the SS-9 and SS-11 programs in early 1964 has run its course and that no further deployment of existing missile systems, or at least of their silos, is currently planned. No new groups of SS-11 silos are believed to have been started since 1969. Although limited SS-9 and SS-13 deployment continued into 1970, five of the last six groups of these systems to be started were probably abandoned later that year. At about the same time, however, construction of new types of ICBM silos is believed to have begun at several complexes. The discussion which follows provides details on the current status of ICBM deployment, including the apparent termination of the major deployment programs of the 1960s and the initiation of deployment of the new types of silos.

Status of Operational Systems

3. As of 1 October 1971, the Soviets had an estimated 1,375 ICBM launchers in service at the regular[3] ICBM complexes, 276 for the

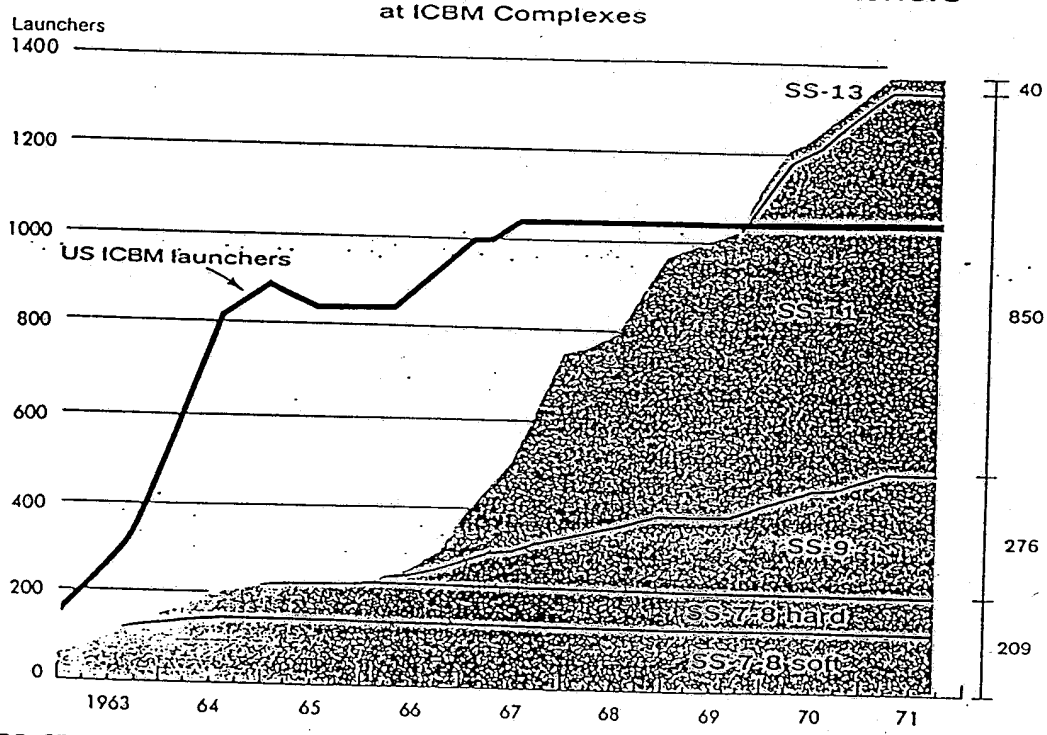
[3] That is, the complexes at which only ICBMs are deployed. In this context, the Derazhnya and Pervomaysk missile complexes, where the SS-11 is deployed along with a small number of medium-range ballistic missiles (MRBMs) and intermediate-range ballistic missiles (IRBMs), are not considered regular ICBM complexes.

large SS-9 missile, 850 for the smaller SS-11, 40 for the solid-propellant SS-13, and 209 for the older and more vulnerable SS-7 and SS-8 systems. (See Figure 1.) These five missile systems are deployed at a total of 24 regular ICBM complexes: six for the SS-9, ten for the SS-11 (nine of these complexes also have SS-7s and SS-8s), one for the SS-13 (which also has SS-7s), and seven for only the SS-7 and SS-8. The SS-11 also is deployed at two missile complexes in the western USSR which at first had only MRBMs or IRBMs. There are also ICBM launchers at the Tyuratam and Plesetsk test centers. (See Table on page 15.)

4. Construction on the last SS-7 and SS-8 launchers ended in mid-1965. All standard SS-11 silos are now complete and only two groups of standard SS-9 silos and two SS-13 groups are believed to be still under construction. All four of these groups probably will be operational by mid-1972, giving the Soviets a total of 1,407 operational launchers at the regular ICBM complexes, assuming no phase out of older launchers. No additional deployment of these ICBM systems in standard types of silos is believed to be planned.

Figure 1

Estimated Soviet Operational ICBM Launchers
at ICBM Complexes



~~TOP SECRET~~

This chart reflects estimates of operational ICBM launchers as of 1 October 1971. Assuming no phaseout of the 209 SS-7 and SS-8 launchers in the force, the Soviets will have 1,407 operational launchers at their ICBM complexes when construction now underway on the systems portrayed is completed in early 1972. The 120 SS-11 launchers at Pervomaysk and Derazhnya are excluded.

5. Account must also be taken of the 120 SS-11s deployed at the Derazhnya and Pervomaysk missile complexes in the western USSR. There is agreement within the Intelligence Community that these SS-11s can attack either peripheral targets or targets in the US, and that—especially for arms control purposes—they would have to be included in any calculations of maximum Soviet capabilities to attack the US. There is still disagreement, however, as to the primary mission of these missiles. Briefly, *CIA* and *DIA* believe that their primary mission is peripheral attack; *Army, Navy,* and *Air Force* consider them to be primarily targeted against the US; *State* and *NSA* believe that their primary mission would depend on the situation as the Soviet planners viewed it at the time they prepared or revised their overall attack plan.

6. The Soviets are also believed to have a total of 77 training launchers, 58 at the test ranges, one at each of the SS-9, SS-11, and SS-13 complexes and one each at Derazhnya and Pervomaysk. All of these launchers presumably have an operational capability against the US. In addition, there are 11 research and development (R&D) launchers at the test ranges which might be so employed. We do not know how long it would take to prepare these categories of launchers for operational use.

7. The total number of ICBMs which could be targeted against the US, both now and as of mid-1972, is summarized in the following Table. It should be noted that these totals represent gross capabilities rather than an estimate of the numbers which are in fact likely to be targeted against the US at any given time. As indicated above, there is a difference of opinion as to whether the SS-11s deployed at Derazhnya and Pervomaysk are intended for this purpose. In any case, all of the missiles nominally available almost certainly would not be used in an initial salvo against the US. For example, the long-standing emphasis of Soviet military doctrine on maintenance of substantial reserve capabilities suggests that Soviet planners would wish to withhold some portion of their ICBM forces from an initial attack in order to take care of contingencies.

ESTIMATED SOVIET ICBM LAUNCHERS
1 OCTOBER 1971-MID-1972*

	Deployed Forces	
	1 October 1971	Mid-1972
Soft		
SS-7 [a]	124	124
SS-8 [a]	10	10
TOTAL	134	134
Hard		
SS-7	66	66
SS-8	9	9
SS-9	276	288
SS-11	850	850
SS-13	40	60
TOTAL	1,241	32
SUBTOTAL	1,375	1,407
SS-11s at Derazhnya and Pervomaysk [b]	120	120
TOTAL	1,495	1,527
	Other [c]	
Training Launchers		77
R&D Launchers		11
TOTAL		88

*This Table does not include the new launchers now believed to be under construction at several missile complexes and at Tyuratam, because it is not known what types of missiles will be deployed in them or when they will become operational.

[a] Each of the soft SS-7 and SS-8 launchers has a capability to launch a refire missile in 2 to 4 hours after the initial launch.

[b] There are differing views concerning the primary mission of these SS-11s. All are agreed, however, that they could be used against the US.

[c] Most of these launchers probably could be readied to fire at the US, although we are unable to make any valid estimate of the time required to do so or the availability of missiles for them.

New Deployment Program

8. We believe that construction of two, possibly three, new types of silos is underway at the test center at Tyuratam and at some complexes in the field. The purpose of the new silos is not clear. They may be intended to house wholly new missiles, variants of present missiles, or existing types in a program aimed at increased survivability. Some may not be intended for missiles at all. We believe that at least one new missile system has been under development for some time and is probably nearing the flight test stage; it may be intended for one of the new type silos. It would require about two years of testing to reach initial operational capability (IOC).

II. THE SS-9

Introduction

9. The SS-9 is the only missile now in the Soviet arsenal which could have the necessary combination of yield and accuracy to threaten US land-based ICBMs and other critical hard targets. (See Figure 2 for comparison of basic characteristics of Soviet ICBMs.) Consequently, estimates of its characteristics and capabilities have assumed a unique importance, compared to those of other Soviet weapon systems, in their impact on US defense planning and on US thinking about requirements for an agreement limiting strategic arms. Last year, new deployment of the SS-9 evidently ceased. Thus the danger that the SS-9 as such might be deployed in sufficient numbers to threaten the survival of the Minuteman force has receded, though it remains to be seen whether the missile or missiles for the new silos will pose such a threat. At least for some years to come, however, the SS-9 system will remain a formidable operational element in the Soviet ICBM force.

10. We still lack a clear picture of all the factors which led to the initiation and later unfolding of the SS-9 program over the course of the last decade. The initial impetus to build the SS-9, a much improved follow-on to the SS-7, may have resulted from "historical technical considerations" without special regard to its strategic implications, as one Soviet SALT delegate has asserted. The deliberate effort to increase accuracy as well as payload in the original design, however, together with later moves to improve the quality of guidance components, creates a presumption that a capability to attack hard targets was at least one of its major design objectives. The picture is clouded by the fact that the Soviets by now have developed four different versions of the SS-9—the single RV Mod 1 and Mod 2 which were developed first, the Mod 3, which has been tested both as a fractional orbit bombardment system (FOBS) and as a depressed trajectory ICBM (DICBM), and the Mod 4 with its three RVs.[4]

11. [redacted]

[4] The four variants utilize the same basic two-stage vehicle, with the primary differences among them being in their payloads.

12. [ ] the two oldest variants—and particularly the heavier Mod 2—make up most of the present force. [ ]

13. The problems of understanding the SS-9 program are further compounded by uncertainties about the missile's performance and the need to rely on judgments or assumptions to resolve them.

14. In last year's Estimate, we focused on four of the most significant uncertainties about the performance of the missile system:

a. The range of the heavier of the two single RV variants (the Mod 2)—specifically the capability of this variant to reach Minuteman complexes.

b. System accuracy and the effect which this has on the SS-9s potential against hard targets. (This is an important consideration for all variants except the Mod 3 which does not have sufficient accuracy to make it a hard target weapon.)

c. The capabilities and likely mission of the Mod 3, particularly in the fractional orbit mode.

d. The capabilities and likely mission of the Mod 4 with its multiple re-entry vehicles.

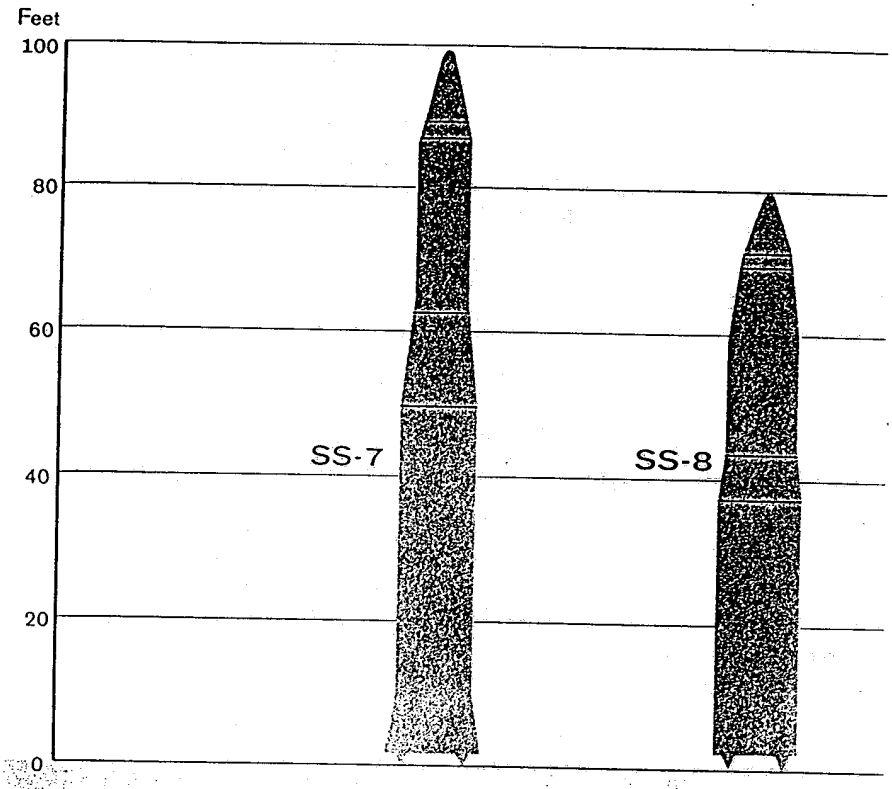
15. Since publication of NIE 11-8-70, "Soviet Forces For Intercontinental Attack", [ ] dated 24 November 1970, TOP SECRET, RESTRICTED DATA, there has been no new evidence to serve as the basis for resolving any of these issues. Analysis of the old data has continued, however, and there has been a concerted effort among the USIB agencies to isolate and narrow differences in interpretation of the available evidence. The Mod 2 range problem has been at least partially resolved [ ]. Continuing study of data relating to SS-9 accuracy has resulted in some analytical refinements and adjusted agency positions, but no additional information has become available on [ ] the primary basis for differing views. As far as the Mod 3 is concerned, there is now general agreement on the demonstrated and potential capability of the vehicle, although an apparent anomaly persists concerning its employment in a FOBS role. In-depth analysis of the four Mod 4 firings of October-November 1970 has cast doubt on the preliminary judgment in NIE 11-8-70 that the Soviets appeared to be testing a multiple independently-targetable re-entry vehicle (MIRV), and there are divided views as to whether the Mod 4 is an MRV or an MIRV. The discussion which follows presents the results of new analysis on each of these four issues.

The Range Problem

16. The SS-9 with the 9,500 pound Mod 1 RV has been flight tested from Tyuratam to a range of 6,600 n.m. non-rotating earth (NRE),[6] enough to reach targets anywhere

[6] The actual range of these firings was 7,100 n.m., but included effects of the earth's rotation which in this case added an increment of about 500 n.m. Missile ranges quoted in this Estimate, therefore, are expressed in terms of NRE distances. Ranges achievable in operational firings northward to the US from the USSR are in some cases increased, in some cases decreased, as a result of the earth's rotation, depending on the specific launch points and target directions involved.

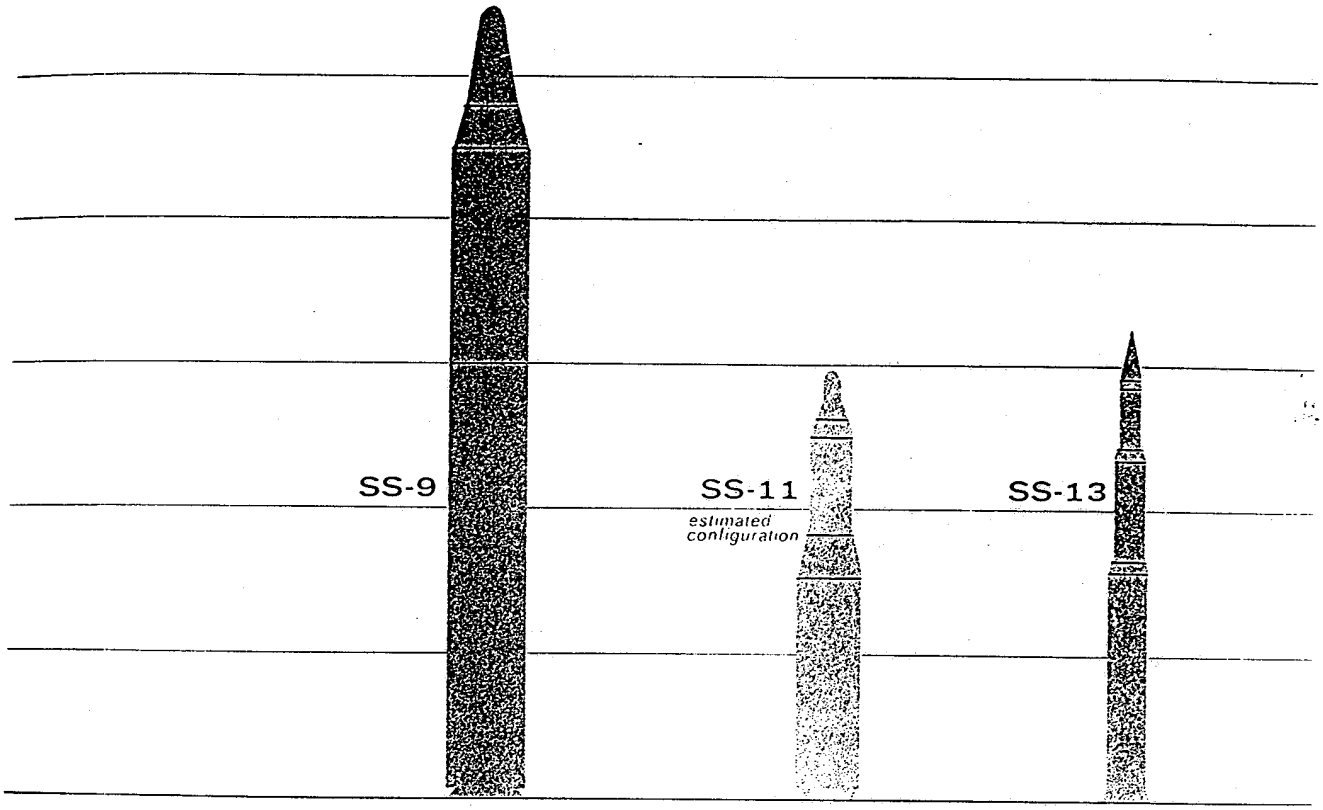
Comparison of Soviet ICBMs



	SS-7 Mods 1,2	SS-7 Mod 3	SS-8
Year Operational	1962-63	1963	1963
Maximum Operational Range (NRE)	6,500 nm	5,500 nm	6,000 nm
Warhead Yield			
Accuracy (CEP)			
Deployment Mode	soft pads or triple silos	soft pads or triple silos	soft pads or triple silos

560799 1-72 CIA

Figure 2



Mod 1	Mod 2	Mod 3	Mod 4	Mod 1	Mod 2	Mod 1	Mod 2
1967	1966	1969	see text	1966	see text	1969	see text
7,000 nm	see text	see text	5,500 nm	5,500 nm	6,000 nm	see text	see text
see text	see text	1-2 nm (DICBM) 1.5-3 nm (FOBS)	see text	about 1.0 nm			
single silos (6 per group)	single silos (6 per group)	single silos (6 per group)	single silos (6 per group)	single silos (10 per group)	single silos (10 per group)	single silos (10 per group)	single silos (10 per group)

TOP SECRET
RESTRICTED DATA

in the US from any of the SS-9 launch complexes. The Mod 2, however, carries a payload of about 13,500 pounds. With R&D instrumentation, it has, on only two occasions (in November 1965), been flight tested to a range of 4,400 n.m. NRE[

No other Mod 2 has been tested as far. This range is sufficient to reach only the extreme northwestern portion of the US from the closest SS-9 deployment complex. The pitch program used on the 4,400 n.m. flights produced a minimum energy trajectory, i.e., that trajectory required to obtain maximum range. The SS-9 Mod 2 has also been flight tested to a range of 4,200 n.m. using a pitch program that results in a lofted trajectory and therefore a lesser range capability.

17. To attack major US targets, and particularly the Minuteman complexes, the SS-9 Mod 2 would have to be capable of attaining greater range than has been demonstrated. Specifically, the spread of ranges from SS-9 complexes to various hard targets in the US (Minuteman and Titan silos, NORAD and SAC Headquarters and the US alternate NMCC at Ft. Ritchie) varies from about 4,600 to 5,500 n.m. In the case of Minuteman silos alone, the figures are 4,600 to 5,200 n.m. Analysts have therefore searched for ways in which the range of the Mod 2 could be increased beyond that actually demonstrated in flight tests.

18. In NIE 11-8-70 we noted that range could be increased both by consuming more propellants (thereby leaving smaller residuals), and by removing the telemetry package or packages placed on the missile for test shots. It was speculated that the Mod 2 propellant utilization system might be as good as that used on the SS-9 Mod 3.[

]There was disagreement over the weight of instrumentation packages which could be removed;[

]

19. There were substantial differences over the maximum range of the SS-9 Mod 2. CIA, NSA, State, Army and Navy estimated a maximum range of 5,000 n.m. by assuming a minimum energy trajectory and[

]DIA and Air Force assessed the maximum operational range of the Mod 2 on the same trajectory at about 5,400 n.m., on the basis of its apparent role and[

]

20. Additional analysis during the past year indicates that some of the SS-9 Mod 1s and Mod 2s tested have had more energy than had previously been calculated.[

[ ]

21. All USIB agencies now agree that on a basis of technical analysis alone, the maximum range capability of the SS-9 Mod 2 is about 5,300 n.m. using a pitch program yielding a minimum energy trajectory, as demonstrated in some of the tests of the Mod 2. A maximum of about 5,100 n.m. is achievable using the pitch program producing a lofted trajectory as demonstrated on other tests.

By selective targeting of Mod 2 missiles, a 5,300 n.m. range capability would permit coverage of all six Minuteman complexes, one Titan complex, and NORAD and SAC Headquarters from at least one SS-9 complex. The remaining two Titan complexes and the US alternate NMCC at Ft. Ritchie would be beyond coverage by the Mod 2, but within Mod 1 range.

22. Additionally, DIA believes that, since minor variations in technical interpretations are possible, it is inadvisable to seize on any one maximum range between 5,100 n.m. and 5,300 n.m. Further, they believe that despite the apparent constraints indicated by the available technical data, the possibility of full coverage of Minuteman fields (i.e., all Minutemen by any SS-9 complex) by the Mod 2 should not be ruled out. They argue that if the Mod 2 was in fact deployed as an anti-Minuteman system, it would be highly uncharacteristic of the Soviets to deliberately put themselves in the position of dependence on extremely marginal technical capabilities. Moreover,

they would point out that the conclusion that the bulk of the SS-9 force is the Mod 2 makes its apparent range limitation critical in assessing the capability of the ICBM force. In light of these considerations, DIA believes that a maximum range of 5,500 n.m. for the Mod 2 should not be entirely ruled out.

The Basic Problem of Accuracy

23. As we pointed out in NIE 11-8-70, the two most important elements in determining the capability of a missile system against hard targets are the accuracy, or circular error probable (CEP),[8] of the system and the yield of the warhead. Of these, the more important is the CEP.

It is important, therefore, that the basis for deriving accuracy figures for the SS-9 be clearly delineated, including the uncertainties and requisite assumptions. The methods used to estimate SS-9 accuracy are summarized below.

24.

[8] See Glossary, page 91, for definition.

27. [

25. [

28. [

26. [

29 [

differing positions on the accuracy of the SS-9 system. The positions are as follows:

a. CIA, NSA, State, and Air Force

The SS-9 Mod 1 and Mod 2 CEP at a range of 5,300 n.m. is estimated to be 0.6[ ]n.m.

b. DIA, Army, and Navy

In view of the many uncertainties in our evidence and assumptions,

30. Although the views of most USIB agencies have converged, there are still two

32. [redacted]

believed that SS-9 Mod 1 and Mod 2 accuracy should be expressed as a range from 0.4 to 0.6 n.m. [redacted]

In addition, all agencies believe that it is possible that handling and maintenance of deployed missiles by operational personnel would degrade accuracy. We cannot judge the effect of such activities on the CEP of deployed missiles.

33. [redacted]

Yield

31. [redacted]

[redacted]

34.

The Mod 3 (FOBS/DICBM)

35. In December 1965, the Soviets began testing the third variant of the SS-9, designated the Mod 3. The Mod 3, a two-stage vehicle with an additional de-boost stage, has been successfully test flown in two modes. In one,

the FOBS mode, the RV is de-boosted from a low-earth orbit into an impact area on the Kapustin Yar test range after less than one revolution. In the other, the DICBM mode, it is fired into an ICBM trajectory with a very low apogee and de-boosted just prior to re-entry into the Kamchatka impact area or the central Pacific. Because of the low trajectory, any SS-9 Mod 3 launched northward toward the US would be detected much later by the Ballistic Missile Early Warning System (BMEWS) than would an ICBM flying a conventional trajectory, and the warning time to the US would be cut from about 15 minutes to 10 minutes or less, depending on the location of the target. A southward launch into orbit with de-boost over the US would be coming from the wrong direction to be detected by BMEWS. However, US sensors now being deployed promise to provide early detection of launches regardless of their firing direction.

36. A large amount of data is available on the SS-9 Mod 3 from the 23 firings of the system to date.[

37. It is quite clear from the evidence available that the basic SS-9 ICBM configuration is used for the Mod 3 with some minor modifications,[

38.[

] the Mod 3 has a CEP about 1.0 to 2.0 n.m. when fired as a DICBM or FOBS in a northerly direction to the US. The CEP of a southerly-launched FOBS would increase to 1.5 to 3.0 n.m. because of the longer flight time. These levels of accuracy make the SS-9 Mod 3 incapable of attacking hard targets with any reasonable probability of success. On the other hand, the trajectory shape connotes a desire to deliver an attack with less time for the enemy to react. These factors in combination suggest strongly that the Mod 3 was designed to attack strategic time-urgent soft targets, such as SAC bomber bases and command and control facilities.

39.[

] Because the utility of the Mod 3 appears limited to attacks on time-urgent soft targets, which are relatively few in number, we believe that the number

ultimately deployed will be small.[42.[

]

40. A very puzzling aspect of the SS-9 Mod 3 program—and one that we discussed in detail in NIE 11-8-70—concerns the capability of the system. The Mod 3 has been tested in the DICBM mode to a range of 6,300 n.m. and can unquestionably provide full coverage of the US on northerly trajectories from any deployed SS-9 site. The orbital tests, however, have been fired in an easterly direction and have relied on the advantage of the earth's rotation to achieve orbital velocity. An operational FOBS attack against the US would have to be launched on a northerly or southerly azimuth depriving it of most or all of this advantage. Without this advantage, the vehicle as tested in a FOBS role is not capable of inserting the payload into an orbit that would permit an attack against any target in the US on the initial orbit, on either northerly or southerly launches.

41.[

]

The Mod 4

43. The capabilities and likely mission of the SS-9 Mod 4, which has three RVs mounted above the second stage, remain a contentious issue. Preliminary analysis of a series of four firings occurring in October and November 1970, just prior to the publication of NIE 11-8-70, had led to the tentative conclusion that the Soviets were testing a MIRV, even though there had been no sign of this in the prior tests. In-depth analysis of these four firings, together with other evidence, both positive and negative, has caused a re-evaluation of this conclusion by some USIB agencies and there are a variety of positions concerning the status of the program and its purpose.

44. Prior to the firings in the fall of 1970, 17 flight tests of the Mod 4 had been detected between August 1968, when the test program began, and April 1970. These 17 flight tests can be divided into two groups, with the first consisting of seven flights, ending with three firings to the Pacific in April-May 1969. The second group of 10 firings, begun after a four-month hiatus, included two firings to the Pacific.

45.

46.

47.

48. [ ]

49. In NIE 11-8-70, we pointed out that a system of the type implied by the preliminary analysis of these tests would have the capability of attacking independently three separate targets. [ ] Such a system would have a limited footprint but would be capable of targeting the US Minuteman force if the necessary accuracy could be achieved. [ ]

50. With the yield estimated for each of the RVs, the single shot kill probability against hardened targets would be considerably lower than that of the Mod 1 or Mod 2.

There is no evidence that the Soviets are attempting to improve the accuracy of the SS-9 Mod 4 over that of the Mod 1 and Mod 2. Assuming present guidance accuracy (i.e., that for the Mod 1 and Mod 2), the CEP of each RV in the MIRV system postulated last year could theoretically be the same as for the SS-9 with a single RV, but could not be better. [ ]

51. Since last fall there have been a number of factors which have influenced USIB agencies in evaluating the purpose and current status of the SS-9 Mod 4 program. [ ]

52. The positions of the various USIB agencies on the capabilities and purpose of the SS-9 Mod 4 system are as follows:

a. CIA and State

The SS-9 Mod 4 is an MRV for use against soft targets, and it is unlikely that this system will be developed into a MIRV capable of attacking hard targets such as missile silos.

the Soviets may have completed the SS-9 Mod 4 test program. In addition, the likelihood that the Mod 4 is being deployed raises the probability that the Soviets now consider the system operational in its present configuration.

b. DIA and Air Force

Based on available evidence, it is impossible to make a high confidence judgment on whether the SS-9 Mod 4 is an MRV or an MIRV.

DIA and Air Force, therefore, conclude that the

Mod 4 program could represent either an MRV or an MIRV system with limited targeting flexibility. From what they have observed they believe that if the SS-9 Mod 4 is currently being deployed, it is more likely to be an MRV.

c. NSA, Army, and Navy

Available data does not provide the basis for a high confidence judgment on Soviet intent for the SS-9 Mod 4. However, the evidence does suggest that the system characteristics are more applicable to the intended development of a limited footprint MIRV than to a MRV.[

]

[

]further development of the Mod 4 as an MIRV may have been abandoned, perhaps because of unsatisfactory results. However, use could be made of this system today as an MRV.

The evidence suggesting Mod 4 deployment is inconclusive,[

]However, if it is being deployed, it could well be due to a decision by the Soviets to make some use of the system in view of their substantial investment.

Roles and Missions of the SS-9

53. Most of the military and military-related installations which would probably be on Soviet target lists could presumably be dealt with satisfactorily by the less accurate, low yield weapons which make up the bulk of Soviet intercontinental attack forces. These installations include strategic bomber and ballistic missile submarine bases, unhardened elements of air defense and antiballistic missile (ABM) systems, various kinds of communications and administrative centers, military depots, and military-industrial facilities.

54. Some potential targets, however—notably Minuteman and Titan silos and LCCs, as well as National Command Authority facilities, SAC and NORAD Headquarters, and other hardened command and communications facilities—could be attacked effectively only by weapons with the high yield and the relatively high accuracy of the SS-9 Mods 1 and 2. The extent to which the SS-9 force is in fact targeted against such critical hard targets remains unclear, for the available evidence is scanty and inconclusive.

55. There is general agreement that the SS-9 was initially developed to provide better accuracy and a larger payload than the SS-7, presumably for use against hard targets. Moreover, it seems highly unlikely that the Soviets would develop and deploy a weapon as uniquely powerful and expensive as the SS-9 (each costs roughly two and a half times as much as an SS-11) if it were not to be assigned a mission for which smaller missiles are less suitable. Such evidence as we have suggests that at least initially, most SS-9s had US ICBM complexes as their primary targets.

56.[

[ ]

57. Additional questions about how the Soviets intend to target the SS-9 force have been raised by the development of the Mod 3 and Mod 4. The Mod 3 is probably deployed in limited numbers [ ] but there is uncertainty about the deployment status of the Mod 4. Even in limited numbers, both versions could be militarily useful against soft installations—the Mod 3 against time-urgent targets, and the Mod 4 against defended targets. Any deployment of these newer versions of the SS-9 in lieu of Mod 1s and Mod 2s would reduce the number of the latter which would be available for strikes against hard targets—a mission which none of the other Soviet ballistic missile systems is now demonstrably capable of performing effectively.

58. It seems quite likely that at least a few SS-9 Mod 2s are earmarked for key hard targets like SAC and NORAD Headquarters. We cannot rule out the possibility that others are aimed at major urban complexes deemed vital to US military and economic survival. On the other hand—and particularly if we are correct in our basic assessment of Soviet targeting philosophy—it is difficult to conceive of the Soviets not trying to eliminate as much as possible of the US ICBM capability, presumably through attacks on LCCs and other control facilities. We therefore believe that at least some, and perhaps the bulk, of the SS-9 Mods 1 and 2 deployed are aimed at US ICBM installations.

59. The Soviets have not deployed SS-9s in sufficient numbers to provide assurance of putting more than a small portion of US launch facilities out of action. Such targeting would probably still make sense, however, from the Soviet military planners' point of view. It is often argued that in view of the immense destructive power of nuclear weapons, the development of capabilities for attacking the enemy's strategic forces is pointless in modern war unless his forces can be overwhelmed in a first strike. We believe that the Soviet military leaders would regard this as an unduly passive, all-or-nothing approach. They are pressing ahead with a large-scale antisubmarine warfare (ASW) program which they almost certainly recognize is at best likely to reduce rather than eliminate the missile submarine threat. They have built up massive defenses against high-flying aircraft without waiting to achieve comparable capabilities against low-level penetration tactics.

60. Given the unprecedented uncertainties of the nuclear battlefield, the Soviet planner would hope that attacks on the enemy's strategic forces might significantly contribute to national survival. In a pre-emptive strike, he would probably seek to reduce the weight of enemy attack as much as practicable without necessarily eliminating it. Even in a retaliatory second strike, he might see need for some targeting against the enemy's strategic forces so as to deny his adversary the opportunity to undertake follow-up strikes, to repair weapons that failed to get off because of technical problems, or to continue use of facilities such as bomber and submarine bases. For these missions, the four variants of the SS-9 could play a significant role.

III. THE SS-11

61. The SS-11, which makes up some 60 percent of the Soviet ICBM force, has been operational since 1966. It is a small, two-stage ICBM using storable-liquid propellants and an all-inertial guidance system. All presently deployed SS-11s are believed to be of the initial Mod 1 type, but testing of two distinct

versions of a modified vehicle (Mod 2) began in July 1969. The new vehicle probably has been flight tested sufficiently to be deployed, and retrofit of some existing silos with the Mod 2 could occur during 1971.

62. The SS-11 Mod 1 has been test fired to a range of about 5,200 n.m. (NRE). Allowance for [ ] results in a range of about 5,500 n.m. (NRE). This range is sufficient to cover almost all of the US from the complexes where the SS-11 is deployed, although no single Soviet complex can attack all likely US targets. In mid-1968 there were SS-11 tests to ranges of 500-600 n.m., presumably to establish the capability of the missile for peripheral attack. The Mod 1 carries an RV estimated to weigh about 1,500 pounds, although some limited recent data (see footnote to paragraph 66) suggest it may be several hundred pounds heavier.[15] The SS-11 Mod 1 is estimated to have a CEP of about 1 n.m., and a yield of [ ] making it unsuitable for effective use against hard targets.

63. The Mod 2 development program apparently is intended to enhance the penetration capability of the SS-11 against ABM defenses. The Type A version of the Mod 2 carries what probably are exoatmospheric penetration aids [16] along with a new RV. The Type B version apparently carries 3 separate RVs which would all hit at or near a single target; if sufficiently hardened, however, they could present 3 separate aiming points to a defending ABM system. (See Section V, paragraph 83.) Both versions have a throw weight of about 2,300 pounds, compared to the 1,500 pounds noted above for the Mod 1 RV. Sufficient propellant has been added to the first stage, however, not only to compensate for the increased payload but also to extend the range of the missile to about 6,000 n.m. (NRE). The warhead on the Type A version is estimated to have [ ] The Type B warheads probably have a yield [ ] There has been no change in the guidance for the Mod 2, so Mod 2 payloads are suitable only for use against soft targets.

64. No new evidence has become available since last year on the Mod 2 Type A payload, which consists of an RV and one or possibly two objects which probably are penetration aids. These objects apparently are deployed in an in-line pattern, without appreciable cross-range dispersion. They apparently function during the exoatmospheric (and possibly the early re-entry) phase of the flight. In the one test for which re-entry radar data are available, the re-entry trajectories of the probable penetration aids became significantly different from that of the RV below 100,000 feet, and they probably burned up prior to impact. Visual observation of re-entry on two firings of this type to an extended-range Pacific Ocean area also indicated that only the RV survives to impact.

65. Although the objects which appear to be penetration aids can be distinguished from the RV in the terminal phase—by sophisticated radars at about 100,000 feet—they do sufficiently resemble genuine RVs for a defense to be forced to take them seriously. Moreover, the ballistic coefficient of the Mod 2 Type A RV [ ] results in an increased speed of travel through the atmosphere and

[15] The SS-11, has never been displayed in Soviet military parades. [ ]

[16] For the purposes of this paper we define penetration aids as devices which may be included in the payload package of a missile system and dispensed in order to confuse defensive systems, to prevent them from identifying any RVs carrying warheads, or to saturate defenses beyond their capability. Although multiple RVs can serve to facilitate penetration, they fall outside the scope of this definition.

places a requirement on an endoatmospheric ABM system to react quickly. The Type A RV weight is comparable to or slightly heavier than the 1,500 pound RV of the Mod 1 SS-11. (See footnote to paragraph 66.) The remainder of the throw weight is devoted to the penetration aids system.

66. With respect to the Mod 2B, visual observations and optical data from two extended range tests to the Pacific in August 1970 indicated that it carries three objects which survive to impact. An analysis of several tests indicates that two apparently cylindrical objects do not survive re-entry and represent either exoatmospheric penetration aids or separation hardware. Data from subsequent tests have reinforced our judgment that the three surviving objects are RVs, intended to carry warheads, with radar cross-sections and deceleration histories to impact which are indistinguishable from one another. Given the estimated total payload weight, each of the three Type B RVs would weigh 500 to 750 pounds.[17] The ballistic coefficient of the three RVs—[redacted]—is even higher than that of the Mod 2A RV.

67. The Mod 2B is not a MIRV as tested to date and apparently is not intended to be one. As we understand the system used to separate the RVs, a new RV dispersal technique would have to be developed to achieve an independent targeting capability. If the system were to have a hard target capability, a new guidance system would be required as well.

68. The Mod 2B payload evidently is designed to facilitate penetration of ABM defenses by multiplying the number of warheads to be dealt with by a defender. In all but two of the 19 tests to date, all three RVs were directed at a single impact point and were released so as to space them out along their common trajectory and to impact successively rather than simultaneously. (In the single test to the Pacific, all landed within 1 n.m. of each other and without appreciable crossrange dispersion.) In one test to Kamchatka and one to the Pacific, the RVs were released so as to produce at impact a symmetrical crossrange spread of about 10 n.m. at extended range (i.e., the RVs landed about 5 n.m. apart). This last dispersal pattern, however, does not appear to provide any particular advantage and we do not know whether it represents an intended mode of employment or whether it was tested merely to check out the inherent flexibility of the system.

69. As indicated earlier, the ballistic coefficient of the Mod 2 RVs results in faster travel through the atmosphere, thereby reducing the reaction time available to an endoatmospheric defensive system. A bonus effect is the reduction of the re-entry contribution to system inaccuracy. There have been no accompanying improvements observed in the guidance system—the major source of system inaccuracy—in any Mod 2 flight test[redacted]

[redacted] Without basic changes in guidance mechanization, however, the Mod 2 would remain a soft target weapon, and extreme accuracy is evidently not a design goal. The CEP of the Mod

2A and the centroid of impacts of the Mod 2B is estimated to be 0.6 to 0.7 n.m.

70. The SS-11 Mod 2 has been tested 34 times since July 1969, 15 times in the 2A version and 19 times with the 2B payload. Four test flights, two of each type, were conducted to the 4,400 n.m. Pacific impact area in the summer of 1970. In the past, extended range firings in the Pacific have usually presaged the end of the R&D test firing program. Since the Pacific firings, only one Type-2A launch has occurred, in December 1970. There have been nine more Mod 2B firings through September 1971, but this part of the program is probably also near its end. Thus, operational deployment could begin this year for the modified SS-11 with either or both payload types.

71. Three Mod 2 R&D tests, two Type-A and one Type-B, were to reduced ranges of about 550 n.m. These short-range firings were presumably tests of the capability of the Mod 2 to perform in a peripheral attack role. Similar short-range firings in mid-1968 were conducted with the Mod 1. There are no ABM defenses present or contemplated in Europe, however.

IV. THE SS-13

72. The SS-13 is a three-stage solid-propellant ICBM somewhat larger than the US Minuteman. Although the SS-13 underwent initial development in the early 1960s, probably in competition with the SS-11, the Soviets evidently encountered difficulties in applying solid-propellant technology in this case and the program lagged. Flight testing did not begin until late 1965 and IOC was not reached until 1969. Thus far the Soviets have deployed only one version of the SS-13, though flight testing of a second variant began in early 1970 and may be close to completion.

73. Less is known about the operational and technical characteristics of the SS-13 than about any other deployed Soviet ICBM, although it evidently is suitable only for use against soft targets.

These data indicate that the RV is quite blunt

Performance data indicates that the RV weighs about 1,000 pounds. The yield of the warhead associated with this vehicle is estimated at

74. The SS-13 appears to use a self-contained, all-inertial guidance system.

While we have no direct evidence on accuracy, our best judgment, taking account of likely errors caused by the blunt RV, as well as probable limitations of the guidance system, is that CEP is probably of the order of 1.0 to 1.5 n.m.

75. To date the SS-13 has been tested to a maximum range of only 4,500 n.m.,

a demonstrated capability sufficient to reach only the extreme northeastern portion of the US from the one complex where the SS-13 is believed to be deployed.[ ]could increase its range with the same payload to about 5,000 n.m. sufficient to cover targets north of a line extending from southern Oregon to Raleigh, North Carolina.[ ] the maximum range capability of the SS-13 is unknown. A range of about 5,500 n.m., enough to cover virtually all of the US, could be achieved, however, if [ ]

76. Flight testing of the SS-13 Mod 2 began in early 1970. Thirteen firings have been conducted, the last on 27 March 1971. All of the flights have been from Plesetsk, with three intended for impact at 1,060 n.m. near Norilsk, eight intended for 3,000 n.m. impact on Kamchatka, and two for about 4,500 n.m. in the Pacific. One 1,060 n.m. and one Kamchatka flight failed; all other flights apparently were successful. [ ]

77. Despite the advanced state of the SS-13 Mod 2 program, we still lack sufficient evidence to be confident about its aims. It is apparent, however, that the program does not involve development of multiple RVs or penetration aids.[ ]indicates that the Mod 2 uses a new RV with a higher ballistic coefficient. [ ]Although some slight modifications may also have been made in some or all the three booster stages, no significant changes from the propulsion system of the Mod 1 have been identified in SS-13 Mod 2 flights. The system CEP is probably slightly better than that of the Mod 1 due to the higher ballistic coefficient of the RV, but the small improvement involved would not be significant. Although we do not fully understand the reason for the flights which went only to 1,060 n.m., one purpose may have been evaluation of the system at less than ICBM range.

V. DIMENSIONS AND DIRECTIONS OF RESEARCH AND DEVELOPMENT ON INTERCONTINENTAL BALLISTIC MISSILES

General

78. There were 52 R&D firings of Soviet ICBMs in 1970, the highest ever. This compares with 16 in 1969 and 45 in 1966, the previous high year. The pace of testing has since fallen off sharply, however—only seven tests have taken place so far this year. The decline is not surprising, since the three R&D programs under way in 1970 appear about over. That for the two SS-11 Mod 2 variants continued into 1971 but, with 34 tests now completed, it is probably close to an end. The SS-9 Mod 4 has already been tested 21 times, but not since 5 November 1970. There has been only one R&D test this year, in March, of the SS-13 Mod 2. With 13 tests completed to date, this test program appears to be heading into its late stages.

79. We believe that one, possibly two, new ICBMs are now under development. We are uncertain, however, about which, if any, of the new types of silos are intended for new ICBM systems. The picture should become clearer, however, once the Soviets begin flight testing the new system, or systems.

80. Last year in NIE 11-8-70, we expressed the view that the Soviets would concentrate on the improvement of existing systems rather than on the development of new ICBM systems requiring entirely new launch facilities. This judgment is now in question because of the new silo programs and the likelihood that one, possibly two, missiles are nearing the flight test stage. In any case, the Soviets have recently finished developing variants for all but the oldest of the presently deployed ICBM systems. With work on a new missile or missiles for the new silos likely to be the focus of attention for the next two or three years—there is no evidence of other major activity at the ICBM test ranges—any other variants or follow-on systems appear unlikely to reach the test phase much before 1975. In light of the magnitude of Soviet developmental work in solid propellants, however, and our uncertainties about their progress, testing of a new solid-propellant ICBM might begin before then.

81. We can say very little about the course of Soviet R&D in the latter half of the decade; evidence is lacking and extrapolation from the present becomes more unreliable. Clearly, however, the Soviets will want to modernize their force to take advantage of technological advances, or to correct shortcomings which exist or may develop. In view of the size and capabilities the ICBM force has now achieved, we continue to believe that the Soviets will have strong incentives to do this, to the extent possible, by modifying or improving existing systems rather than by completely replacing them.

Specific Areas of Research and Development

82. *Penetrating Antiballistic Missile Defenses.* The Soviets have clearly been concerned with the problem of penetrating ABM defenses. The SS-11 Mod 2A carries one or more exoatmospheric penetration aids—the first Soviet ICBM to exhibit that capability. The use of three RVs on the SS-11 Mod 2B provides another means of facilitating penetration. Whatever its design objective, the SS-9 Mod 4 would also serve this purpose. The pace of the SS-11 Mod 2 program in particular suggests a desire to have the new system ready for deployment long before any US ABM could be operational. The Soviets may have felt they needed such a long lead time in order to perfect their penetration systems and to equip a significant portion of their force with them. Another incentive may have been a desire to have such hardware perfected in advance of any agreement limiting strategic arms.

83. The three RVs of the SS-11 Mod 2B and the SS-9 Mod 4 would have to be hardened to withstand the nuclear effects of defensive weapons (and possibly also to avoid "fratricide"[19]) if they were to be effective.[ ]The Soviets are presumably well aware of this problem and have done research in the area. Hence we believe that at least some degree of hardening has been provided for these systems.

84. *Survivability.* We had expected that the survivability of their land-based ICBM force would in time be of increasing concern to the Soviets, but in NIE 11-8-70 expressed the view that they might regard silo hardening as too expensive and might instead look to sub-

[19] Fratricide takes place when an incoming warhead is put out of action as the result of the detonation of an earlier incoming warhead.

marine-launched ballistic missiles (SLBMs) and perhaps land-mobile systems to provide highly survivable retaliatory forces. They may have decided to harden at least a portion of their force against a first strike or preemptive attack. In arguing against US plans for defending Minuteman fields with Safeguard[ ] Soviet SALT delegation asserted that hardening measures alone were sufficient to insure the survivability of land-based ICBMs. The Soviets may also have been influenced by the expectation that limits would eventually be placed on SLBMs as well as ICBMs under an arms control agreement and by increasing skepticism about land-mobile strategic systems.

85. *Mobile Systems.* Land-mobile ICBMs would provide an alternative means of improving the survivability of retaliatory forces, and they represent an area of weapon development in which the Soviets may still feel they have an edge on the US. Furthermore, Soviet delegates at SALT have indicated that the USSR wishes to retain the option to deploy such systems. There is no conclusive evidence, however, that the Soviets presently intend to develop them. The one mobile missile program which appeared to have a potential ICBM application—the SS-X-15—has probably been cancelled[ ] That missile, which was probably intended to be carried by the Scrooge transporter-erector-launcher displayed in Moscow parades, was flight tested only eight times between February 1968 and August 1969. We have also noted a halt in testing of the SS-14, a mobile MRBM system—there have been no firings since March 1970—suggesting that the Soviets are dissatisfied with that program as well.

86. On balance, the record suggests that the Soviets have lost interest in land-mobile ICBM systems, at least for the present. This may be a consequence of their recognition of the practical difficulties in deploying and maintaining the large and complicated pieces of equipment which would be required.

87. *Accuracy.* There is still no direct evidence that the Soviets are taking the steps that would be required for them to improve significantly the CEPs of their missiles. We have noted in past estimates that Soviet RVs have ballistic coefficients (betas) considerably lower than those of US RVs and that one of the things the USSR could do to improve accuracy would be to go to RVs with higher betas. In tests of the SS-11 Mods 2A and 2B, as well as the SS-13 Mod 2, we have noted moves in this direction.[ ]

88. Although an increase in betas is a necessary step to achieve greater accuracy with inertial guidance systems, it would not provide very high accuracy in the absence of improvements in guidance. Improvements sufficient to give system CEPs of about 0.25 n.m. could come about through normal advances in present technology, but an improvement in accuracy to say 0.15 n.m. would require the Soviets to go to wholly new techniques of guidance. Whether the Soviets decide to do this will depend on future targeting requirements and particularly on how much stress is placed on improving capabilities to attack land-based ICBMs.

89. *Multiple Independently-targetable Reentry Vehicles (MIRVs).* We continue to believe, as we have for some years, that the Soviets will develop MIRVs for their ICBMs, including some with accuracies providing a

capability to attack hard targets. Increasing the number of available RVs by means of MIRVs would also be useful for penetrating ABM defenses and for enhancing the retaliatory capabilities of ICBMs surviving a preemptive attack. There have been various indications, some quite explicit, that the Soviets regard this as an important area of strategic weaponry in which they have need, for political as well as military reasons, to catch up with the US.

90. A MIRV based on SS-9 Mod 4 technology could reach IOC by late 1972, assuming early resumption of testing and no further holdups in the program. One becoming operational that soon, however, would be no more accurate than the present SS-9. Thus its effectiveness against hard targets would be limited, though it might be useful against some large soft targets where varied spacing of individual RVs was desirable.

91. Development of a hard target capability with the Mod 4 would require an improved guidance system and still another year's testing, delaying IOC to late 1973 at the earliest. If we are correct in our judgment that a new and improved large missile system would be available by then, however, development of the Mod 4 as a hard target weapon would appear unlikely.

92. The Soviets might seek a MIRV based on a different dispersal technique, such as that represented by the "bus" system used by the US. If so, we would expect it to be developed in conjunction with a new missile. Allowing for a normal test program, such a system could not reach IOC until the end of 1973 at the earliest if testing began soon. Accuracies on the order of .25 n.m. could be achieved within the same time period.

93. The first indications of the direction of Soviet ICBM R&D are likely to emerge from the flight test program which we expect to start soon. Our best present judgment is that this program will involve MIRVs as well as increased accuracy and better hard target capabilities. We doubt that other possible improvements presently enjoy as much priority. A failure to make effective moves in these directions relatively soon would imply either that we had misjudged Soviet intentions or, less likely, that the Soviets were lagging in development of the necessary technology. In any event, we would expect to determine the major objectives of the program relatively soon after testing begins.

Implications of Strategic Arms Limitation Talks

94. The dimensions and directions of ICBM R&D will be heavily influenced by the outcome of the SALT negotiations. Under an agreement, the Soviets would probably wish to continue vigorous R&D across the board, at least initially, as a hedge against an early breakdown of the agreement. They might also seek to compensate for limitations on numbers of launchers by exploring avenues of research they would reject in a non-SALT environment, and by moving more rapidly to develop advanced MIRVs, higher accuracies, and other qualitative improvements. After an agreement had been in effect for some years and a stable strategic relationship had developed, however, the Soviet leadership might feel that it could safeguard its position at more modest levels of effort.

VI. SUBMARINE LAUNCHED BALLISTIC MISSILES

95. In the mid-1950s, the Soviets acquired a limited ballistic missile submarine capability by converting six diesel-powered Z-class attack submarines to carry two ballistic missiles each. Soon thereafter, production began on two new classes of submarines—the diesel-

powered G- and the nuclear-powered H-classes—both of which were designed to carry three 300 n.m. ballistic missiles. Production of these two classes ended in 1962 with the completion of 23 G-class and nine H-class units. The decision to halt construction probably was made in the late 1950s in connection with a decision, reported in classified Soviet writings, to divest the Soviet Navy of responsibility for carrying out strikes deep in enemy territory.

96. Shortly after the Cuban missile crisis, however—and probably in part as a reaction to that crisis—another reversal of course took place. Authorization was given to develop a strategic counterpart to the US Polaris force, based on the Y-class nuclear-powered ballistic missile submarine. Construction on the first of these 16-tube submarines is believed to have begun at Severodvinsk in 1964. This lead unit was probably launched in 1966 and production is believed to have increased rapidly since then. In 1969 the first Y-class submarine was probably launched at a second yard—Komsomolsk, in the Soviet Far East. The combined production from both yards is now estimated to be about nine units a year.

Current Force Levels

97. The Table below shows the estimated number and status of Soviet ballistic missile submarines as of 1 October 1971; the number of missile launch tubes is shown in parentheses.

98. Of the 23 Y-class units in operation, 19 are in the Northern Fleet and four in the Pacific. All 17 [20] of the units now estimated to be under construction or fitting-out probably will be operational by late 1973, bringing the operational force to 40 [20] units. Another Y-class unit almost certainly will be under construction by the end of October 1971 for a total of 41 [20] units, the same number as in the US ballistic missile submarine fleet. All 41 of these units could be operational by the end of 1973.

General Characteristics of Soviet Ballistic Missile Submarines

99. In terms of submerged displacement, the Y-class is the largest submarine in the world. [redacted]

[20] There is some evidence that an additional Y-class unit has been launched at Severodvinsk. If so, these numbers would be increased by one.

Class	Operational	In construction or conversion [a]	Outfitting or on sea trials	Total
G-I (3 Launchers)	7 (21)	4 (12-24)[b]	—	11 (33-45)
G-II (3 Launchers)	9 (27)	—	1 (3)	10 (30)
G-III[c]	0	—	1 [c]	1 [c]
H-II (3 Launchers)	8 (24)	—	—	8 (24)
H-III (6 Launchers)	1 (6)[d]	—	—	1 (6)
Y (16 Launchers)	23 (368)	12 (192)	5 (80)[e]	40 (640)[e]
TOTAL	48 (446)	16 (204-216)	7 (83)[c e]	71 (733-745)[c e]

[a] All units currently in construction or conversion probably will be operational by late 1973.

[b] At least one of these units is being converted to the G-II class; the others may be converted to the G-III class. See paragraphs 113 to 116 for a discussion of the G-III program.

[c] The number of launchers on the G-III submarine has not been determined.

[d] The H-III is not, strictly speaking, operational because as far as we know it has not yet been equipped with its missiles. See paragraphs 102 and 112.

[e] There is some evidence that an additional Y-class unit has been launched at Severodvinsk. If so, these numbers would be increased by one.

[ ] it is capable of speeds of about 30 knots[ ] The Y-class probably can operate at depths [ ] about 1,300 feet. Although the Y-class is not as noisy, and thus not as easy to detect and trail, as earlier classes of Soviet nuclear-powered missile submarines, it is still not "quiet" by US standards.

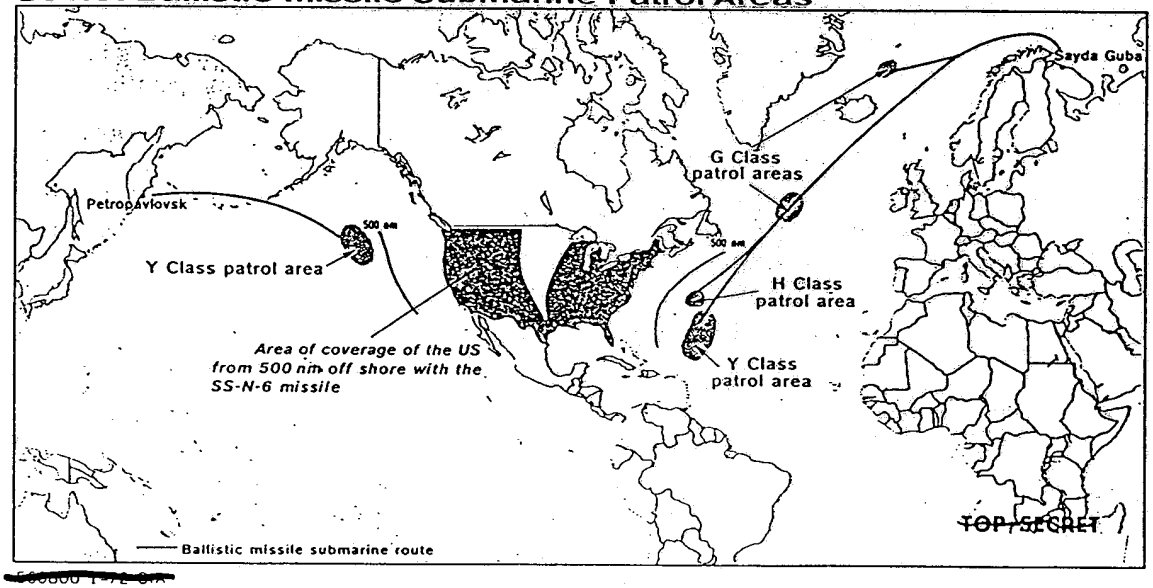
100. The SS-N-6 missile carried on the Y-class is a single-stage, storable-liquid-propellant system with a maximum range of about 1,300 n.m. With this missile, Y-class submarines can take station as much as 500 miles off the east and west coasts of the US and strike most major targets in the country; moving the submarines closer in or placing additional submarines in the Gulf of Mexico would permit virtually complete coverage of the US. (See Figure 3.) The SS-N-6 is equipped with a single 1,500 pound RV[ ] [ ] the missile has a CEP of about 0.4 n.m. Navigational inaccuracies probably would result in an overall system CEP of about 0.7 n.m., making it useful primarily against soft targets.

101. On the basis of limited evidence, it is possible to estimate a salvo time of less than 130 seconds for all missiles aboard a Y-class. This rapid a salvo time could raise problems with respect to such things as targeting accuracy but there is no technical reason why these problems cannot be solved. If they have not been solved, the actual salvo time might be greater—on the order of 3 to 5 minutes.

102. Of the nine H-class nuclear-powered submarines built between 1958 and 1962, eight have been converted to carry three 700 n.m. SS-N-5 missiles. These submarines have been designated the H-II class. The SS-N-5 can be launched while the submarine is submerged and has more than twice the range of the sur-

Figure 3

Soviet Ballistic Missile Submarine Patrol Areas



[redacted]

face-launched SS-N-4 which it replaced. The ninth unit, designated the H-III, has been extensively remodeled to provide it with six launch tubes instead of its original three. It has completed basic sea trials, but the missile which it is believed intended for—the 3,000 n.m. SS-NX-8—may not yet be ready for testing at sea (see "New Programs", page 43).

103. Of the 23 G-class diesel-powered submarines built between 1958 and 1962, ten have already been converted to carry three SS-N-5 missiles in place of the original SS-N-4s. One of these units was lost at sea in 1968. At least two more of the original G-class submarines also are being converted to carry the SS-N-5. The converted units have been designated G-IIs. We think that another G-class conversion program is now under way at Severodvinsk, but the purpose of this program is not yet known (see "New Programs", page 43).

Roles and Missions of Ballistic Missile Submarines

104. On the basis of its capabilities and of its patrol patterns, the entire Y-class force is almost certainly intended for use against the US, rather than peripheral targets. But only about four Y-class units are now maintained continuously on patrol—one in the Pacific and about three in the Atlantic—representing about 20 percent of the force. This rate has prevailed since the first Y-class patrol more than two years ago. It compares with about 50 percent for the US Polaris fleet. During the initial deployments in the Atlantic, Y-class submarines normally remained outside missile range of the US, but this has gradually changed. Currently, Y-class units are spending the vast majority of their time on patrol within missile range of the US.

105. The Soviets might choose to increase the percentage of the force on continuous patrol. Because of the lack of forward bases, however, they could probably maintain no more than about 30 percent continuously on station within missile range of the US. This could be increased to about 50 percent in crisis periods, but probably for no longer than about 60 days. Somewhat more than 30 percent of the force probably could be maintained continuously on station just beyond missile range of the US.

106. The Y-class force appears intended for use against urban-industrial or soft military targets, since its missiles lack the yield and accuracy to be effective against hard targets. Beyond this, we do not know how the Soviets intend to use the force. The Soviets may regard it as primarily useful for retaliatory or follow-up strikes. Certainly, as presently deployed, only 20 percent of the Y-class force could be used in a surprise attack. Alternatively, the Soviets may plan to move more Y-class units into range of US targets in the event that a serious threat of nuclear war develops. If so, as much as 80 percent of the force could be sent to sea. This force could then be used in an attack against soft, time-urgent military targets such as SAC bomber bases, but at the risk of compromising the fact that such an attack was in preparation.

107. In this connection, use of depressed trajectories with SLBMs would reduce the warning time available. At a range of 1,000 n.m., for example, the SS-N-6 fired on a trajectory with an apogee of about 100 n.m. would have a flight time of less than 11 minutes, as opposed to about 14 minutes with a normal trajectory. At a range of 600 n.m., flight time would be around 8 minutes, or in the neighborhood of the present reaction time for US B-52 bombers on alert. There has been no evidence to date that any Soviet SLBMs have been tested on such trajectories. Significantly lower than normal trajectories result in higher heating rates and greater dynamic pressure

loads on the missile which could cause structural failure. In addition, shallow re-entry causes degradation of accuracy. Thus, a flight test program probably would be required to determine the effects of depressed trajectories on the missile involved. We would probably detect the test program before its completion.

108. H-class submarines do not patrol on a regular basis in either the Atlantic or Pacific Oceans, and patrol activity by units of this class in the Pacific has declined during the past year, probably as a result of the increase in Y-class activity. There have been no H-class patrols detected in the eastern Pacific since January 1971, compared with three patrols in the same period last year. Two patrols, and possibly three, have been detected in the western Atlantic so far this year, compared with one during the same period last year. Although the H-class still is believed to be intended for use against intercontinental targets, it may be relegated to a peripheral attack role (as apparently was the case prior to 1962) when the Y-class program reaches its planned force goal.

109. Some G-class units are believed to be assigned to a peripheral and some to an intercontinental attack role, but it is not known how many, or which ones, are assigned to which mission. In previous years, G-class units have on occasion substituted for H-class submarines in a patrol area in the Pacific about halfway between Hawaii and the US. Since the initiation of Y-class patrols in the Pacific in late 1970, however, no G-class patrols have been noted there, suggesting that the nine G-class submarines now in the Pacific Fleet have been shifted to a peripheral attack mission, or are about to be. In the Atlantic, most G-class patrols have been in ocean areas almost equidistant from targets in the US and Europe and several days transit time away from possible launch areas against either. Since January 1971, however, at least two G-I class submarines have conducted patrols in the southern Norwegian Sea, within range of targets in Iceland and within a day's sailing time of likely launch positions against the UK. Thus, it appears that most of the G-class force may now be intended for use against peripheral targets.

New Programs

110. The only naval ballistic missile known to be under development now is the SS-NX-8. It has been undergoing flight testing since June 1969, and is the first two-stage SLBM to be tested by the Soviets. Its estimated maximum operational range is about 3,000 n.m. (One flight was to a range of 3,240 n.m., but the RV failed to separate from the second stage, so the burn time probably was longer than intended.) The SS-NX-8 is liquid-propelled and carries a single RV; there has been no evidence of the testing of penetration aids or depressed trajectories. The missile is believed to have a CEP of 0.5 n.m. or so, providing an overall system CEP of about 0.75 n.m.[21] [ ] this would limit the SS-NX-8 to use against soft targets.

111. The SS-NX-8, with its extended range, would significantly improve the flexibility and survivability of the Soviet SLBM force, but

[21] Rear Adm. Earl F. Rectanus, Director of Naval Intelligence, Department of the Navy, would note that [ ] a system CEP of 0.3 n.m. would be possible at 3,000 n.m. range. All other members of the Intelligence Community believe that the evidence is too tenuous to support the suggestion that the SS-NX-8 may have a system CEP of 0.3 n.m.

we continue to be uncertain about the status and likely pace of the test program, and about how the SS-NX-8 will be deployed. Although there have been 15 land-based tests of the SS-NX-8 so far, six of them were failures, and it is uncertain how close the test program is to completion. Only seven firings took place during the first 15 months of the program—a slow pace by Soviet standards. The rate of testing picked up beginning last November, and six firings were carried out in the following five months. Three of these six tests were failures, however, including the last one on 12 April. Testing resumed with two successful firings in September. If the program continues without further interruption, the missile could be ready for operational deployment by late 1972.

112. [ ] suggests that this missile is relatively large for an SLBM and may be about the same size as the Sawfly (40 plus feet long and 6 feet in diameter), a naval missile displayed in Soviet military parades in the late 1960s. A missile of this size appears too long to fit in Y-class submarines as they are currently configured. The eight H-class nuclear-powered submarines other than the H-III have recently completed an extensive conversion to carry the SS-N-5, making another conversion to carry the SS-NX-8 questionable. It also appears questionable that the Soviets would undertake a second retrofit of the G-II diesel-powered submarines.

113. Last year we thought it likely that 10 G-class submarines, which had not been converted to G-IIs, would be modified to carry the SS-NX-8. This now seems less likely though we cannot rule it out. Thus, even though the SS-NX-8 could be ready for deployment by late 1972, we are uncertain about Soviet plans for deploying it. We continue to believe, however, that the Soviets would want to provide themselves with extended range SLBMs. They might develop a new missile of extended range (at least 2,000 n.m.) which could fit in the present Y-class submarine with few or no modifications. The first retrofitted Y-class unit probably could not be operational before late 1974, even if testing began soon.

114. Another possibility is that the Soviets plan to deploy the SS-NX-8 in a new class of submarine but that they have delayed construction of the new class to concentrate on building up the Y-class force as rapidly as possible. If the Soviets do in fact deploy a new submarine for the SS-NX-8, the first units probably could not reach operational status until about 1975, considering the present commitment of production facilities to the Y-class and the long lead times involved.

115. This leaves the problem of what the Soviets intend for the newly converted G-class submarine, which we call the G-III. As noted above, it still cannot be entirely excluded that the conversion is for the SS-NX-8, and that others will follow. Another possibility is that the converted submarine is to be a one-of-a-kind test bed for a new and as yet unidentified missile, possibly solid propellant, and that the other G-I class units being converted at Severodvinsk will become G-IIs. Still another possibility is that the G-III is for the SS-N-6, and that some of the other G-Is in the Northern Fleet will be similarly converted. A confident choice among these alternatives will have to await further evidence.

116. If the G-III class is for the SS-N-6, then the modified submarine may be intended primarily for peripheral operations. The SS-N-6 is already being successfully deployed for purposes of intercontinental attack in the Y-class submarine, and in large numbers. Use of submarine-launched missiles against Europe was indicated in classified Soviet military lectures as recently as 1970, and deployment of the SS-N-6 on G-class submarines would be an

effective way of upgrading the capabilities of the peripheral SLBM force.[22]

VII. HEAVY BOMBERS AND TANKERS

117. Heavy bomber and tanker aircraft assigned to Long Range Aviation (LRA) form the third major component of the Soviet forces for intercontinental attack. LRA currently has about 200 heavy bombers and tankers based at five airfields in the USSR. These aircraft—the TU-95 Bear and M-type Bison—are the only Soviet bombers with a primary mission of intercontinental attack. In addition to the intercontinental mission, heavy bombers have other missions, e.g., attack against naval forces.

TU-95 Bear

118. There are about 110 four-engine turboprop Bear aircraft, and they form the largest element of the heavy bomber force. About 70 are the Bear B and C, equipped with a 350-mile air-to-surface missile (ASM), the AS-3 Kangaroo. Another 35, designated Bear A, are free-fall bombers. Five or six are Bear E reconnaissance aircraft which do not carry weapons. Only about 50 of the Bear ASM-carriers can be refueled in flight.

119. Bear aircraft pose the most serious bomber threat to the US, because of the size of the force and the range of the aircraft. They could cover virtually any US target on two-way missions. Non-refuelable variants would have to stage through Arctic bases to obtain extensive coverage of US targets, but refueled Bear Bs and Cs could operate directly from bases farther south. The range of the Bear gives it greater flexibility in routing and in the choice of flight profile than other bombers. Bear ASM-carriers would, of course, be able to launch their missiles far from the target to avoid terminal defenses.

120. Production of the strategic attack version of the Bear ended about seven years ago. Since then, limited production of special variants for reconnaissance and ASW work has continued, mostly for Soviet Naval Aviation.

M-Type Bison

121. The four-jet engine Bison is found only in LRA. The strike version carries bombs but not ASMs. At present, about 50 of the 85 Bisons are used as tankers to refuel the heavy bomber force and, on occasion, Bears assigned to naval aviation. The production of Bisons ended in 1961.

122. The Bison bomber has a more limited range than the Bear. Bisons would require Arctic staging and inflight refueling for extensive coverage of the US on two-way missions.

Force Size

123. The total size of the LRA heavy bomber force has remained relatively unchanged for over five years. The current strength is summarized below (figures are rounded to the nearest five).

	TU-95 Bear	M-Type Bison
Missile-Carriers	70	...
Free-Fall Bombers	35	35
Aerial Tankers	...	50
Reconnaissance	5	...
	110	85

[22] Rear Adm. Earl F. Rectanus, Director of Naval Intelligence, Department of the Navy, would note that most of the G-class deployments which have been detected in the Atlantic were in ocean areas almost equally distant from targets in the US and Europe and several days transit time away from possible launch areas against either. He has long believed that once sufficient nuclear-powered submarines become available, the G-class would be used primarily against peripheral targets. However, the G-III conversion clouds this role. It could be one of a kind, a test bed for a new naval ballistic missile. On the other hand, if the G-III turns out to be a class program for the remaining Northern Fleet G-Is, these G-IIIs would probably be used in the mid-Atlantic patrol area well into this decade.

124. LRA also has some 700 TU-16 Badger and TU-22 Blinder medium bombers based throughout the Soviet Union. These aircraft have a limited capability for intercontinental attack although some could be used on one-way missions if the Soviets felt a need to maximize an all-out nuclear assault against North America. However, the continuing evidence available on their training patterns, basing, deployment patterns, and the limited number of tankers for aerial refueling supports our judgment that Badger and Blinder forces are equipped and trained primarily for peripheral operations. The employment of large numbers of medium bombers through Arctic bases would raise serious problems in airfield capability and logistics.[23]

Roles and Missions of the Heavy Bomber Force

125. We believe that in a general war with the US, the Soviets would commit virtually all of their heavy bomber force to attacks against US targets. Soviet military writings indicate that the US targets would be practically the same type as those assigned to Soviet ballistic missiles. That the Soviets have retained a heavy bomber force under these circumstances probably reflects their desire to add flexibility and diversity to an attack, and to increase both the cost and complexity of US defenses. Increased survivability and penetration capabilities of the Bear force are provided by supersonic ASMs which have ranges up to 350 n.m. About half of the strike aircraft carry only ASMs, which have a CEP of some 1 to 3 n.m., and they would be primarily suitable for attacking soft targets. The remaining strike aircraft carry bombs, and have a hard target capability.

126. The training of the heavy bomber force continues to emphasize intercontinental missions. Bomber crews are believed to be proficient in all basic aspects of strategic air operations, including navigation, inflight refueling, bombing, ASM strike procedures, Arctic staging, penetration tactics, and employment of electronic countermeasures (ECM).

127. There is evidence that LRA Bears equipped with ASMs also have a mission of attacking US aircraft carriers. Heavy bombers of LRA have a long history of providing support to naval forces, including occasional participation in naval exercises. It is not clear, however, to what extent the Soviets would employ these aircraft in such a role, because the AS-3 Kangaroo missile is not known to have terminal homing. With a nuclear warhead, however, the missile would have some effectiveness against ships even with the guidance currently estimated for it.

128. There is still no evidence that the Soviets have an airborne alert force or that bombers are maintained on the ground in a quick-reaction posture comparable to the 15-minute alert posture of SAC. The entire Soviet complement of 195 heavy bombers and tankers normally is located at five airfields, each of which has only a single hard-surface runway. Unless redeployed to other fields, the force would be highly vulnerable to a surprise attack. The Soviets may have plans to disperse their bombers or to deploy some of them to Arctic staging bases during crises, although we have no evidence of such plans. We believe that bomber strikes by the LRA would follow those of Soviet ballistic missiles.

Backfire

129. The Soviets are flight testing a new twin-engine, variable-geometry wing bomber which was initially called the Kaz-A and is now designated the Backfire. (See Figure 4 for silhouettes of the Backfire and three other bombers.)

[23] NIE 11-14-71, "Warsaw Pact Forces for Operations in Eurasia", dated 9 September 1971, SECRET, discusses the use of medium bombers in the peripheral role.

130. The Backfire, sighted by a reliable observer in July 1970, was the subject of analysis and discussion in NIE 11-8-70. Certain characteristics were derived from the source's description of the planform of the aircraft and from an engineering design analysis based on the description. The results were used to assess its performance in various mission profiles. Where information on physical characteristics was not available, estimates were made based on our knowledge of Soviet technology, or, where necessary, on appropriate assumptions. We made such estimates on type of engines, fuel capacity, gross weight, and fuel consumption.

131. It was estimated that the Backfire, with an internal 6,600 pound bomb load, could achieve an unrefueled combat radius of about 3,000 n.m. by flying all the way subsonically at high altitudes with wings fully extended; with a 14,000 pound ASM the radius was 2,900 n.m. Flying a more likely profile, i.e., making a low-level approach of 200 n.m. to the target at high subsonic speed, the aircraft could carry such an ASM to a radius of about 2,650 n.m. A top speed of about Mach 2 at high altitudes and an aerial refueling capability were also estimated.

132. It was noted that with such capabilities the Backfire was greatly superior to the Badger and Blinder medium bombers for missions against Eurasian targets, particularly those deep in China, whose growing strategic importance to the Soviets could have been a strong stimulus to the development of the new bomber. However, on unrefueled two-way missions against the US, its capabilities appeared to be marginal. Refueled and staged from Arctic bases it could reach virtually all of the US on two-way missions only by flying the high altitude, subsonic profile.

133. At the time of NIE 11-8-70, it was not possible to make a confident estimate of the intended role of the aircraft. All agencies but the Air Force concluded that the Backfire was best suited for peripheral operations, but that it had capabilities for intercontinental attack. The Air Force concluded that the Backfire had capabilities which would make it suitable for use in either peripheral or intercontinental operations. All agencies recognized that the Backfire might have considerable growth potential which in the late 1970s could result in a variant with greater range.

134. In the view of all agencies but the Air Force, evidence acquired over the past year points to a radius/range capability of the Backfire less than was estimated in NIE 11-8-70, perhaps much less. The new evidence is not sufficient, however, to negate the previous performance estimates for postulated mission profiles. These agencies believe that no estimate can be made with confidence at this time. In the present state of knowledge, for a high-level subsonic mission with wings extended all the way, they believe that the unrefueled combat radius of the Backfire could be several hundred nautical miles less than the 3,000 estimated last year, conceivably as little as about 2,000 n.m. [redacted]

[redacted][24]

135. These agencies further believe that a determination of how the Soviets will employ Backfire must remain uncertain until there is better information on its range, on whether

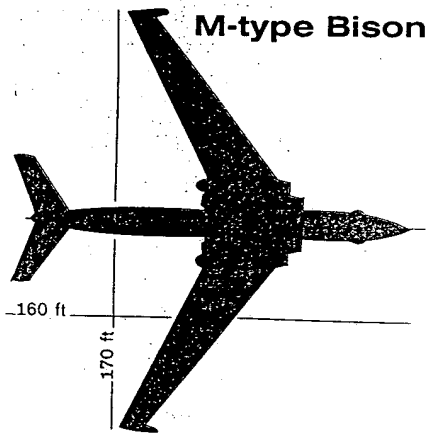
---

[24] Maj. Gen. Rockly Triantafellu, the Assistant Chief of Staff, Intelligence, USAF, would note that currently assessed performance is based on an engineering analysis of the observed configuration. He feels that [redacted] do not warrant a conclusion that the actual performance could differ significantly from the current high confidence judgment.

Figure

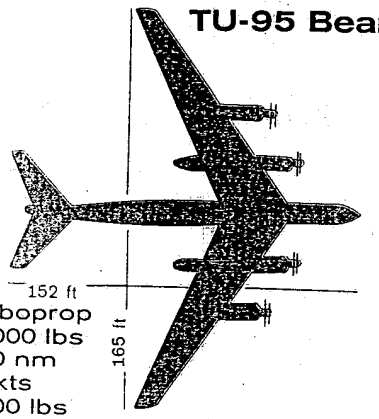
Bomber Silhouettes

M-type Bison



Engines	4 jet
Gross weight	400,000 lbs
Combat radius	3,050 nm
Cruise speed	445 kts
Assumed bomb load	10,000 lbs

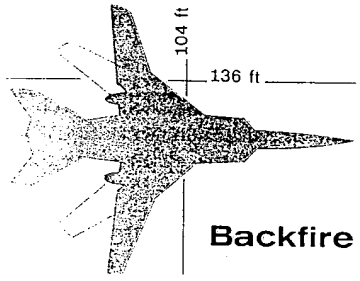
TU-95 Bear



4 turboprop
365,000 lbs
4,500 nm
435 kts
10,000 lbs

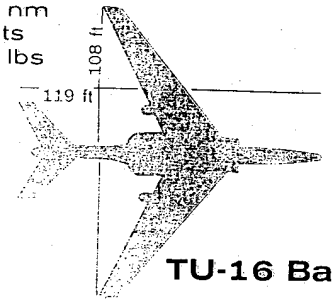
Engines	2 jet
Combat radius Cruise speed Assumed bomb load	see text

Backfire



2 jet
167,000 lbs
1,650 nm
445 kts
6,600 lbs

TU-16 Badger



[redacted]

[redacted]

or not a new tanker is developed, and on the tactics used in operational training. If its combat radius is only, say, 2,000 n.m., Backfire could be used by the Soviets both to modernize and to maintain the size of the force of bombers designed to satisfy their strategic attack requirements against NATO or China. In this role, Backfire could deliver heavier weapon loads, cover a greater range of targets, and stand a greater chance of penetration and survival than the Badger or Blinder. Moreover, Backfire could also be used by Soviet Naval Aviation, substantially upgrading its antiship strike force. With this combat radius, however, the limited intercontinental capability estimated for the Backfire in NIE 11-8-70 would be further degraded.[25]

136. The suitability of the Backfire for an intercontinental role will be heavily dependent on the existence of a suitable force of tankers. No tanker has been clearly identified with Backfire. Several aircraft such as the IL-62 (Classic) or the IL-76 (Candid) could be adapted to the tanker role, or a new one could be developed.

137. The evidence indicates that Backfire will carry an ASM. As yet, however, there has been no evidence which would permit identification of a specific missile. If an existing type is used, the AS-4 or AS-6 appear to be suitable. It is possible, however, that Backfire will carry a wholly new ASM; one designed for low-altitude launch would be a logical development.

138. Last year we estimated that the Backfire could reach IOC in the 1974-1976 period. We now believe that it could reach IOC as early as late 1973 as a free-fall bomber or if an existing ASM is used. If a new ASM is to be used, another year or two would be required. Considering the time that the aircraft has been available, the Soviets should have had time to evaluate its potential and a production decision could already have been made.

139. The Backfire may have considerable growth potential. If, for example, the Soviets were to develop high efficiency turbofan engines for it, the range of the Backfire could be increased. Such improvements in performance are not likely to appear in deployed aircraft before the late 1970s.

VIII. SOVIET INTERCONTINENTAL ATTACK FORCES: CONCEPTS FOR USE

Strike Options

140. Over the years, Soviet official pronouncements have said or implied that the USSR would never be the first to launch a nuclear attack and that its strategic forces would be employed only in retaliation. During the period of marked strategic inferiority, and, more recently, when the Soviets have pulled ahead of the US in the numbers of ICBMs, the Soviets have continued to stress that any aggressor would suffer a crushing retaliatory blow. In emphasizing the horrors of nuclear war they have regularly talked in terms of the certain "retribution"—to use Brezhnev's term—which Soviet strategic forces would inflict on any aggressor. At the same time, they have physically deployed their strategic arsenal in ways which indicate concern about having survivable forces which would be capable of retaliation. The Soviets have never shown any indication that they considered a bolt-from-the-blue disabling first strike to be a workable Soviet strategy, nor do they have counterforce weapons in sufficient numbers to make such a strategy feasible.

[25] Maj. Gen. Rockly Triantafellu, the Assistant Chief of Staff, Intelligence, USAF, believes that the assessed capabilities of Backfire make it suitable for both peripheral and intercontinental missions. The interpretations of the new information which question the assessed characteristics and performance are inconclusive and do not warrant a conclusion that the range/radius may be significantly less.

141. By their actions, the Soviets seem to have also discounted the possibility of a sudden first strike by the US, despite ritual references in their propaganda over the years—most frequently in the military press—to the threat of a US surprise attack. In contrast to US practice, none of the Soviet bomber force has been kept on alert and only a few missile submarines are within range of targets on the US mainland at any time. Some 60 to 70 percent of all operational Y-class submarines are normally in two ports, and nearly all of the heavy bombers and tankers are usually at their five home bases, making both of these forces highly vulnerable to a surprise nuclear attack. We do not know how much of the ICBM force deployed in silos is at full alert, i.e., with the gyroscopes of the missile guidance platforms constantly running. If the gyroscopes are not in constant operation, the Soviets would have to allow about 20-25 minutes for them to stabilize after actuation before missiles could be fired.

142. The principal explanation for this low level of readiness probably lies in the long-standing Soviet belief that hostilities with the US and its allies would come about only in the course of a major political crisis, which would provide opportunity for bringing Soviet forces to peak readiness. There is no evidence that during such crises as the 1962 Cuban missile episode, the 1967 Arab-Israeli war, and the invasion of Czechoslovakia in 1968, the Soviets placed their strategic forces in peak readiness. This may have reflected concern on the part of Soviet leaders that the US would detect such measures and mistakenly interpret them as a sign of intent to attack, or their fears of accidental or unauthorized use. It seems more likely, however, that the Soviet leadership did not consider that the situations cited had become sufficiently grave to warrant such an action.

143. There is evidence that Soviet military leaders, for their part, would favor pre-emption—that is, beating the other side to the draw—in the event that a crisis proceeded to a point where full-scale nuclear war appeared both imminent and unavoidable. As early as 1961, when Soviet forces for intercontinental attack were few in number and highly vulnerable to a US first strike, the late Defense Minister Malinovskiy asserted that the way to forestall an enemy surprise attack was to "promptly deal him a crushing blow". The same theme was recently restated by Defense Minister Grechko who wrote that combat readiness requires, among other things, "the knowledge of how to discern in good time the possible intentions of the enemy and to deal him a crushing blow". This concept has also been explored in Soviet classified military writings. An article in 1962, for example, called for "seizing and retaining the initiative" in modern warfare and stated that "nuclear bursts on enemy territory (should) take place simultaneously with, or even before, his strikes on our installations". Pre-emption is likely to remain a dominant theme for some years in Soviet military thinking.

144. Soviet military writers have also considered the concept of launch-on-warning—that is, on receipt of warning that an enemy strategic attack is under way. In the spectrum of risks, launch-on-warning represents a kind of halfway point between pre-emption, which accepts responsibility for the initiation of hostilities in order to maximize one's own offensive effort, and pure retaliation, which accepts some loss of retaliatory capability in order to avoid possible miscalculation. Veiled references to launch-on-warning have appeared in Soviet writings since the early 1960s, and these formulations have gradually become more specific. For example, the third (1968) edition of Marshal Sokolovskiy's authoritative *Military Strategy* states that "present means of

reconnaissance . . . can opportunely disclose a significant portion of the measures of direct preparation for a nuclear attack by the enemy and in the very first minutes locate the mass launch of missiles and the take-off of aircraft . . . and, at the right time, warn the political leadership of the country about the impending danger. Thus, possibilities exist not to allow a surprise attack by an aggressor and to deliver nuclear strikes on him at the right time." [26] On two recent occasions well-connected Soviet scholars [redacted] have asserted that present Soviet strategy calls for launch-on-warning.

145. It is doubtful, however, that either pre-emption or launch-on-warning would be all that simple. In view of the immense risks involved, the political leaders who would have final authority over the Soviet use of nuclear weapons would probably not be easy to convince that the US was about to strike and that, therefore, the time for pre-emption had come. They would probably believe that the US would also continue to have strong inhibitions against starting a nuclear war and that even in a particularly grave crisis a political solution should be possible. In the case of launch-on-warning they would have to gamble everything on the accuracy of whatever information they were able to obtain about the US attack. The Soviets themselves have emphasized some of the dangers inherent in such a policy in an article in an open Soviet publication in October 1970 which said that launching an "automatic instantaneous counterattack" upon detecting the launch of enemy missiles would increase the likelihood of a catastrophe and turn "the gloomiest of the prophesies of military science fiction into sinister reality".

[26] The editor of all three editions informed the US Defense attache in April 1971 that *Military Strategy* still represents basic Soviet thinking.

Targeting

146. There are numerous references over the years to indicate that the primary mission of Soviet strategic attack forces remains the classic one of destroying the enemy's war-making capability. The evidence would indicate that once deterrence had failed or was thought to have failed, the paramount concern of the Soviet military leadership would be with how to win the war, or at the least with how to maximize the chances of the USSR's surviving it as a nation. Thus, the basic and overriding objective of Soviet targeting for strategic forces would be to reduce the enemy's ability to carry on the battle through attacks on his military forces and installations, on command and control facilities, and on military industry.

147. An early indication of this targeting philosophy was contained in a classified article published in an authoritative journal of the SRF in 1961. This article identified the basic targets of an MRBM regiment as strategic missile launch sites, nuclear weapons production and storage facilities, military-industrial and government centers, and various major military installations. In 1967, a description of a strategic exchange scenario in the classified theoretical journal *Military Thought* again stressed the importance of destroying systems for supporting and controlling strategic forces—a theme echoed in a public statement by Marshal Krylov, chief of the SRF, asserting that the targets for his forces included the enemy's means of strategic nuclear attack.

148. Lists of target categories which emphasize destruction of the enemy's military forces and military-economic potential are contained in successive editions of Marshal Sokolovskiy's authoritative *Military Strategy*.

Analysis of Soviet SAM deployments up to the present indicates that the USSR has evidently decided to use similar priorities in its own defenses, protecting military installations, military industry, and basic military and civil administrative control centers rather than population or industry *per se;* some sizable population centers without such installations have been left undefended. ICBMs are also undefended by SAMs, but presumably on the ground that bombers, even from forward bases, could not provide a timely threat to their survival.

149. These considerations lead us to believe that the Soviet target list for an ICBM attack on the US would emphasize strategic military installations—SAC bases, ICBM launch control facilities or launchers, Polaris submarine bases, command posts, communications and power facilities, and industrial centers—though probably not in the same proportion under all circumstances. In a preemptive attack, certain time-urgent targets such as missile warning radars and bomber bases might be targeted more heavily than in a retaliatory strike, but in the latter case as well the Soviets would probably seek to ensure that no further US strikes were possible. In any event, it appears unlikely that the Soviet objective would be to annihilate the population as such, even in a retaliatory strike. The Soviets certainly recognize, however, that a large percentage of the US population would still inevitably come under Soviet attack in an all-out nuclear exchange in view of the location of important strategic military targets in or near virtually every large US city.

150. It is not clear what degree of freedom the Soviets would have in planning a strike, nor whether their choice would be limited to preprogrammed attack plans. That some flexibility in targeting strategic nuclear weapons exists is indicated by the observed ability to fire ICBMs on different azimuths and to different ranges. Flexibility is also suggested by the need to deal with both pre-emptive and retaliatory attacks against the US, against Europe, or against China, and the need to adjust to changes in the number and location of targets over time. We do not know how many targets each Soviet ICBM is capable of covering without reprogramming but we think it likely that it is more than one.

IX. DECISION-MAKING IN THE USSR

151. We have little basis for estimating the content of specific decisions on weapon programs, now or in the future. We lack clearcut evidence even on present force goals. Our ability to assess the future is severely limited by the secrecy of the Soviet decision-making process, and by a lack of evidence about the positions taken by key individuals and organizations, and the extent to which these positions are taken into account. It is difficult, moreover, to draw analogies between the interplay of political forces within the Soviet system and within Western societies.

152. We do know, however, that certain distinctive features of the Soviet system affect the way in which decisions are made, almost certainly including decisions on military forces. The principle of close and relatively detailed party supervision of military affairs, in peace and in war, is well established in the USSR, partly as a consequence of the Party's persistent fear of Bonapartism. From the earliest days of the Soviet state, the primacy of the party has been stressed, particularly the primacy of its central organs. The military has been drawn deeply into the party system in a number of ways, as a means to insure its fidelity. Finally, more decisions are made by the top political leadership in the USSR than in the US or other Western countries, partly because of the general tendency of the Soviet bureaucracy to push decisions toward the top.

153. Given this kind of system, it is tempting to conclude that all major decisions on military policy must necessarily be made at the top. It is only another step to conclude that under the circumstances, decisions can be and are in fact made in the light of a carefully thought out strategy or rationale which is undeviatingly executed by subordinates. It then follows that observed military programs both reflect and reveal this rationale.

154. Though the above view may fit the Soviet Union in principle, there is good reason to believe that it is simplistic and misleading. For one thing, the very size of the USSR renders it impossible for the center to make all the important decisions. For another, any society has clusters of interests and power at and below the center, which have more or less distinctive goals of their own. In some degree at least, these goals inevitably differ from one another. In his later years, Stalin came close to bringing all other interests under his personal sway, but those who followed him have been both less willing and less able to do this.

155. The change resulted not only from the departure of a uniquely potent and prestigious figure, but also from the growing complexity of the decisions to be made and the impossibility of acquiring all the information necessary to make them. In the case of military programs, the members of the Politburo appear to call on the military to formulate requirements and recommendations. While they have machinery for screening and evaluating such recommendations, they evidently do not have a well established body of independent experts in a position to supply critiques. Thus, they are likely to be heavily dependent on the technical judgments of their military advisers. The military comprise a discrete institution and they are given ample opportunity to counsel the political leadership. They do not constitute a disaffected element and they do not perceive of the nation's future in terms which are basically at odds with the concepts of the Party. But they do constitute an interest group which must contend with other such groups. The present political leaders, unlike Khrushchev, have preferred to avoid direct conflict with the military in the area of the latter's professional competence. Khrushchev himself said that it took every bit of his power, and certain sops as well, to push through the large cut in military personnel which took place in the late 1950s.

156. The highest level body which joins party, government, and military interests is a group known as the Defense Council. Its permanent members include General Secretary Brezhnev as Chairman, Premier Kosygin, Defense Minister Grechko, Supreme Soviet President Podgorny, and possibly others such as Party Secretary Ustinov, who serves, in effect, as Brezhnev's deputy for military industrial affairs and who, among other things, oversees the activities of the Military Industrial Commission (VPK). Others may attend particular discussions. The Council apparently is a deliberative body charged, in peacetime, with providing recommendations to the Politburo on national security matters. A recommendation unanimously advanced by the Council to the Politburo for final consideration would probably encounter little, if any, opposition. The resolution of contentious and undecided issues would be achieved within the Politburo.

157. The military services dominate the Ministry of Defense (MOD), and the top positions are held by professional military officers. The MOD is unlike a Ministry of Defense in the Western sense; it has few civilians and is essentially a General Staff; in this role it has considerable autonomy. It seems to be highly compartmentalized, both within itself and vis-à-vis outside organizations.

158. The military leadership is not, of course, always of one mind. There is ample evidence of rivalries in the past—these became acute, for example, when Khrushchev was trying to build up the SRF at the expense of the general purpose forces, but they have been evident on other occasions and over other issues as well. These conflicts almost certainly continue, although they appear to have become muted. The combined arms tradition is strong, and since the time of Khrushchev, the services appear to have been generally successful in composing their differences and presenting a united front. Part of the reason, perhaps, is that under the collective leadership the total military budget has been slowly but steadily increasing, which may have made the competition for resources within the military less keen than if the budget were constant or diminishing. The estimated shares spent for the individual services appear, in recent years, to have been remarkably steady.

159. The proposals to the Politburo emanating from the MOD are likely to be conservative in approach, emphasizing continuity rather than change. The military establishment is still largely headed by men who won their reputations in World War II and who probably acquired many of their basic concepts at that time. This is not to say, however, that these men are entirely resistant to innovation. Many of them appreciate the importance of a strong R&D effort. Furthermore, just below the rapidly thinning line of World War II leaders is an ever-growing number of younger, more technically oriented comers.

160. With respect to the defense industries, we are uncertain about how extensive a role they play in the decision-making process. The ministries responsible for producing military hardware are major claimants to scarce resources. Their favored position in the Soviet economy should provide them with a strong lever for influencing decisions. In general, the party meddles less with military production than it does with other forms of economic activity, and there is a much closer relationship between producer and user—in this case the military—than is true elsewhere in the economy.

161. The eight ministries primarily responsible for defense industry are represented on the VPK. Little is known about this superministerial body, which is officially subordinated to the Council of Ministers but has direct links with the Secretariat of the Central Committee as well. In addition to its obvious role of providing a forum for the discussion of problems and programs, it apparently exercises some kind of supervisory role in the coordination of defense production. The defense industries have, in the broadest sense, common interests and objectives, and the VPK is thus likely to behave, on occasion, as a sort of defense industry lobby. On other occasions, however, it probably behaves more like an uneasy coalition of members serving their own interests.

162. The scientific and technical elements in the defense establishment appear to have less leeway for innovation than their Western counterparts. Indications at SALT and elsewhere are that scientists and technicians tend to be regarded more as skilled aids rather than as partners of the military. By and large, they are apparently told only enough about the task at hand to handle the requirements explicitly levied upon them. We have evidence, however, that the major planning and coordinating agency for R&D, the State Committee for Science and Technology, lays before the Council of Ministers a series of goals covering practically all fields of science, presumably including those related to the military, and all of the economy.

163. Moreover, the influence of scientists and technicians is almost certainly felt in other ways, which are important if indirect. For one thing, Soviet military and political leaders

have their options at least partially defined for them by those responsible for R&D. To put it another way, new technology, and thus the nature of the weapon systems developed, is probably influenced as much from below as from above. To the extent that this is so, the result would not be a response to some grand design, but a reflection of the interests of individual services, particular design bureaus, and the like.

164. Broadly speaking, a trademark of Soviet weapons R&D is "straight line" improvement—most frequently, design concepts do not anticipate the state-of-the-art. The history of various Soviet strategic missile programs provides some evidence of the continuity of scientific and organizational influence on a major category of weapon systems. The SS-9, for example, can be viewed as a larger and better SS-7, which in turn is a "product improvement" on the SS-5 IRBM. These three systems were apparently all designed at the Dnepropetrovsk missile development center by the same team. Similarly, but perhaps less clearly, the SS-8 can be viewed as a descendant of the SS-6, and both were apparently designed by the same team.

165. Other individuals and groups also play a role in the decision-making on military matters, but we do not know in detail how they operate, or their exact relationship to the top political and military leadership. Three departments of the Central Committee Secretariat deal with political, personnel, and materiel affairs; the latter is handled by the Defense Industries Department. We have evidence that studies and testimony by such officials as Yuriy Arbatov, head of the Institute of the USA in the Academy of Sciences, have been used by members of the Defense Council. The top State economic planning organization, Gosplan, coordinates and integrates the national R&D program, including the military R&D program.

166. The preceding discussion provides an incomplete picture of the way in which decisions about military forces are made. There is a great deal that we do not know or do not know in detail, most notably where particular decisions are made and by whom, and what weight particular persons or institutions carry in the process. Nonetheless, an outline emerges which permits the following tentative conclusions:

a. It appears that the Soviet decision-making process involves clusters of advisory and executive bodies, which are likely at times to be in competition with one another. These clusters funnel their views to the top leadership, political and military, in a number of ways.

b. Brezhnev and his colleagues on the Politburo and the Defense Council work in a context of bureaucratic pressures, conflicts, and constraints, which may be heavy at times, and which serve, in practice, to check and balance the power of the top political and military leadership.

c. In the case of military programs, the decision-making process is probably centered on two key elements—the military and military-industrial authorities who formulate and propose new programs and the top political leaders, particularly those who serve on both the Politburo and the Defense Council. Other individuals and interest groups play a role, but almost certainly a lesser one.

d. Despite the institutional and political power of the military, the scientific establishment, defense industry, and other groups which may be involved, the political leadership clearly has the final say. Just as clearly, however, it must operate in the context of other forces, and take them into account, if only by a conscious rejection of what they advise.

e. One consequence of the process seems to be a conservatism both in proposing and in disposing. Specifically, in the areas of weapons development and procurement, new solutions seem to be offered in the context of proven approaches, rather than by constantly pushing the state-of-the-art.

X. ILLUSTRATIVE FUTURE FORCES [27]

Introduction

167. We believe that the Soviet political leadership looks upon most aspects of the USSR's present strategic position with considerable satisfaction. The Soviets now have overtaken and surpassed the US in numbers of ICBMs, are in the process of at least matching the US in SLBMs, and have won clear recognition, both in SALT and in world opinion, as the strategic equal of the US. Advances in the size, makeup and breadth of operations of the Soviet Navy have further strengthened the Soviet claim to equal treatment with the US as a world power. Although China's nuclear programs pose a long-term threat, Soviet military preponderance over China appears assured for many years to come.

168. Present Soviet thinking about the limitation of strategic weapons is probably based on the belief that at least a limited first-stage agreement can and should be achieved in SALT in the near future. This is certainly the implication of Soviet participation in the joint announcement of 20 May 1971, and of subsequent Soviet efforts to push ahead with the negotiations. To be sure, the Soviets have clearly shown far more interest in an agreement limiting ABM deployment than in limitation of offensive systems. They must clearly reckon, however, with the official US position that offensive limitations must form an essential part of the bargain, and are probably prepared to provide a *quid pro quo* in this area.

169. Soviet leaders probably see a number of potential advantages in stabilizing the strategic military aspect of their continuing world-wide rivalry with the US. In view of the vast strategic resources now in place on both sides and US sensitivity to Soviet force developments, they may doubt their ability to improve their relative position; indeed, they may have some fear of losing ground in any all-out competition. Although military requirements still enjoy top priority and will presumably continue to do so, there have been repeated indications of a desire to reduce the burden of military expenditures if this can be done without prejudice to the USSR's insistence on full strategic equality with the US. The Soviets probably also believe that completion of a strategic arms limitation agreement would reinforce US inhibitions against using or threatening the use of nu-

---

[27] Maj. Gen. Rockly Triantafellu, the Assistant Chief of Staff, Intelligence, USAF, dissents to part X and its Appendix. He believes that the illustrative force models do not adequately address The Problem stated on page 1 to estimate the size and composition of Soviet forces through mid-1976 and to forecast general trends thereafter.

He agrees that these illustrative forces are not suitable for use in military planning. In his view, the lack of a specific estimate limits the utility of the document and at the same time provides too much latitude for misinterpretation of the data.

New Soviet ICBM silo construction programs, the expansion of Soviet submarine production, and the development of the Backfire indicate to him a Soviet intent to achieve both qualitative and quantitative increases to their strategic weapon forces.

Further noting the Soviet requirement to build strategic forces suitable for operations against the US, NATO Europe, and China, and the historical Soviet penchant for large inventories, he would estimate under a SALT agreement that the Soviets are not likely to accept strategic forces for intercontinental attack that are fewer than those they now have in being or undergoing deployment. Moreover, he believes that the likely Soviet course of action in the absence of a SALT agreement would be a level of effort greater than those represented in the Force 2 group.

clear weapons—a goal of Soviet policy ever since the ban-the-bomb campaigns of the early 1950s.

170. We still have no good basis for judging, however, how firm a consensus in favor of an agreement exists in Moscow and whether that consensus is based on terms which would also be acceptable to Washington. Soviet SALT representatives have indicated that the top political and military leaders in the USSR are now directly concerned with SALT matters, and it has been asserted that the military, as well as the political leaders, favor an agreement in principle. Individual Soviet SALT representatives, however, have also said a number of things indicating that some elements in Moscow remain highly suspicious of the US and skeptical about an agreement, and that much difficulty had been encountered in hammering out the Soviet negotiating position.

171. To some extent, such remarks probably represent a negotiating tactic, designed to encourage the US to be more forthcoming. Our best judgment, however, is that some such reservations, particularly among but not limited to the military, do exist. Nonetheless, we believe that the dominant element in the leadership is presently willing to settle for "equal security with no military advantage to either side"—to use an expression used frequently in SALT by the Russians.[28] Much depends on one's definition of "equal security", however. There are certainly powerful elements, moreover, whose instinct is to press ahead with the expansion of Soviet forces in an effort to secure some advantage, because they are not satisfied with parity, or simply because they believe that more is better than less. Some sort of understanding has probably been struck in Moscow on how much leeway for development and deployment of improved weapon systems the Soviet military will have if an arms limitation agreement is reached. A breakdown of, or prolonged delays in, negotiations, in turn, would probably lead to renewed internal debate as to how the USSR should proceed with its strategic programs.

172. We have attempted to reflect these considerations, and the various uncertainties, in this Section. It contains a series of projections illustrating the range of choices available to Soviet decision-makers, taking into account their probable assessment of the threat posed by US forces, the type of Soviet weapons likely to be available, and possible Soviet requirements and goals.

173. A great variety of intercontinental attack forces can reasonably be postulated for the Soviets in the 1970s. We think that some limits can be set in terms of technological development, deployment capability, and availability of resources. These limits are by no means hard and fast, however. And within the limits there are many options, greatly influenced by other factors which impact on Soviet strategic policy such as the Soviet perception of the threat. Moreover, force development is an incremental process, worked out year by year as the choices and requirements change in the eyes of Soviet planners. Future forces that appear appropriate to the Soviets this year may look different next year, and decisions about forces will almost certainly

[28] Maj. Gen. Rockly Triantafellu, the Assistant Chief of Staff, Intelligence, USAF, does not agree with this judgment. He believes Soviet aims are to forestall increases in US strategic forces particularly while the Soviets are occupied with the Chinese problem. If the Soviet leadership were in fact endeavoring to "settle for equal security" there would be some evidence of leveling off or reduction in their defense efforts instead of continuing extensive Soviet military developments in deployments as are now being seen.

change many times during the period of this estimate.

174. The illustrative projections of Soviet intercontinental attack forces in this Section are based on our estimate of possible force developments under various conditions as now viewed by Soviet military planners. The Soviet planner would probably utilize his perception of the threat posed by US strategic forces and the present and projected state of Soviet weapons technology and deployment as basic inputs, operating within the context of formal policy guidance on strategic objectives—including any arms limitation agreement—and of funds available for weapons development and deployment. The remainder of this Section utilizes what we know or can assume or postulate about these factors to describe a set of illustrative Soviet forces.

The Soviet Perception of the US Strategic Threat

175. The Soviets have accurate information on the deployment of current US strategic forces and a good understanding of their technical characteristics, such as yield and accuracy. They are also well aware of some of the latest technical developments in weaponry and of deployment programs proposed for the 1970s.

176. We do not know exactly how the Soviets would project the threat from US strategic forces during the 1970s. They know from past experience that not all proposed weapon programs are adopted, but they probably make generous assumptions about US capabilities, partially to be on the safe side and partially because they view the US as dominated by a "military-industrial complex". Moreover, they have seen the US deploy advanced weapon systems relatively quickly. They probably think in terms of a range of possible US strategic forces, particularly for the period beyond the next few years.

177. The Soviets probably judge that present US forces and the presently programmed additions and improvements represent the likely US force posture for the next few years, say into the mid-1970s. For the period after this they are likely to view US programmed forces as a minimum US force posture and would probably allow for new systems and improved technical characteristics to programmed forces to cover a range of plausible US threats. The range of possibilities might look like this to the Soviets:

MAJOR CHANGES INCLUDED IN PROGRAMMED FORCES	MAJOR CHANGES INCLUDED IN AUGMENTED I	MAJOR CHANGES INCLUDED IN AUGMENTED II
Minuteman III retrofitted to about half of the force.	Minuteman III retrofitted to entire force.	Minuteman III retrofitted to entire force.
Poseidon missile retrofitted to 31 SSBNs.	Poseidon missile retrofitted to 31 SSBNs.	Poseidon missile retrofitted to 31 SSBNs. Begin deployment of ULMS.
Some reduction in B-52s; begin deployment of B-1 to replace some of the older B-52s.	Additional deployment of B-1; smaller reduction in B-52 force.	Maintain all B-52s. Still more deployment of B-1s.
Safeguard deployment for four Minuteman complexes.	Twelve Safeguard sites.	Sixteen Safeguard sites.

178. If the Soviets view possible US force postures along these lines, there are three important features they would have to consider in planning their own forces:

a. All three postulated forces contain large numbers of accurate MIRVs by about 1975. As a "worst case", the Soviets probably would assume that the MIRVs would have yields and accuracies sufficient to threaten a significant part of their existing ICBM force.

b. Two-thirds or more of the missile RVs would be carried on submarines, which would be highly survivable when deployed.

c. The two augmented US forces would, in the late 1970s, include large numbers of ABMs which the Soviets might wish to counter with multiple RVs or penetration aids.

179. The postulated US forces outlined above do not reflect all of the qualitative improvements which could be made to these forces. Soviet force planning will certainly take account of US plans to harden some or all of the Minuteman silos, to improve yields and accuracies of missile RVs, and to introduce new bomber weapons such as the short-range attack missile (SRAM) and the subsonic cruise armed decoy (SCAD).

180. We do not know what estimate the Soviets might make of the probability that the US would deploy either of the augmented forces. For the mid- and late-1970s they might assume a level of effort something like the postulated US Augmented Force I, and they might look upon something like the Augmented Force II as a "worst case" possibility.

181. The possible range of US force postures within the constraints of an arms limitation agreement would depend, of course, on the actual terms of the agreement. Present indications are that such an agreement, at least initially, would sharply restrict ABM deployment on both sides, thus easing the requirement for enhanced penetration, but would place little if any restraint on the MIRV and silo hardening programs. Thus, as the Soviets might view them, US strategic attack forces could develop along the lines of programmed forces even *within* the constraints of an agreement, and further qualitative improvements, such as higher yields and better accuracies, could be made to existing systems.

System Characteristics and Deployment Options

182. This Section presents the basic assumptions about Soviet strategic attack systems that underlie our projections of future Soviet forces. It briefly reiterates our estimates of the structure of present forces—such as the number of each SS-9 Mod deployed—and the prospects for each weapon system, such as the deployment of MIRVs. Some of the assumptions differ for various projected forces and those differences are spelled out here and in the discussion of each projected force.

Intercontinental Ballistic Missiles

SS-7 and SS-8

183. These systems are old, entail high operating costs, and are relatively vulnerable, and the Soviets will probably retire them in due course. We assume that all SS-7 and SS-8 launchers will be deactivated by the end of the decade, except in the two SALT cases and in Force 4 which illustrates an all-out Soviet effort.

SS-9

184. We postulate that the current SS-9 force of 276 operational missiles consists of 48 Mod 1s, 180 Mod 2s, 18 Mod 3s, and 30

Mod 4s.[29] For the reasons stated in Section II, paragraph 39, page 26, we have limited deployment of the Mod 3 to three launch groups in all the illustrative forces. We do not postulate additional deployment of the SS-9 beyond the 12 launchers now under construction, and we assume that the Mod 2 will be deployed in these 12 silos.

New Large Missile

185. We postulate that a new missile will be developed for some of the new silos. Based on a two-year flight test program, this new missile would be ready for deployment in late 1973 if testing started soon. Accordingly, the first time the new missile appears at mid-year in the illustrative force tables is 1974. Using past SS-9 deployment patterns as a guide, we have postulated that the Soviets could build additional new large silos at rates of up to about 50 silo starts a year. In addition, we assume that the new missile could be utilized in standard SS-9 silos after modifications to the silo.

186. We assume that the new large missile will have throw weight capabilities similar to the SS-9. As stated in Section V, paragraph 93, our best judgment is that it will carry MIRVs. Accordingly, three of the four different payloads we have postulated for this missile are MIRV systems.

187. We do not know what characteristics the first Soviet MIRV system will have, notably the number of RVs and their accuracy. A new large missile with payload capabilities similar to the SS-9 could have as few as three RVs, but six RVs [ ] would probably fit as well. Moreover, it should be no more difficult technologically to develop a system with six RVs than one with three.

[29] For differing views on whether the Mod 4 is in fact presently deployed see Section II, paragraph 52.

188. We noted earlier that the Soviets probably could achieve accuracies on the order of 0.25 n.m. CEP with improvements to present guidance systems. A flight test program to improve accuracy probably would take about two years to complete but could be included in the test program for the new large missile.

189. To take account of the possibility that the new missile will not carry a MIRV payload, we have also postulated a single RV payload for this missile. In this case, we assume an accuracy similar to that of the present SS-9 system.

190. The four alternative payloads we have postulated for the new missile are:

— A 3-MIRV payload with an accuracy of about 0.5 n.m. CEP;

— A 3-MIRV payload with an accuracy of about 0.25 n.m. CEP;

— A 6-MIRV payload with an accuracy of about 0.25 n.m. CEP;

— A single RV payload with an accuracy of about 0.5 n.m. CEP and which also carries exo- and endo-atmospheric decoys.

191. The type of payload included in any one of the illustrative forces follows from the assumptions we make regarding Soviet objectives and their rate of progress in R&D. The new single RV payload is postulated in the lower limiting force and in Force 2C, which assume that MIRVs will not be deployed prior to 1975. We have postulated 3-MIRV systems for those remaining forces (SALT Force 1 and Forces 2A and 2B) which emphasize a retaliatory capability. The accurate 6-MIRV payload for the new large missile with an early IOC date is postulated for SALT Force 2, and for Forces 3 and 4, which place heavy emphasis on a counterforce capability.

192. We assume that if the first MIRV system deployed does not have an improvement in accuracy over the current SS-9, then one with improved accuracy, on the order of 0.25 n.m. CEP, would be introduced after 1975.

193. The Soviets could probably develop a MIRV payload with more than 6 RVs, say about 12 RVs, on a large missile by 1975. A 12-MIRV system [ ] would offer advantages in terms of targeting flexibility and assured destruction. We have not included it in the illustrative forces, however, because it does not have better hard target capabilities than the postulated 6-MIRV system and because [ ]

SS-11

194. We assume no further deployment of standard SS-11 silos. We also assume that all presently operational SS-11s are equipped with the Mod 1, but that both versions of the SS-11 Mod 2 will be operational by the end of 1971. We have included the Mod 2 in all of the projected forces, although we do not attempt to decide what the mix will be between the Type A and Type B. The number of SS-11 Mod 2s postulated in each of the illustrative forces is based on the level of assumed US ABM deployment.

New Small Missile

195. We assume that an existing variant of the SS-11 will be deployed in some of the new silos and that a new missile will be retrofitted into these silos when it becomes available. Flight testing of a new missile could begin by the end of the year. Based on a two-year flight test program, the missile could reach IOC by late 1973.

196. If, in fact, a new small missile is developed, we assume it would have throw weight capabilities similar to the SS-11. We would expect it to incorporate improvements, such as better accuracy or more RVs. We have postulated four different payloads for such a new small missile in the illustrative forces. They are:

— A single RV system carrying penetration aids and having an accuracy of about 0.6 n.m. CEP;

— A single-RV system carrying penetration aids and having an accuracy of 0.25 n.m. CEP;

— A 3-MIRV system having an accuracy of about 0.6 n.m. CEP;

— A 3-MIRV system having an accuracy of about 0.25 n.m. CEP.

197. The new single RV payload with an accuracy of 0.6 n.m. CEP is included in Force 2C, which assumes that there will be no MIRV deployment until 1976 and that the Soviets deploy additional launchers instead. The accurate (0.25 n.m. CEP) single RV payload is postulated in Force 3, which is designed to counter Minuteman. The accurate 3-MIRV system is postulated in SALT Force 2 and in Forces 2A and 4, which assume rapid technological advance. The less accurate MIRV payload is included in the other forces.

Launchers at Derazhnya and Pervomaysk [30]

198. In the case of the SALT forces laid out below, the 120 SS-11 launchers at Dera-

[30] Dr. Ray S. Cline, the Director of Intelligence and Research, Department of State, believes that the 120 SS-11s deployed at Derazhnya and Pervomaysk should be included in all the illustrative future force tables in NIE 11-8-71. These launchers could be targeted against the US in the future, even if one believes that their primary mission *at present* is for peripheral attack.

zhnya and Pervomaysk are included in the tables, because they would be subject to the restrictions of an agreement. As was the case last year, we do not include them in our other tables, in view of the differences of opinion as to whether they have a primary role in peripheral or intercontinental attack.[31] To the extent that these launchers are or will become available for use against the US, they should be considered additive to the other illustrative forces.

SS-13 Variants

199. In light of the limited deployment given the SS-13 to date and our present lack of information as to the advantages of the SS-13 Mod 2 over the Mod 1, we have assumed no further deployment of this system and have made no assumptions regarding the pace and extent, if any, of the replacement of the Mod 1 by the Mod 2.

Mobile Systems

200. As indicated in Section V, paragraph 85, there is no firm evidence that the Soviets presently intend to develop mobile ICBM systems. The only mobile missile program which may have had an ICBM application, the SS-X-15, apparently has been cancelled. We, therefore, have projected deployment of mobile ICBMs only in the high side force which illustrates an all-out Soviet effort. We postulate that a land-mobile ICBM would not reach IOC until 1975 at the earliest and that it would have payload capabilities equivalent to those of the SS-13.

[31] Maj. Gen. Philip B. Davidson, the Assistant Chief of Staff for Intelligence, Department of the Army; Rear Adm. Earl F. Rectanus, the Director of Naval Intelligence, Department of the Navy; and Maj. Gen. Rockly Triantafellu, the Assistant Chief of Staff, Intelligence, USAF, would include the SS-11 launchers at Derazhnya and Pervomaysk in all tables because they consider those launchers to be primarily for use against the US.

Submarine Launched Ballistic Missiles

201. It is estimated that one H-class submarine has been modified to carry the SS-NX-8. Since the other eight have only recently been through one modification program, they probably would not undergo another. In any case, nine H-class submarines would not provide the Soviets with the number of longer range SLBMs which we think they would want to have. Accordingly, we have postulated two ways of meeting such a requirement:

— One alternative assumes that the Soviets develop an entirely new missile with a range of 2,000 n.m. or more and which is compatible with the Y-class submarine. The missile would reach IOC in 1975. This alternative assumes that the Y-class force level lies between 40 and 60 submarines.

— The other alternative assumes that a new class of SSBNs will be built to carry the SS-NX-8. The new SSBN would become operational about 1975. Y-class construction would end when about 40 had been completed, but in all but Force 1, the Y-class would be retrofitted beginning in 1978 with an entirely new missile with a range of 2,000 n.m.

We have postulated a 3-MIRV payload for the new missile and for the SS-NX-8 in some of the Forces, beginning as early as the mid-1970s.

202. For all of the illustrative forces, we have assumed that the H-II class submarines are transferred from the intercontinental attack role to the peripheral attack role by the mid-1970s. The single H-III is carried in the intercontinental attack role throughout the period in all cases. Diesel-powered G-I-class sub-

marines are not included in the projections, on the grounds that they probably are now intended primarily for peripheral attack. Some G-II class submarines are included in the projections until the mid-1970s by which time it is postulated that they will all be transferred to a peripheral role.

Bombers

203. The Backfire appears best suited to a peripheral role and is included in NIE 11-14-71.[32] We have included it in most of the illustrative force tables because of the possibility that some portion of the force (perhaps in an improved version) might be used for intercontinental missions.

204. We have postulated that the Backfire would begin to enter operational units in late 1973, the earliest date at which it would enter the force using current weapon systems. A reasonable annual production rate would provide about 15 aircraft by mid-1974, 30 aircraft the following year, and 35 a year thereafter, giving a force of 150 in 1978. A high priority program could provide 50 aircraft a year, resulting in a force of 250 in 1979.

205. We have postulated rates of attrition for older Soviet heavy bomber aircraft ranging from a reduction of the force to less than half its present size by the late 1970s, to maintenance of nearly the entire force.

Alternative Force Developments

206. The alternative force developments presented in this section represent possible directions that Soviet strategic policy could take. Many other models could be postulated and for any one model illustrating a particular force planning philosophy and level of weapons technology, many other force levels could be projected in general or in detail. Nevertheless, we believe the models chosen are representative of the range of possible Soviet courses of action. It should be emphasized, however, that we consider no one of them an estimate that Soviet intercontinental attack forces will be composed of the particular weapon systems in the precise numbers listed. They are intended to be illustrative of possible trends and differing emphases, and as such are not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

207. In the following discussion, the summary tables show the status of the various postulated forces as of mid-1976. The year 1976 represents the end of the near-term period of about five years for which we are able to project with some confidence. In modeling these forces, however, we have further extended the projections to 1979 and have briefly summarized these extended projections and their rationales in the text.[33] By extending the projections for these three additional years, we are able to depict more clearly the trends effected by major qualitative improvements—accurate MIRVs and follow-on SLBMs for example—which do not enter service until the mid-1970s and are not available in significant numbers until the late 1970s.

Possible Forces Under A Strategic Arms Limitation Agreement

208. SALT could have any of several possible outcomes with varying effects on Soviet forces. We assume for the purposes of our

[32] Maj. Gen. Rockly Triantafellu, the Assistant Chief of Staff, Intelligence, USAF, believes the Backfire when deployed will be suitable for both peripheral and intercontinental missions. For his reasons see his footnote in Section VII to paragraph 135.

[33] The Appendix to Section X contains tables giving numbers of delivery vehicles in each illustrative force at mid-year for the years 1971-1979.

projections that an agreement would contain provisions similar to the following:

ICBM launchers are limited to the number operational or under active construction as of 1 October 1971.

Existing silos may not be replaced with new silos and the internal diameter and the depth of existing ICBM silos may not be increased.

Silos for modern large ballistic missiles (MLBMs) [34] are limited to those externally complete by 31 December 1971.

Replacement of missiles is permitted as long as the limitation on MLBMs is not exceeded.

Construction starts of new ballistic missile submarines are prohibited as of 1 October 1971.

Conversion of ballistic missile submarines to carry additional SLBM launchers is prohibited.

Intercontinental bombers are not limited.

ABMs are limited to a few hundred launchers.

There would be no limit on R&D, on deployment of MIRVs, or on improvement in accuracy.

209. We have projected two forces to illustrate: (a) a likely and (b) a maximum Soviet effort within the type of SALT agreement postulated.

Strategic Arms Limitation Talks Force 1: Maintenance of Parity Under An Arms Limitation Agreement

210. This force illustrates the kind of intercontinental attack capability that the Soviets could achieve during the 1970s within the constraints of an arms limitation agreement similar to the one outlined above. The force is based on the assumption that the primary Soviet objective would be to maintain a strong retaliatory capability throughout the decade against the US programmed forces. We assume that the Soviets would be concerned primarily about the survivability of their strategic forces and consequently would improve the hardness of their ICBM force. To increase the number of targets they could attack and thus improve the retaliatory capability of their force, they would begin to deploy MIRVs as soon as possible.

211. It is possible that the progress of Soviet MIRV development will not be as rapid as reflected in the two illustrative forces under an arms limitation agreement, or that the Soviets may choose not to deploy MIRVs at all. The latter case appears to be much less likely. In either case, we would still expect them to move ahead with the new silo programs to improve the survivability of their ICBM force.

212. SALT Force 1 assumes that the Soviets achieve an early IOC for MIRVs, but at first do not improve accuracy over that of present missile systems. A missile with a 3-MIRV payload is deployed in SS-9 silos which are reconstructed to a new harder configuration. More accurate MIRVs are introduced later in the decade. Y-class SSBNs would be limited to 40 submarines. A new, longer range missile for the Y-class is introduced in the mid-1970s.

213. The SS-7 and SS-8 missiles are maintained throughout the decade, although it is recognized that under the postulated agreement the Soviets could replace them with missiles of less than 70 cubic meters in volume. SS-11s or a follow-on small missile would be deployed in the new silos at Pervomaysk and Derazhnya.

[34] Modern large ballistic missiles are defined as larger than 70 cubic meters in volume and which became operational after 1964. The SS-11 is 61 cubic meters, the SS-9 is 220 cubic meters.

ILLUSTRATIVE FORCE MODEL SALT 1
(Mid-1976)

	Delivery vehicles	Independently targeted re-entry vehicles
ICBMs	1,593	2,353
SS-7	190	190
SS-8	19	19
SS-9	108	108
Mod 2	(60)	(60)
Mod 3	(18)	(18)
Mod 4 (3-MRVs)	(30)	(30)
New Large Missile 3-MIRV, 0.5 n.m. CEP	180	540
SS-11 [a]	836	836
Mod 1	(620)	(620)
Mod 2	(216)	(216)
New Small Missile 3-MIRV, 0.6 n.m. CEP	200	600
SS-13	60	60
SLBMs	646	646
H-III/SS-NX-8	1/6	6
Y/SS-N-6	24/384	384
Y/New Missile, 0.25 n.m. CEP	16/256	256
Bombers	190	NA
Bear ASM Carrier	65	
Bear Bomber	15	
Bison Bomber	30	
Backfire [b]	80	
TOTAL	2,429	2,999

[a] Includes silos at Derazhnya and Pervomaysk.

[b] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

Strategic Arms Limitation Talks Force 2: Maximum Posture Under An Arms Limitation Agreement

214. SALT Force 2 illustrates a maximum Soviet effort within the constraints of the postulated arms limitation agreement. The force is designed to improve counterforce as well as retaliatory capabilities. It postulates rapid technological progress for all systems.

215. A strong counterforce capability is provided by the introduction in 1974 of an accurate 6-MIRV payload for a new large missile. Hardening the large silos and a 3-MIRV payload for both SS-11s and SLBMs would improve the retaliatory capability of the force. The SS-7s and SS-8s are maintained throughout the decade. Starting in 1974, bomber strength would be increased over current levels by deployment of Backfire at a faster rate than in SALT Force 1.

ILLUSTRATIVE FORCE MODEL SALT 2
(Mid-1976)

	Delivery vehicles	Independently targeted re-entry vehicles
ICBMs	1,593	3,153
SS-7	190	190
SS-8	19	19
SS-9	96	96
Mod 2	(48)	(48)
Mod 3	(18)	(18)
Mod 4 (3-MRVs)	(30)	(30)
New Large Missile 6-MIRV, 0.25 n.m. CEP	192	1,152
SS-11 [a]	736	736
Mod 1	(520)	(520)
Mod 2	(216)	(216)
New Small Missile 3-MIRV, 0.25 n.m. CEP	300	900
S-13	60	60
SLBMs	646	1,170
H-III/SS-NX-8/ 3-MIRV, 0.3 n.m. CEP	1/6	18
Y/SS-N-6	24/384	384
Y/New Missile 3-MIRV, 0.25 n.m. CEP	16/256	768
Bombers	235	NA
Bear ASM Carrier	70	
Bear Bomber	30	
Bison Bomber	35	
Backfire [b]	100	
TOTAL	2,474	4,323

[a] Includes silos at Derazhnya and Pervomaysk.

[b] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

Effect of Possible Variations in Terms of an Arms Limitation Agreement

216. The provisions of any agreement actually reached may differ in important respects from those postulated above. The agreement may be more generous and allow either side to construct additional SSBNs or be more restrictive and prohibit modernization of the ICBM force, even at existing launchers.

217. The Soviets might successfully press for more liberal provisions permitting completion of some of the new silos now under construction and additional SSBN construction. If so, in SALT Forces 1 and 2 we would project new SS-9 type missile deployment to a total of 313 launchers rather than the 288 shown. In the case of SSBNs, we would in SALT Force 1 include additional Y-class deployment or, alternatively, deployment of a new SSBN to carry the SS-NX-8. In SALT Force 2 we would include both these alternatives.

	SALT FORCE 1	
SLBM Alternative 1	1976	1979
Y-class/SS-N-6	34/544	10/160
Y-class/New Missile	16/256	24/384
Y-class/New Missile, 3-MIRV, 0.25 n.m. CEP	0	16/256
SLBM Alternative 2		
Y-class/SS-N-6	40/640	24/384
Y-class/New Missile, 3-MIRV, 0.25 n.m. CEP	0	16/256
New SSBN/SS-NX-8	8/128	10/160
New SSBN/SS-NX-8, 3-MIRV, 0.3 n.m. CEP	0	0
SLBM	SALT FORCE 2	
Y-class/SS-N-6	40/640	24/384
Y-class/New Missile, 3-MIRV, 0.25 n.m. CEP	0	16/256
New SSBN/SS-NX-8, 3-MIRV, 0.3 n.m. CEP	8/128	20/320

Likely Soviet Courses of Action under an Arms Limitation Agreement

218. If an actual agreement were along the lines of the one postulated above, we consider it unlikely that the Soviets would improve their force as rapidly as illustrated by SALT Force 2 except in response to improvements in US forces corresponding to the Soviet "worst case" threat estimate. The costs of SALT Force 2 would not be excessive compared to Soviet annual expenditures for intercontinental attack forces over the past several years, but the Soviets would probably estimate that their attempt to build SALT Force 2 would cause the US to accelerate its own programs for force improvements.

219. We believe SALT Force 1 is representative of a deliberate pace of force improvement that is within the terms of the assumed agreement and well within the capabilities of the Soviet R&D program. The force preserves strong retaliatory capabilities against likely US forces while reducing the costs of the intercontinental attack forces below recent levels of effort.

Possible Forces Without an Arms Limitation Agreement

220. The alternative force developments presented in this section represent possible directions that Soviet strategic policy could take in the absence of an arms limitation agreement. Our evidence provides little basis for a confident estimate of the size and composition of Soviet forces beyond the next few years. Accordingly, we present here not one but several examples of possible Soviet forces in the absence of an arms limitation agreement.

221. The first two cases presented are limiting cases—they are an attempt to establish the upper and lower limits within which Soviet forces are almost certain to fall. The

third case illustrates a set of forces within these two limits and the last case is an example of a force primarily designed to counter Minuteman.

Illustrative Force Model 1: Minimum Posture Without an Arms Limitation Agreement

222. Force 1 is illustrative of the results of a Soviet decision essentially to stay with what they have plus the minimum necessary to maintain a deterrent against US programmed forces. It is similar to Illustrative Force A in NIE 11-8-70 in that it includes comparatively little technical advance, deactivation of most of the older ICBM launchers, a halt in fixed ICBM deployment after current construction is complete, and modest force improvements intended only to ensure a retaliatory capability. Force 1 (as with Illustrative Force A in NIE 11-8-70) was deliberately designed to set forth a rough lower limit of the range in which Soviet strategic attack forces are likely to fall in the absence of a strategic arms limitation agreement.

223. Adoption of Force 1 would imply that the Soviets were willing to accept some deterioration of their strategic capabilities relative to US forces. Force 1 still would provide the Soviets with strong retaliatory capabilities against US programmed forces throughout the decade. But after 1975, if the US were to deploy other proposed forces—say, more than the four Safeguard sites or additional MIRVs—Soviet forces would have to be augmented much more rapidly than illustrated in this force to maintain a strong retaliatory capability.

224. Survivability is enhanced by the continuing deployment of Y-class SSBNs to a programmed force level of some 40 units. Penetration of ABM defenses would be improved by replacing some of the SS-11 Mod 1 force with the Mod 2. The retrofit of the SS-9 with an accurate 6-MIRV payload beginning in 1977 would improve counterforce as well as retaliatory capabilities. The SS-7 and SS-8 missiles are maintained for most of the decade. The bomber force is gradually reduced through attrition and the phaseout of older aircraft.

225. The Soviets might adopt Force 1 if they were convinced that US forces were not going to develop at a pace more rapid than the programmed forces and if they felt a need to cut back expenditures on forces for intercontinental attack. Implementation of Force Model 1 would result in substantial savings compared with spending levels for intercontinental attack forces in the late 1960s.

ILLUSTRATIVE FORCE MODEL 1
(Mid-1976)

	Delivery vehicles	Independently targeted re-entry vehicles
ICBMs	1,298	1,298
SS-7	66	66
SS-8	9	9
SS-9	240	240
Mod 2	(192)	(192)
Mod 3	(18)	(18)
Mod 4 (3-MRVs)	(30)	(30)
New Large Missile, 1 RV, 0.5 n.m. CEP	73	73
SS-11 [a]	850	850
Mod 1	(650)	(650)
Mod 2	(200)	(200)
SS-13	60	60
SLBMs	646	646
G-II [b]	1/[b]	
H-III/SS-NX-8	1/6	6
Y/SS-N-6	40/640	640
Bombers	110	
Bear ASM Carrier	65	
Bear Bomber	15	
Bison Bomber	30	
TOTAL	2,054	1,944

[a] Does not include silos at Derazhnya and Pervomaysk.

[b] The number and type of missiles this submarine will carry have not been determined.

Illustrative Force Model 4: Maximum Posture Without Arms Limitation

226. Force 4, which is similar to illustrative Force D in NIE 11-8-70, illustrates what we believe would be a maximum Soviet effort. It represents the simultaneous deployment of systems at about the highest sustained rate ever achieved in the past. Rapid technological progress is assumed for all systems. Parallel developments in strategic defense programs on the order of Force Model IV in NIE 11-3-71, "Soviet Strategic Defenses", dated 25 February 1971, TOP SECRET,
are assumed. We consider that this illustrative force represents the highest resource allocation the Soviets would make to intercontinental attack forces during peacetime.

227. Like Force 1, Force 4 is an artificial one in that it was deliberately designed to represent the limit of a range. It is only a rough upper limit because we are not able to place a quantitative limit on any of the physical factors which constrain deployment levels for major weapon systems. It represents a formidable undertaking in terms of the size and pace of major weapons programs. It also represents our view of maximum technical progress, and we believe the rate and extent of progress postulated could not be reached unless the Soviets were making an all-out R&D effort.

228. Force 4 would provide the USSR with excellent strategic capabilities through the 1970s, even when compared with the US Augmented II Force. The MIRVs in the submarine force would enable the Soviets to target a large number of soft military targets as well as to maintain an independent retaliatory capability. In 1979, the number of accurate weapons in the Soviet ICBM force would be theoretically capable of destroying some 90 percent of US land-based missiles in a counterforce pre-emptive strike. Even so, the Soviets could still expect to receive extremely high levels of damage from surviving US forces—even US Programmed Forces.

229. Counterforce capabilities would be obtained primarily by deployment of an accurate 6-MIRV payload on the SS-9 beginning in late 1973. Both large and small ICBMs would be hardened by reconstruction or replacement with the new types of silos. In addition to the hardening program, retaliatory capabilities would be improved by building small new missiles, introducing a mobile missile in 1975, and adding to the sea-based force a new SSBN with a long-range missile.

230. The soft ICBM sites would be deactivated. Although the current bomber force would be reduced somewhat, Backfire deployment would reach a level of some 250 by the late 1970s.

231. The Soviets might undertake such a buildup if the US were to begin a massive buildup of its own strategic forces in a clear effort to upset the present balance. They might also do so in an effort to achieve some measure of recognizable superiority over the US. They would probably see both political and military utility in achievement of such a posture, although they would also see considerable economic disadvantage. Moreover, they would be unlikely to embark on such a course unless they judged that the US would not react in such a way as to offset the Soviet effort.

ILLUSTRATIVE FORCE MODEL 4
(Mid-1976)

	Delivery vehicles	Independently targeted re-entry vehicles
ICBMs	1,823	3,743
SS-7	66	66
SS-8	9	9
SS-9	194	194
Mod 2	(146)	(146)
Mod 3	(18)	(18)
Mod 4 (3-MRVs)	(30)	(30)
New Large Missile, 6-MIRV, 0.25 n.m. CEP	244	1,464
SS-11 [a]	750	750
Mod 1	(500)	(500)
Mod 2	(250)	(250)
New Small Missile, 3-MIRV, 0.25 n.m. CEP	350	1,050
SS-13	60	60
Mobile	150	150
SLBMs	870	1,330
G-III [b]	1/ [b]	
H-III/SS-NX-8 3-MIRV, 0.3 n.m. CEP	1/6	18
Y/SS-N-6	40/640	640
New SSBN/SS-NX-8 3-MIRV, 0.3 n.m. CEP	14/224	672
Bombers	235	—
Bear ASM Carrier	70	
Bear Bomber	30	
Bison Bomber	35	
Backfire [c]	100	
TOTAL	2,928	5,073

[a] Does not include silos at Derazhnya and Pervomaysk.

[b] The number and type of missiles this submarine will carry have not been determined.

[c] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

Illustrative Force Model 2: Maintenance of Parity Without an Arms Limitation Agreement

232. Force 2 is a set of three illustrative forces that are intended to represent different ways the Soviets could maintain strong retaliatory capabilities against a range of US threats. This set is similar to the B set of forces in NIE 11-8-70. These illustrative forces are based on three assumptions:

(a) The Soviets will continue to spend annually about as much on intercontinental attack forces as they have in recent years.

(b) Their estimate of the likely US strategic threat will correspond to US programmed forces for the next few years and on the order of the postulated US Augmented I Force for the late 1970s.

(c) The Soviets will want to have about the same level of retaliatory capability against the US Augmented I Force that they now have against present US forces and sufficient retaliatory capability to serve as a deterrent even if the postulated US Augmented II force is deployed in the late 1970s.

233. The total number of large missiles and SS-9s differs among the three forces. In Force 2A, we assume that new large silos will replace SS-9 silos so that the maximum number of SS-9 and new large silos is 288. In the two other cases we assume that some new large silos are constructed to augment the existing SS-9 force before retrofit of existing SS-9 silos is begun. In Force 2B we postulate an addition of 50 large silos to the SS-9 force which gives an ultimate force level of 338 SS-9s and new large missiles. In Force 2C, we add 100 new large silos to the SS-9 force, which raises the number of SS-9s and new large missiles to 388.

234. Similarly, the total number of new small missiles and SS-11s differs among the three forces. In one force, we assume that

the new missile is retrofitted into SS-11 silos and the total number of silos would remain at 850. In the two other cases, we assume that new small silos are built at ICBM complexes. One hundred new small silos are added to the SS-11s in one force, which produces a combined force level of 950; the other force includes 200 new small silos for a combined total of 1,050.

235. Another principal difference among the three forces is in the type of MIRVs developed and the timing of their deployment.

236. Force 2A assumes that the Soviets successfully achieve an early IOC date for an accurate MIRV. MIRV payloads (3 RVs with 0.25 n.m. CEP) would be introduced on a new large missile and on a new small missile in late 1973. An accurate 6-MIRV system would be deployed on a new large missile in the late 1970s. The SLBMs would be outfitted with 3-MIRV payloads starting in 1978.

237. Force 2B assumes that the Soviets are successful in developing MIRVs at an early date but do not at first improve the accuracy over current missile systems. Thus, a 3-MIRV payload with an accuracy of 0.5 n.m. CEP would be deployed on a new large missile starting in late 1973; a 3-MIRV payload with an accuracy of 0.6 n.m. CEP would be deployed on a new small missile at the same time. More accurate MIRV payloads for the new large missile (0.25 n.m. CEP) are introduced later in the decade.

238. Force 2C assumes that the Soviets do not deploy any MIRVs for several years but instead deploy additional delivery vehicles—ICBMs and SLBMs—to compensate for the absence of MIRVs in the near term. An accurate MIRV payload (0.25 n.m. CEP) is deployed on a new large missile in the mid-1970s in Force 2C.

239. SS-13 deployment stops at 60 launchers in all three forces.

240. Two alternative SLBM forces are presented for Forces 2A and 2B. Alternative 1 assumes that the Soviets build 50 Y-class submarines and develop a longer range missile for it. Alternative 2 assumes that construction of Y-class submarines stops at 40 units and 10 new SSBNs which carry the SS-NX-8 are deployed. Two alternative SLBM forces are presented for Force 2C also. They differ from the two SLBM alternatives included in 2A and 2B in two aspects: (a) they include 10 additional SSBNs and (b) they do not have MIRVs.

241. The current bomber force is reduced somewhat through attrition in all three forces, and the Backfire is deployed starting in 1974. By the late 1970s, some 25-50 Bear aircraft carrying ASMs and some 150 Backfire would make up the intercontinental bomber force.

242. Forces 2A, 2B, and 2C are intended to show possible variations in the size and capabilities of Soviet intercontinental attack forces during the 1970s, if the Soviets place major emphasis on a strong retaliatory capability and in addition seek some improvement in counterforce capabilities. They have comparable capabilities, although Force 2C would be somewhat more potent than Forces 2A and 2B in the late 1970s because by then it has accurate MIRVs and a larger number of delivery vehicles.

ILLUSTRATIVE FORCE MODELS 2A, 2B, AND 2C
(MID-1976)

	2A		2B		2C	
	Delivery Vehicles	Independently Targeted Re-entry Vehicles	Delivery Vehicles	Independently Targeted Re-entry Vehicles	Delivery Vehicles	Independently Targeted Re-entry Vehicles
ICBMs	1,373	1,861	1,278	2,180	1,548	1,673
SS-7	66	66	66	66	66	66
SS-8	9	9	9	9	9	9
SS-9	144	144	114	114	288	288
Mod 1	..	..	..	..	(48)	(48)
Mod 2	(96)	(96)	(66)	(66)	(192)	(192)
Mod 3	(18)	(18)	(18)	(18)	(18)	(18)
Mod 4 (3 MRV)	(30)	(30)	(30)	(30)	(30)	(30)
New Large Missile	144	432	179	681	75	200
New 1 RV	..	..	..	..	(50)	(50)
3-MIRV [a]	(144)	(432)	(131)	(393)	..	..
6-MIRV, 0.25 n.m. CEP	..	..	(48)	(288)	(25)	(150)
SS-11 [b]	850	850	650	650	850	850
Mod 1	(450)	(450)	(450)	(450)	(450)	(450)
Mod 2	(400)	(400)	(200)	(200)	(400)	(400)
New Small Missile	100	300	200	600	200	200
1-RV, 0.6 n.m. CEP	..	..	..	..	(200)	(200)
3-MIRV [c]	(100)	(300)	(200)	(600)	..	..
SS-13	60	60	60	60	60	60
SLBMs	806	806	806	806	870–966	870–966
G-III [d]	1/[d]	[d]	1/[d]	[d]	1/[d]	[d]
H-III/SS-NX-8	1/6	6	1/6	6	1/6	6
Alternative 1						
Y/SS-N-6	34/544	544	34/544	544	44/704	704
Y/New Missile	16/256	256	16/256	256	16/256	256
Alternative 2						
Y/SS-N-6	40/640	640	40/640	640	40/640	640
New SSBN/SS-NX-8	10/160	160	10/160	160	14/224	224
Bombers	190	.....	190	.....	190	.....
Bear ASM Carrier	65	.....	65	.....	65	.....
Bear Bomber	15	.....	15	.....	15	.....
Bison Bomber	30	.....	30	.....	30	.....
Backfire [e]	80	.....	80	.....	80	.....
Total	2,369	2,667	2,274	2,986	2,608–2,704	2,543–2,639

[a] This MIRV has a CEP of 0.25 n.m. in Force 2A and 0.5 n.m. in Force 2B.

[b] Does not include silos at Derazhnya and Pervomaysk.

[c] This MIRV has a CEP of 0.25 n.m. in Force 2A and 0.6 n.m. in Force 2B.

[d] The number and type of missiles this submarine will carry have not been determined.

[e] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

Illustrative Force Model 3: Counterforce Against Minuteman

243. As we did in NIE 11-8-70 (Illustrative Force Model C) we have included a force which illustrates the type of effort the Soviets would have to undertake if they placed top priority on acquiring a capability to destroy the US Minuteman force while at the same time retaining enough weapons to attack other military and industrial targets. This force would provide by the late 1970s a theoretical capability to destroy more than 90 percent of the US ICBM force presently deployed—the bulk of which we assume will by then be hardened to about 1,000 psi—in a surprise first strike.

244. The Soviets would probably choose this course only if they believed that an improvement in their strategic defense forces—on the order of Model IV in NIE 11-3-71—would reduce the destructive potential of surviving US missiles and bombers to an acceptable level. The defensive improvements would have to include the successful development of ASW measures and bomber defenses as well as ABM systems.

245. The counterforce capability of Force 3 results primarily from the increase in new large missile deployment and the fitting out of SS-9 silos with an accurate (0.25 n.m. CEP) 6-MIRV payload. The retrofit program would begin in 1974 and be completed in 1979. In order to achieve the desired 90 percent kill probability of the hardened Minuteman silos, the counterforce capability of the large missiles must be augmented by new small missiles which have an accurate guidance system—0.25 n.m. CEP.

246. The SLBM and bomber forces of Force 3 are similar to those in Forces 2A and 2B.

ILLUSTRATIVE FORCE MODEL 3
(Mid-1976)

	Delivery vehicles	Independently targeted re-entry vehicles
ICBMs	1,423	2,643
SS-7	66	66
SS-8	9	9
SS-9	194	194
Mod 2	(146)	(146)
Mod 3	(18)	(18)
Mod 4 (3-MRVs)	(30)	(30)
New Large Missile, 6-MIRV, 0.25 n.m. CEP	244	1,464
SS-11 [a]	600	600
Mod 1	(400)	(400)
Mod 2	(200)	(200)
New Small Missile, 1 RV, 0.25 n.m. CEP	250	250
SS-13	60	60
SLBMs	806	806
G-III [b]	1/[b]	[b]
H-III/SS-NX-8	1/6	6
Alternative 1		
Y/SS-N-6	34/544	544
Y/New Missile	16/256	256
Alternative 2		
Y/SS-N-6	40/640	640
New SSBN/SS-NX-8	10/160	160
Bombers	190	—
Bear ASM Carrier	65	
Bear Bomber	15	
Bison Bomber	30	
Backfire [c]	80	
TOTAL	2,419	3,449

[a] Does not include silos at Derazhnya and Pervomaysk.

[b] The number and type of missiles this submarine will carry have not been determined.

[c] There are differing views on the primary mission of the Backfire (see paragraphs 135 and 203).

Likely Soviet Courses of Action Without Arms Control

247. We do not consider either of the illustrative limiting cases to be a likely Soviet course of action. It seems improbable that if the US went ahead with something like its programmed forces the Soviets would accept the deterioration in their strategic position implicit in Force 1. It may be, of course, that the Soviets will have to settle, at least temporarily, for reduced retaliatory capabilities as US programmed forces are deployed, but we do not think they would do so as a matter of choice. They would be unlikely to limit their forces to the levels of Force 1 in the absence of an arms control agreement, or even with a tacit one. We also believe that the pace of Soviet technical advance will lead their forces by the late 1970s well beyond the limited advances in Force 1. And finally, although the Soviets have been concerned to hold down military spending, we believe that they are unlikely to feel compelled to reduce expenditures for intercontinental forces appreciably below current levels.

248. We also consider it unlikely that the Soviets would come close to the levels of effort illustrated by Force 4, except possibly in response to a breakdown in SALT followed by a US force buildup substantially larger than the ones depicted in paragraph 177 as representing likely Soviet perceptions of the threat. We think the Soviets would consider the costs to be too heavy and the likelihood of stimulating offsetting US counteraction too great. Moreover, Soviet efforts have not reflected the sense of urgency that would be apparent if the Soviets were in fact now planning the development of Force 4.

249. We also think something like Force 3 would be unlikely. Recent Soviet efforts have been directed primarily at developing systems to penetrate US ABM defenses and at improvements in force survivability and give no indication that development of hard target capabilities is to be given increased emphasis. Moreover, we doubt that the Soviets would pursue the single-minded effort to build up counterforce capabilities as rapidly as illustrated in Force 3—with the high cost it would entail—unless they felt they could cope more adequately with the US Polaris and bomber threats than appears likely, at least for some time in the future. They would also have to be concerned that the US would react to such a buildup with large new programs of its own to ensure the survival of adequate retaliatory forces and perhaps to increase US counterforce capabilities as well.

250. Barring an arms control agreement or a significant slowing in projected US strategic programs, we believe that the likely Soviet course of action would be something like the levels of effort represented in the Force 2 group. Each of these forces has been modeled to preserve strong retaliatory capabilities against US forces at levels of expenditure comparable to current levels. The Soviets could achieve something less or something more than the capability of these forces depending on who is doing the viewing, on what kind of Force 2 the Soviets deploy, and on the extent to which the US increases or decreases programmed forces in the future. The Soviets may opt for the introduction of accurate MIRVs (0.25 n.m. CEP) as early as possible. This objective is best met by Force 2A, which introduces accurate MIRVs at the earliest estimated feasible date.

251. Either the accuracy improvement or the MIRV development program could, of course, slip. If the Soviets get an early MIRV but are delayed in attaining significant improvement in accuracy, they might go in the direction of Force 2B, deploying the MIRV when it becomes available and improving its accuracy later. Force 2B is also representative

of the kind of force that the Soviets might deploy if they are less concerned with keeping pace with the US. If it should take the Soviets until 1975 to finish their flight testing of a MIRV—a delay which we consider much less likely than the delay in attaining improved accuracy—we believe the Soviets would probably attempt to compensate by continuing to build more hardened launchers until a MIRV becomes available. In this case, the Soviet forces in the 1970s might look more like Force 2C.

252. But these projections are necessarily illustrative at best. There are reasons why the Soviets might be willing to settle at least temporarily for rates of force buildup below those illustrated by Force 2. Their lead in numbers of ICBMs present and projected, for example, might cause them to believe they had some extra leeway. On the other hand, some Soviet leaders would doubtless seek larger forces because of their commitment to particular weapon programs, because they perceived opportunities to improve the USSR's overall strategic position and bargaining power vis-à-vis the US, or for some other reason. In any case, the Soviets are almost certain in the course of the next 5 to 10 years to embark on some strategic programs of which we presently have little or no inkling. As in the past, the Soviets will doubtless continue to make strategic program decisions which we find hard to explain in terms of clear-cut military or political goals.

COMPARISON OF ILLUSTRATIVE FORCE MODELS OF SOVIET INTERCONTINENTAL ATTACK FORCES
(DELIVERY VEHICLES, MID-1976)

	SALT 1	SALT 2	1	2A	2B	2C	3	4
ICBMs	1,593	1,593	1,298	1,373	1,278	1,548	1,423	1,823
SS-7	190	190	66	66	66	66	66	66
SS-8	19	19	9	9	9	9	9	9
SS-9	108	96	240	144	114	288	194	194
Mod 1	..	..	..	..	..	(48)	..	..
Mod 2	(60)	(48)	(192)	(96)	(66)	(192)	(146)	(146)
Mod 3	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)
Mod 4 (MRV)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)
New Large Missile	180	192	73	144	179	75	244	244
1-RV	..	..	(73)	..	..	(50)	..	..
3-MIRV [a]	(180)	..	..	(144)	(131)	..	..	..
6-MIRV, .25 n.m. CEP	..	(192)	..	..	(48)	(25)	(244)	(244)
SS-11 [b]	836	736	850	850	650	850	600	750
Mod 1	(620)	(520)	(650)	(450)	(450)	(450)	(400)	(500)
Mod 2	(216)	(216)	(200)	(400)	(200)	(400)	(200)	(250)
New Small Missile-1 RV [c]	..	..	..	..	..	200	250	..
3-MIRV [d]	200	300	..	100	200	..	..	350
SS-13	60	60	60	60	60	60	60	60
Mobile	..	..	..	..	..	..	..	150
SLBMs	646	646	646	806	806	870–966	806	870
G-III [e]			•	•	•	•	•	•
H-III/SS-NX-8	6	6 [f]	6	6	6	6	6	6 [f]
Y/SS-N-6	384	384	640	640–544	640–544	640–704	640–544	640
Y/New Missile	256	256 [g]	..	0–256	0–256	0–256	0–256	..
New SSBN/SS-NX-8	..	..	..	160– 0	160– 0	224– 0	160– 0	224 [f]
Bombers	190	235	110	190	190	190	190	235
Bear ASM Carrier	65	70	65	65	65	65	65	70
Bear Bomber	15	30	15	15	15	15	15	30
Bison Bomber	30	35	30	30	30	30	30	35
Backfire [h]	80	100	..	80	80	80	80	100
Total	2,429 [b]	2,474 [b]	2,054	2,369	2,274	2,608–2,704	2,419	2,928

[a] This MIRV has a CEP of 0.25 n.m. in Force 2A and 0.5 n.m. in Force SALT 1 and Force 2B.

[b] ICBM silos at Derazhnya and Pervomaysk are included in the SALT forces but not in the others.

[c] This missile has a CEP of 0.25 n.m. in Force 3 and 0.6 n.m. in Force 2C.

[d] This MIRV has a CEP of 0.25 n.m. in Force SALT 2, Force 2A and Force 4 and 0.6 n.m. in Force SALT 1 and Force 2B.

[e] One G-III class submarine is postulated, but the number and type of missiles this submarine will carry have not been determined.

[f] All have 3 MIRVs, 0.3 n.m. CEP.

[g] All have 3 MIRVs, 0.25 n.m. CEP.

[h] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

[Reverse blank]

APPENDIX TO SECTION X

ILLUSTRATIVE FORCE MODEL PROJECTIONS BY YEAR 1971-1979

ILLUSTRATIVE FORCE MODEL PROJECTIONS BY YEAR 1971-1979

The alternative force developments presented in this Appendix represent possible directions that Soviet intercontinental attack forces could take. It should be emphasized that we consider no one of them an estimate that Soviet intercontinental attack forces will be composed of the particular weapon systems in the precise numbers listed. They are intended only to be illustrative models of possible trends and differing emphases, and as such are not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

[p. 78 blank]

SALT FORCE I [a]
(mid-year)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
ICBMs									
SS-7	190	190	190	190	190	190	190	190	190
SS-8	19	19	19	19	19	19	19	19	19
SS-9	276	288	288	228	168	108	48	18	0
Mod 1	[	48	48	0	0	0	0	0	0
Mod 2		192	192	180	120	60	0	0	0
Mod 3		18	18	18	18	18	18	18	0
Mod 4 (3-MRV)	]	30	30	30	30	30	30	0	0
New Large Missile	0	0	0	60	120	180	240	270	288
3-MIRV, 0.5 n.m. CEP	0	0	0	60	120	180	240	240	228
6-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	30	60
SS-11 [b]	970	1,036	1,036	1,016	936	836	736	636	536
Mod 1	970	970	920	800	720	620	520	420	320
Mod 2	0	66	116	216	216	216	216	216	216
New Small Missile									
3-MIRV, 0.6 n.m. CEP	0	0	0	20	100	200	300	400	500
SS-13	40	60	60	60	60	60	60	60	60
Total ICBMs	1,495	1,593	1,593	1,593	1,593	1,593	1,593	1,593	1,593
SLBMs									
H-II/SS-N-5	8/24	8/24	8/24	8/24	8/24	0	0	0	0
H-III/SS-NX-8	0	0	1/6	1/6	1/6	1/6	1/6	1/6	1/6
Y/SS-N-6	22/352	30/480	39/624	40/640	32/512	24/384	16/256	8/128	0
Y/New SLBM	0	0	0	0	8/128	16/256	24/384	24/384	24/384
Y/New SLBM, 3-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	8/128	16/256
Total SLBMs	30/376	38/504	48/654	49/670	49/670	41/646	41/646	41/646	41/646
Bombers									
Bear ASM Carrier	70	70	70	70	70	65	60	50	25
Bear Bomber	35	30	25	20	20	15	10	0	0
Bison Bomber	35	35	35	35	35	30	25	25	20
Bison Tanker	(50)	(50)	(50)	(50)	(50)	(50)	(30)	(20)	(20)
Backfire [c]	0	0	0	15	45	80	115	150	150
Total Bombers	140	135	130	140	170	190	210	225	195

[a] This force model is illustrative of a possible trend and emphasis, and, as such is not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

[b] Includes 850 SS-11 silos at ICBM complexes and ICBM silos at Derazhnya and Pervomaysk.

[c] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

SALT FORCE 2 [a]
(mid-year)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
ICBMs									
SS-7	190	190	190	190	190	190	190	190	190
SS-8	19	19	19	19	19	19	19	19	19
SS-9	276	288	288	240	168	96	0	0	0
Mod 1	[redacted]	48	48	0	0	0	0	0	0
Mod 2		192	192	192	120	48	0	0	0
Mod 3		18	18	18	18	18	0	0	0
Mod 4 (3-MRV)		30	30	30	30	30	0	0	0
New Large Missile 6-MIRV, 0.25 n.m. CEP	0	0	0	48	120	192	288	288	288
SS-11 [b]	970	1,036	1,036	1,016	886	736	586	436	286
Mod 1	970	970	920	800	670	520	370	220	70
Mod 2	0	66	116	216	216	216	216	216	216
New Small Missile 3-MIRV, 0.25 n.m. CEP	0	0	0	20	150	300	450	600	750
SS-13	40	60	60	60	60	60	60	60	60
Total ICBMs	1,495	1,593	1,593	1,593	1,593	1,593	1,593	1,593	1,593
SLBMs									
H-II/SS-N-5	8/24	8/24	8/24	8/24	8/24	0	0	0	0
H-III/SS-NX-8	0	0	1/6	0	0	0	0	0	0
H-III/SS-NX-8, 3-MIRV, 0.3 n.m. CEP	0	0	0	1/6	1/6	1/6	1/6	1/6	1/6
Y/SS-N-6	22/352	30/480	39/624	40/640	33/528	24/384	17/272	8/128	0
Y/New SLBM, 3-MIRV, 0.25 n.m. CEP	0	0	0	0	7/112	16/256	23/368	32/512	40/640
Total SLBMs	30/376	38/504	48/654	49/670	49/670	41/646	41/646	41/646	41/646
Bombers									
Bear ASM Carrier	70	70	70	70	70	70	70	70	65
Bear Bomber	35	35	35	35	30	30	25	25	20
Bison Bomber	35	35	35	35	35	35	35	35	30
Bison Tanker	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)
Backfire [c]	0	0	0	15	50	100	150	200	250
Total Bombers	140	140	140	155	185	235	280	330	365

[a] This force model is illustrative of a possible trend and emphasis, and, as such is not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

[b] Includes 850 SS-11 silos at ICBM complexes and ICBM silos at Derazhnya and Pervomaysk.

[c] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

FORCE 1 Outside SALT [a]
(mid-year)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
ICBMs									
SS-7	190	190	190	148	106	66	66	30	0
SS-8	19	19	19	19	9	9	0	0	0
SS-9	276	288	288	288	264	240	216	168	120
Mod 1		48	48	48	24	0	0	0	0
Mod 2		192	192	192	192	192	168	120	72
Mod 3		18	18	18	18	18	18	18	18
Mod 4 (3-MRV)		30	30	30	30	30	30	30	30
New Large Missile	0	0	0	25	49	73	97	145	193
1-RV, 0.5 n.m. CEP	0	0	0	25	49	73	97	97	97
6-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	48	96
SS-11 [b]	850	850	850	850	850	850	850	850	850
Mod 1	850	800	750	700	650	650	650	650	650
Mod 2	0	50	100	150	200	200	200	200	200
SS-13	40	60	60	60	60	60	60	60	60
Total ICBMs	1,375	1,407	1,407	1,390	1,338	1,298	1,289	1,253	1,223
SLBMs									
G-II/SS-N-5 [c]	10/30	8/24	6/18	4/12	0	0	0	0	0
G-III [d]	0	0	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]
H-II/SS-N-5	8/24	8/24	8/24	8/24	8/24	0	0	0	0
H-III/SS-NX-8	0	0	1/6	1/6	1/6	1/6	1/6	1/6	1/6
Y/SS-N-6	22/352	30/480	39/624	40/640	40/640	40/640	40/640	40/640	40/640
Total SLBMs	40/406	46/528	55/672	54/682	50/670	42/646	42/646	42/646	42/646
Bombers									
Bear ASM Carrier	70	70	70	70	70	65	60	50	25
Bear Bomber	35	30	25	20	20	15	10	0	0
Bison Bomber	35	35	35	35	35	30	25	25	20
Bison Tanker	(50)	(50)	(50)	(50)	(50)	(50)	(30)	(20)	(20)
Total Bombers	140	135	130	125	125	110	95	75	45

[a] This force model is illustrative of a possible trend and emphasis, and, as such is not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

[b] Does not include silos at Derazhnya and Pervomaysk.

[c] There is considerable uncertainty as to the primary mission of these submarines (see paragraph 109). It is believed, however, that by the mid-1970s they will have been assigned to a peripheral strike role.

[d] The number and type of missiles this submarine will carry have not been determined.

FORCE 2A Outside SALT *
(mid-year)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
ICBMs									
SS-7	190	190	190	148	106	66	66	30	0
SS-8	19	19	19	19	9	9	0	0	0
SS-9	276	288	288	240	192	144	96	48	0
Mod 1		48	48	0	0	0	0	0	0
Mod 2		192	192	192	144	96	48	0	0
Mod 3		18	18	18	18	18	18	18	0
Mod 4 (3-MRV)		30	30	30	30	30	30	30	0
New Large Missile	0	0	0	48	96	144	192	240	288
3-MIRV, 0.25 n.m. CEP	0	0	0	48	96	144	192	192	192
6-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	48	96
SS-11 [b]	850	850	850	850	850	850	750	650	550
Mod 1	850	800	750	650	550	450	350	250	150
Mod 2	0	50	100	200	300	400	400	400	400
New Small Missile 3-MIRV, 0.25 n.m. CEP	0	0	0	20	50	100	200	300	400
SS-13	40	60	60	60	60	60	60	60	60
Total ICBMs	1,375	1,407	1,407	1,385	1,363	1,373	1,364	1,328	1,298
SLBMs									
G-II/SS-N-5 [c]	10/30	8/24	6/18	4/12	0	0	0	0	0
G-III [d]	0	0	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]
H-II/SS-N-5	8/24	8/24	8/24	8/24	8/24	0	0	0	0
H-III/SS-NX-8	0	0	1/6	1/6	1/6	1/6	1/6	1/6	1/6
Alternative 1									
Y/SS-N-6	22/352	30/480	39/624	48/768	42/672	34/544	26/416	18/288	10/160
Y/New SLBM	0	0	0	0	8/128	16/256	24/384	24/384	24/384
Y/New SLBM 3-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	8/128	16/256
Total SLBMs	40/406	46/528	55/672	62/810	60/830	52/806	52/806	52/806	52/806
Alternative 2									
Y/SS-N-6	22/352	30/480	39/624	40/640	40/640	40/640	40/640	32/512	24/384
Y/New SLBM, 3-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	8/128	16/256
New SSBN/SS-NX-8	0	0	0	0	7/112	10/160	10/160	10/160	10/160
Total SLBMs	40/406	46/528	55/672	54/632	57/782	52/806	52/806	52/806	52/806
Bombers									
Bear ASM Carrier	70	70	70	70	70	65	60	50	25
Bear Bomber	35	30	25	20	20	15	10	0	0
Bison Bomber	35	35	35	35	35	30	25	25	20
Bison Tanker	(50)	(50)	(50)	(50)	(50)	(50)	(30)	(20)	(20)
Backfire [e]	0	0	0	15	45	80	115	150	150
Total Bombers	140	135	130	140	170	190	210	225	195

* This force model is illustrative of a possible trend and emphasis, and, as such is not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

[b] Does not include silos at Derazhnya and Pervomaysk.

[c] There is considerable uncertainty as to the primary mission of these submarines (see paragraph 109). It is believed, however, that by the mid-1970s they will have been assigned to a peripheral strike role.

[d] The number and type of missiles this submarine will carry have not been determined.

[e] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

FORCE 2B Outside SALT [a]
(mid-year)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
ICBMs									
SS-7	190	190	190	148	106	66	66	30	0
SS-8	19	19	19	19	9	9	0	0	0
SS-9	276	288	288	210	162	114	66	18	0
Mod 1	[	48	48	0	0	0	0	0	0
Mod 2		192	192	162	114	66	18	0	0
Mod 3		18	18	18	18	18	18	18	0
Mod 4 (3-MRV)	]	30	30	30	30	30	30	0	0
New Large Missile	0	0	0	78	126	179	233	290	338
3-MIRV, 0.5 n.m. CEP	0	0	0	78	126	131	131	131	131
6-MIRV, 0.25 n.m. CEP	0	0	0	0	0	48	102	159	207
SS-11 [b]	850	850	850	830	750	650	550	450	350
Mod 1	850	800	750	630	550	450	350	250	150
Mod 2	0	50	100	200	200	200	200	200	200
New Small Missile 3-MIRV, 0.6 n.m. CEP	0	0	0	20	100	200	300	400	500
SS-13	40	60	60	60	60	60	60	60	60
Total ICBMs	1,375	1,407	1,407	1,365	1,313	1,278	1,275	1,248	1,248
SLBMs									
G-II/SS-N-5 [c]	10/30	8/24	6/18	4/12	0	0	0	0	0
G-III [d]	0	0	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]
H-II/SS-N-5	8/24	8/24	8/24	8/24	8/24	0	0	0	0
H-III/SS-NX-8	0	0	1/6	1/6	1/6	1/6	1/6	1/6	1/6
Alternative 1									
Y/SS-N-6	22/352	30/480	39/624	48/768	42/672	34/544	26/416	18/288	10/160
Y/New SLBM	0	0	0	0	8/128	16/256	24/384	24/384	24/384
Y/New SLBM, 3-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	8/128	16/256
Total SLBMs	40/406	46/528	55/672	62/810	60/830	52/806	52/806	52/806	52/806
Alternative 2									
Y/SS-N-6	22/352	30/480	39/624	40/640	40/640	40/640	40/640	32/512	24/384
Y/New SLBM, 3-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	8/128	16/256
New SSBN/SS-NX-8	0	0	0	0	7/112	10/160	10/160	10/160	10/160
Total SLBMs	40/406	46/528	55/672	54/682	57/782	52/806	52/806	52/806	52/806
Bombers									
Bear ASM Carrier	70	70	70	70	70	65	60	50	25
Bear Bomber	35	30	25	20	20	15	10	0	0
Bison Bomber	35	35	35	35	35	30	25	25	20
Bison Tanker	(50)	(50)	(50)	(50)	(50)	(50)	(30)	(20)	(20)
Backfire [e]	0	0	0	15	45	80	115	150	150
Total Bombers	140	135	130	140	170	190	210	225	195

[a] This force model is illustrative of a possible trend and emphasis, and, as such is not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

[b] Does not include silos at Derazhnya and Pervomaysk.

[c] There is considerable uncertainty as to the primary mission of these submarines (see paragraph 109). It is believed, however, that by the mid-1970s they will have been assigned to a peripheral strike role.

[d] The number and type of missiles this submarine will carry have not been determined.

[e] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

FORCE 2C Outside SALT *

	1971	1972	1973	1974	1975	1976	1977	1978	1979
ICBMs									
SS-7	190	190	190	148	106	66	66	30	0
SS-8	19	19	19	19	9	9	0	0	0
SS-9	276	288	288	288	288	288	288	240	192
Mod 1	[ ]	48	48	48	48	48	48	0	0
Mod 2		192	192	192	192	192	192	192	144
Mod 3		18	18	18	18	18	18	18	18
Mod 4 (3-MRV)	[ ]	30	30	30	30	30	30	30	30
New Large Missile	0	0	0	25	50	75	100	148	196
1-RV, 0.5 n.m. CEP	0	0	0	25	50	50	50	50	50
6-MIRV, 0.25 n.m. CEP	0	0	0	0	0	25	50	98	146
SS-11 [b]	850	850	850	850	850	850	750	650	550
Mod 1	850	800	750	650	550	450	350	250	150
Mod 2	0	50	100	200	300	400	400	400	400
New Small Missile 1-RV, 0.6 n.m. CEP	0	0	0	20	100	200	300	400	500
SS-13	40	60	60	60	60	60	60	60	60
Total ICBMs	1,375	1,407	1,407	1,410	1,463	1,548	1,564	1,528	1,498
SLBMs									
G-II/SS-N-5 [c]	10/30	8/24	6/18	4/12	0	0	0	0	0
G-III [d]	0	0	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]
H-II/SS-N-5	8/24	8/24	8/24	8/24	8/24	0	0	0	0
H-III/SS-NX-8	0	0	1/6	1/6	1/6	1/6	1/6	1/6	1/6
Alternative 1									
Y/SS-N-6	22/352	30/480	39/624	48/768	48/768	44/704	36/576	28/448	20/320
Y/New SLBM	0	0	0	0	8/128	16/256	24/384	32/512	40/640
Total SLBMs	40/406	46/528	55/672	62/810	66/926	62/966	62/966	62/966	62/966
Alternative 2									
Y/SS-N-6	22/352	30/480	39/624	40/640	40/640	40/640	40/640	32/512	24/384
Y/New SLBM	0	0	0	0	0	0	0	8/128	16/256
New SSBN/SS-NX-8	0	0	0	0	7/112	14/224	20/320	20/320	20/320
Total SLBMs	40/406	46/528	55/672	54/682	57/782	56/870	62/966	62/966	62/966
Bombers									
Bear ASM Carrier	70	70	70	70	70	65	60	50	25
Bear Bomber	35	30	25	20	20	15	10	0	0
Bison Bomber	35	35	35	35	35	30	25	25	20
Bison Tanker	(50)	(50)	(50)	(50)	(50)	(50)	(30)	(20)	(20)
Backfire *	0	0	0	15	45	80	115	150	150
Total Bombers	140	135	130	140	170	190	210	225	195

* This force model is illustrative of a possible trend and emphasis, and, as such is not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

[b] Does not include silos at Derazhnya and Pervomaysk.

[c] There is considerable uncertainty as to the primary mission of these submarines (see paragraph 109). It is believed, however, that by the mid-1970s they will have been assigned to a peripheral strike role.

[d] The number and type of missiles to be carried by this submarine have not been determined.

* There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

FORCE 3 Outside SALT [a]
(mid-year)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
ICBMs									
SS-7	190	190	190	148	106	66	66	30	0
SS-8	19	19	19	19	9	9	0	0	0
SS-9	276	288	288	288	240	194	98	0	0
Mod 1	[	48	48	48	0	0	0	0	0
Mod 2		192	192	192	192	146	50	0	0
Mod 3		18	18	18	18	18	18	0	0
Mod 4 (3-MRV)	]	30	30	30	30	30	30	0	0
New Large Missile 6-MIRV, 0.25 n.m. CEP	0	0	0	50	148	244	390	538	588
SS-11 [b]	850	850	850	830	750	600	450	300	200
Mod 1	850	800	750	630	550	400	250	100	0
Mod 2	0	50	100	200	200	200	200	200	200
New Small Missile 1-RV 0.25 n.m. CEP	0	0	0	20	100	250	400	550	650
SS-13	40	60	60	60	60	60	60	60	60
Total ICBMs	1,375	1,407	1,407	1,415	1,413	1,423	1,464	1,478	1,498
SLBMs									
G-II/SS-N-5 [c]	10/30	8/24	6/18	4/12	0	0	0	0	0
G-III [d]	0	0	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]
H-II/SS-N-5	8/24	8/24	8/24	8/24	8/24	0	0	0	0
H-III/SS-NX-8	0	0	1/6	1/6	1/6	1/6	1/6	1/6	1/6
Alternative 1									
Y/SS-N-6	22/352	30/480	39/624	48/768	42/672	34/544	26/416	18/288	10/160
Y/New SLBM	0	0	0	0	8/128	16/256	24/384	24/384	24/384
Y/New SLBM 3-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	8/128	16/256
Total SLBMs	40/406	46/528	55/672	62/810	60/830	52/806	52/806	52/806	52/806
Alternative 2									
Y/SS-N-6	22/352	30/480	39/624	40/640	40/640	40/640	40/640	32/512	24/384
Y/New SLBM 3-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	8/128	16/256
New SSBN/SS-NX-8	0	0	0	0	7/112	10/160	10/160	10/160	10/160
Total SLBMs	40/406	46/528	55/672	54/682	57/782	52/806	52/806	52/806	52/806
Bombers									
Bear ASM Carrier	70	70	70	70	70	65	60	50	25
Bear Bomber	35	30	25	20	20	15	10	0	0
Bison Bomber	35	35	35	35	35	30	25	25	20
Bison Tanker	(50)	(50)	(50)	(50)	(50)	(50)	(30)	(20)	(20)
Backfire [e]	0	0	0	15	45	80	115	150	150
Total Bombers	140	135	130	140	170	190	210	225	195

[a] This force model is illustrative of a possible trend and emphasis, and, as such is not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

[b] Does not include silos at Derazhnya and Pervomaysk.

[c] There is considerable uncertainty as to the primary mission of these submarines (see paragraph 109). It is believed, however, that by the mid-1970s they will have been assigned to a peripheral strike role.

[d] The number and type of missiles this submarine will carry have not been determined.

[e] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

FORCE 4 Outside SALT [a]
(mid-year)

	1971	1972	1973	1974	1975	1976	1977	1978	1979
ICBMs									
SS-7	190	190	190	148	106	66	66	66	66
SS-8	19	19	19	19	9	9	9	9	9
SS-9	276	288	288	288	240	194	98	0	0
Mod 1	[	48	48	48	0	0	0	0	0
Mod 2		192	192	192	192	146	50	0	0
Mod 3		18	18	18	18	18	18	0	0
Mod 4 (3-MRV)	]	30	30	30	30	30	30	0	0
New Large Missile 6-MIRV, 0.25 n.m. CEP	0	0	0	50	148	244	390	538	588
SS-11 [b]	850	850	850	850	800	750	700	550	400
Mod 1	850	800	700	600	550	500	450	300	150
Mod 2	0	50	150	250	250	250	250	250	250
New Small Missile, 3-MIRV, 0.25 n.m. CEP	0	0	0	50	200	350	500	650	800
SS-13	40	60	60	60	60	60	60	60	60
Mobile	0	0	0	0	50	150	250	300	300
Total ICBMs	1,375	1,407	1,407	1,465	1,613	1,823	2,073	2,173	2,223
SLBMs									
G-II/SS-N-5 [c]	10/30	8/24	6/18	4/12	0	0	0	0	0
G-III [d]	0	0	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]	1/[d]
H-II/SS-N-5	8/24	8/24	8/24	8/24	8/24	0	0	0	0
H-III/SS-NX-8	0	0	1/6	0	0	0	0	0	0
H-III/SS-NX-8, 3-MIRV, 0.3 n.m. CEP	0	0	0	1/6	1/6	1/6	1/6	1/6	1/6
Y/SS-N-6	22/352	30/480	39/624	40/640	40/640	40/640	40/640	32/512	24/384
Y/New SLBM, 3-MIRV, 0.25 n.m. CEP	0	0	0	0	0	0	0	8/128	16/256
New SSBN/SS-NX-8, 3-MIRV, 0.3 n.m. CEP	0	0	0	0	7/112	14/224	20/320	20/320	20/320
Total SLBMs	40/406	46/528	55/662	54/682	57/782	56/870	62/966	62/966	62/966
Bombers									
Bear ASM Carrier	70	70	70	70	70	70	70	70	65
Bear Bomber	35	35	35	35	30	30	25	25	20
Bison Bomber	35	35	35	35	35	35	35	35	30
Bison Tanker	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)	(50)
Backfire [e]	0	0	0	15	50	100	150	200	250
Total Bombers	140	140	140	155	185	235	280	330	365

[a] This force model is illustrative of a possible trend and emphasis, and, as such is not suitable for military planning purposes. For Defense planning purposes the reader should consult the forthcoming Defense Intelligence Projections for Planning (DIPP-72).

[b] Does not include silos at Derazhnya and Pervomaysk.

[c] There is considerable uncertainty as to the primary mission of these submarines (see paragraph 109). It is believed however, that by the mid-1970s they will have been assigned to a peripheral strike role.

[d] The number and type of missiles this submarine will carry have not been determined.

[e] There are differing views on the mission of the Backfire (see paragraphs 135 and 203).

[Reverse blank]

ANNEX A

GLOSSARY OF MISSILE TERMS

GLOSSARY OF MISSILE TERMS

NOTE: This Appendix is virtually the same as Annex A of NIE 11-8-70, except that a definition of nuclear system weight has been added, and one on probability of kill has been deleted.

DEPRESSED TRAJECTORY ICBM (DICBM)

An ICBM system launched on a trajectory having a much lower apogee than one launched on a normal ICBM trajectory. The only Soviet DICBM, the SS-9 Mod 3, is retrofired (see definition below) just prior to reentry to increase the re-entry angle and deboost the re-entry vehicle (RV) onto the desired target.

FRACTIONAL ORBIT BOMBARDMENT SYSTEM (FOBS)

A FOBS is placed into orbit and deorbited on the target prior to completion of the first revolution. Its operational and control requirements are like those for an ICBM; i.e., it is deployed on the ground, targeted prior to launch, and launched with intent to attack. This concept is contrasted with a multiple orbit bombardment system (MOBS) which would be deployed in space, launched into orbit with no immediate commitment to attack, targeted after launch, or retargeted as necessary.

INERTIAL GUIDANCE SYSTEM

A guidance system that is completely contained within the missile and has no link with a ground station after launch. Two principal elements of such guidance systems are:

Accelerometer—A device that measures the missile's acceleration in a given direction. Three accelerometers mounted at right angles to each other can measure the entire acceleration profile of a missile's powered flight.

Gyroscope—A device that measures deviation of the missile away from a reference direction Three gyroscopes mounted at right angles to each other can measure any movement of the missile during powered flight.

OPERATIONAL CHARACTERISTICS

Alert Rate—The percentage of the operational missile force that is maintained in a condition of readiness.

Circular Error Probable (CEP)—A conventional index of accuracy defined as the radius of a circle centered on the intended

[p. 90 blank]

target, within which 50 percent of the arriving missile warheads are expected to fall. The other 50 percent of successfully arriving warheads are expected to detonate within 3½ CEPs of the target.

Initial Operational Capability (IOC)—The date on which the first operational unit is equipped with its weapons and capable of carrying out an attack.

Maximum Operational Range (n.m.)—

(Air-to-Surface Systems)—Slant range between the launching aircraft and the target at the time of missile launch.

(Surface-to-Surface Systems)—Maximum range under operational conditions with warhead weight indicated. In the case of ballistic missiles the maximum range figures disregard the effect of the earth's rotation.

Reaction Time—The time required to launch from a given readiness condition. The time required is a function of the type of system, the mode of deployment (i.e., hard or soft), and the checkout procedures used.

Refire Time—The time required to launch a second missile from the same launcher.

RE-ENTRY VEHICLES AND WARHEADS

Re-entry Vehicle (RV)—That part of a missile which carries the warhead and is designed to survive re-entry into the earth's atmosphere and detonate on target.

Multiple Independently-targetable RVs (MIRVs)—Two or more RVs in a single missile payload package, with each RV capable of being directed at a separate aiming point.

Maneuverable RV (MaRV)—An RV which has the capability to maneuver during free flight or re-entry.

Multiple RVs (MRVs)—Two or more RVs in a single missile payload package. The individual RVs are dispersed but not independently-targeted or maneuvered.

Retrofire—A technique whereby the RV is deorbited or is deboosted out of a normal ballistic trajectory.

Ballistic Coefficient (beta)—An RV characteristic whose value is a function of the RV weight and shape and is defined as the weight of the RV divided by its drag coefficient and area. The speed with which an RV passes through the atmosphere increases as the ballistic coefficient increases. An RV having a higher ballistic coefficient is less susceptible to the re-entry error induced by the effects of wind and density in the atmosphere. Re-entry vehicles with lower ballistic coefficients are less susceptible to the effects of prior nuclear bursts in the impact area, e.g., wind, dust, debris; are more adaptable to hardening against the radiation effects of attacking ABMs; and facilitate the design and packaging of nuclear weapons.

Warhead Weight—The weight of the nuclear system of an explosive device and of its safing, arming, fuzing, and firing mechanism.

RV Weight—The weight of the warhead plus necessary shielding and structure, of any internal penetration aids that may be present, and of any other necessary or desired components of the RV including hardening.

Throw Weight—The weight of that part of the missile above the last booster stage. In the case of MIRVs or MRVs, for example, throw weight would include the weight of

the MIRV or MRV release mechanism as well as that of the RVs.

RELIABILITIES

Force Reliability—The percentage of the operational missile force that, in the absence of countermeasures, will successfully detonate in the target area. This is the product of alert rate and weapon system reliability.

Weapon System Reliability—The percentage of the alert missiles that will successfully detonate within 3.5 CEPs of their targets. This is the product of launch, in-flight, and warhead reliabilities.

[Reverse blank]

ANNEX B

ESTIMATED CHARACTERISTICS AND PERFORMANCE OF SOVIET INTERCONTINENTAL WEAPON SYSTEMS

[Reverse blank]

TABLE I

CURRENT SOVIET INTERCONTINENTAL BALLISTIC MISSILE SYSTEMS
ESTIMATED CHARACTERISTICS AND PERFORMANCE

	SS-7			SS-8	SS-9					SS-11			SS-13
	Mods 1 & 2		Mod 3		Mod 1	Mod 2	Mod 3 As DICBM	Mod 3 As FOBS	Mod 4 [a] (3 RVs)	Mod 1	Mod 2 Type A	Mod 2 Type B (3 RVs)	
IOC	1962/1963		1963	1963	1967	1966	[b]	[b]	Probably 1971	1966	1971	1971	1969 Mod 1 Late 1971-1972 Mod 2
Maximum Operational Range (NRE-nm) [c]	6,500		5,500	6,000	7,000	[d]	About 6,000	N/A	5,500	5,500	6,000	6,000	[e]
Re-entry Vehicle Weight (pounds)	3,500 ± 500		4,200 ± 500	3,500 ± 500	9,500 ± 750	13,500 ± 1,000	3,000-4,000	3,000-4,000	Each RV About 3,000-3,200	About 1,500 [f]	About 1,500 [f]	Each RV 500-750 [f]	About 1,000 (both Mods)
Nuclear System Weight [g]	2,250-2,800		2,750-3,350	2,250-2,800	6,150-7,600	8,800-10,800	1,950-3,200	1,950-3,200	Each RV About 1,950-2,550	About 975-1,200	About 975-1,200	Each RV 325-500	About 650-800
Yield (MT)													
Accuracy (CEP-nm)	1.0-1.25		1.0-1.25	1.0	[h]	[h]	1-2	1.5-3	[h]	About 1	0.6-0.7 [i]	0.6-0.7 [i]	1.0-1.5
Deployment Mode	Soft/Hard		Soft/Hard	Soft/Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard
Reliability (percent)													
Weapon System	80		80	65	85	85	75	75	80	85	85	85	85
Alert Rate	85		85	85	90	90	90	90	90	90	90	90	90
Force [j]	70		70	55	75	75	70	70	70	75	75	75	75
Launch Facility Hardness (PSI) Against a 1 MT Weapon [k]													
Silo	500		500	Not Computed	500	500	500	500	500	700	700	700	900
LCC	N/A		N/A	N/A	400	400	400	400	400	400	400	400	1,300
Time to Fire (minutes)	Soft / Hard		Soft / Hard	Soft / Hard									
Normal Readiness	60-180 / 5-15		60-180 / 5-15	60-180 / 30-45	3-5	3-5	3-5	3-5	3-5	0.5-3	0.5-3	0.5-3	0.5-2
Peak Readiness	3-5 / 3-5		3-5 / 3-5	5-10 / 5-10	3-5	3-5	3-5	3-5	3-5	0.5-3	0.5-3	0.5-3	0.5-2
Hold Time (Peak Readiness)	Many Hours / Days		Many Hours / Days	About 1 Hour / About 1 Hour	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Refire Time	2-4 Hours		2-4 Hours	2-4 Hours	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Configuration	Two-Stage		Two-Stage	Two-Stage	Two-Stage	Two-Stage	Two-Stage Plus Deboost/ Deorbit Stage	Two-Stage Plus Deboost/ Deorbit Stage	Two-Stage	Two-Stage	Two-Stage	Two-Stage	Three-Stage
Gross Lift-off Weight (pounds)	325,000		325,000	165,000	400,000	400,000	400,000	400,000	400,000	100,000	110,000	110,000	100,000
Guidance	Inertial		Inertial	Radio-Inertial	Inertial	Inertial	Inertial	Inertial	Inertial	Inertial	Inertial	Inertial	Inertial
Propellant	Storable Liquid		Storable Liquid	Non-Storable Liquid	Storable Liquid	Storable Liquid	Storable Liquid	Storable Liquid	Storable Liquid	Storable Liquid	Storable Liquid	Storable Liquid	Solid

[a] See statements of various views on the SS-9 Mod 4 in paragraph 52 of text.

[b] The SS-9 Mod 3 is believed to have achieved IOC in late 1969, but it is not known whether it is intended to be used as a DICBM or a FOBS.

[c] With the exception of the SS-9 Mods 2 and 3, and the SS-13, maximum ranges have been determined by optimizing the flight profiles and rounding off to the nearest 500 n.m. Since the SS-9 Mod 3 as a DICBM flies a depressed trajectory, its flight profile cannot be optimized, and the range given is based on that which has been demonstrated. For a discussion of how the range of the SS-9 Mod 2 and the SS-13 were arrived at see paragraphs 16-22 and 75 of text.

[d] See discussion in paragraphs 16-22 of text regarding the range of the SS-9 Mod 2.

[e] See paragraph 75 of text.

[f] See footnote 17 of text.

[g] Except for the SS-9 Mod 3, the SS-9 Mod 4, and the SS-11 Mod 2 Type B, these nuclear system weights represent 65-80 percent of the *mid-point* of the range shown for RV weights and are rounded. This spread reflects our uncertainty as to how much of a Soviet RV package is devoted to such things as casing, heat shield, etc. In the case of the SS-11 Mod 2 Type B, because of the small size of the RV we have used only 65 percent as nuclear system weight. The percent of the RV that comprises the nuclear system is a function of weight of the RV; the lighter the RV the less percent that can be allocated to the nuclear system, and vice versa. For the SS-9 Mod 3, the SS-9 Mod 4, and the SS-11 Mod 2 Type B we have allowed the uncertainty in the RV weight to affect the calculation of the nuclear system weight.

[h] See statements of various views on the accuracy of the SS-9 Mods 1, 2, and 4 in paragraph 30 of text.

[i] CEP value is for the Mod 2 Type A RV and the centroid of the Mod 2 Type B impacts.

[j] These reliabilities represent a day-to-day posture. In the case of a generated alert condition, Force Reliability could be improved up to 5 percent by increasing the Alert Rate.

[k] The figures given represent the overpressure that would render 50 percent of the targets inoperable.

TABLE II

SOVIET SUBMARINE-LAUNCHED BALLISTIC MISSILE SYSTEMS
ESTIMATED CHARACTERISTICS AND PERFORMANCE

	SS-N-5	SS-N-6	SS-NX-8
IOC	1963	1968-1969	[a]
Maximum Operational Range (NRE-nm)	700	1,300	About 3,000
Type and Propulsion	Single-stage ballistic, storable liquid	Single-stage ballistic, storable liquid	Two-stage ballistic, storable liquid
Guidance	Inertial	Inertial	Inertial [b]
Re-entry Vehicle Weight (pounds)	2,800±500	About 1,500	1,500-2,000 [b]
Nuclear System Weight (pounds)[c]	1,800-2,250	975-1,200	975-1,600
Yield (MT)	[		]
System CEP (nm)[d]	1-2	About 0.7	About 0.75
Missile CEP (nm)	About 1	About 0.4	About 0.5
Launch Mode	Submerged	Submerged	Submerged
Reliability (percent)[e]			
Weapon System	80	80	About 80
Alert Rate	95	95	About 95
Force	75	75	About 75
Salvo Time [f]			
Class / Number of Missiles			
H-II, G-II / 3	6 Minutes	—	—
Y / 16	—	3-5 Minutes	—
Time to Fire [g]			
From Normal Readiness	15-20 Minutes	15-20 Minutes	15-20 Minutes
From Peak Readiness	6-8 Minutes	About 1 Minute	About 1 Minute
Hold Time (peak readiness)	About 1 Hour	About 1 Hour	About 1 Hour

[a] The SS-NX-8 could be ready for deployment by late 1972, but weapon system IOC would depend upon the availability of a launch platform.

[b] See discussion of the SS-NX-8 in paragraphs 110-112 of text.

[c] Based on analogy with US systems, these nuclear system weights represent 65-80 percent of the *mid-point* of the range shown for RV weights, and are rounded. This spread reflects our uncertainty as to how much of a Soviet RV package is devoted to such things as casing, heat shield, etc.

[d] System CEP includes both missile errors and submarine position-location errors.

[e] Pertains only to submarines on patrol.

[f] Time from launch of first missile until all missiles are launched.

[g] Time required to proceed from a specified readiness condition to launch, after receipt of order to fire.

Ep. 98 blanket

TABLE III

SOVIET BALLISTIC MISSILE SUBMARINES
ESTIMATED CHARACTERISTICS AND PERFORMANCE

Class	Maximum Speed Submerged (knots)	Approximate Shaft Horsepower	Number Screws and Turns Per Knot	Diving Depth * Normal Operations (feet)	Collapse Depth (feet)	Length (feet)	Beam (feet)	Displacement (tons)	
								Surfaced	Submerged
Y.....	30	60,000	2 9.5	1,300	2,000	425	38	7,500	9,400
H-II.....	26	30,000	2 19.5	1,000	1,500	380	30	4,900	5,900
H-III.....	24	30,000	2 21	1,000	1,500	425	30	5,500	6,400
G-III.....	12	5,100	3 Unknown	1,000	1,500	370	30	2,650	3,250

* Normal operating depth limit is defined as the depth to which a submarine may proceed an unlimited number of times. During emergencies, a submarine may exceed this depth to an indeterminate point approaching collapse depth and still survive.

TABLE IV

SOVIET BALLISTIC MISSILE SUBMARINES
ESTIMATED CHARACTERISTICS AND PERFORMANCE

Class	Patrol Characteristics			Missiles				Torpedoes		Navigational Accuracy
	Normal [a] Duration (days)	Average Transit Speed (knots)	Patrol Speed (knots)	Type	Number	Estimated Range (nm)	Total Salvo Time	Number	Type	
Y	60	12 [b]	5	SS-N-6	16	1,300	4-5 min	18	Various	0.2 nm
H-II	60	12 [c]	5-6	SS-N-5	3	700	6 min	22	Various	0.5 nm
H-III	60	12 [c]	5	SS-NX-8 [d]	6	3,000	Unknown	22	Various	0.2 nm
G-III	60	5	6 [e]	Unknown	See Text	Unknown	Unknown	22	Various	Unknown

[a] Patrol duration is defined as the normal length of time that a submarine will remain at sea without replenishment under combat conditions. It is estimated on the basis of crew endurance, general habitability, and consumption of food, spare parts, and other consumables including fuel. Extended patrols can exceed this length of time.

[b] The Y-class has been noted to use an average speed of eight knots while transiting straits, choke points and the GI/UK gap. A 12-knot speed is expected for the remainder of the transit.

[c] The H-class is usually expected to shift to the turbo-electric mode of propulsion and slow to about 6-8 knots during transits of restricted passages.

[d] See paragraphs 110-112 of text for a discussion of the SS-NX-8.

[e] With snorkel.

TABLE V

KANGAROO AS-3 AIR-TO-SURFACE MISSILE SYSTEM ESTIMATED CHARACTERISTICS AND PERFORMANCE

IOC	1960–1961
Maximum Range.....	350 nm (Mach 1.8 at altitude of 55,000 feet)
Nuclear System Weight	4,500–5,500 pounds
Yield.....	[redacted]
Accuracy (CEP).....	1–3 nm
Carrier Aircraft/Number of Missiles	Bear/1

TABLE VI

SOVIET STRATEGIC BOMBERS
ESTIMATED PERFORMANCE UNDER AN OPTIMUM MISSION PROFILE

Model	IOC	Gross Weight (pounds)	Speed (knots)/Altitude (feet)		Combat Ceiling (feet)	Payload (pounds) Bombs or Missiles	Radius/Range (nm)[a]		System Reliability (percent)[b]
			Over Target or ASM Launch	Maximum			High Altitude Unrefueled	Subsonic One Refuel	
Bison.......... (3-M)	1958	400,000	465/43,000	540/18,000	46,100	25,000	2,800/5,200	3,950/7,300	79–85
						10,000	3,050/5,950	4,150/7,900	
						6,600	3,100/6,050	4,200/8,100	
						3,300	3,150/6,150	4,250/8,250	
Bear A......... (TU-95)	1956	365,000	435/42,000	500/25,000	40,300	25,000	4,150/7,800		79–85
						10,000	4,500/8,800		
						6,600	4,600/9,000		
						3,300	4,700/9,300		
Bear B......... (TU-95)	1960	365,000	430/36,000–39,000	500/25,000	41,000	One AS-3 (25,000)	3,950/7,150	5,050/9,200	59–64

[a] The range and radius figures given in this Table are maximum figures. They are applicable to the most up to date models of these aircraft, flying optimum mission profiles.

[b] These reliabilities are based on the following non-combat attrition rates: (1) 90 percent of the aircraft assigned to home base would be in commission after a 5–10 day standdown prior to initial operations, and would become airborne at launch time; (2) 94 percent of the aircraft airborne would reach the bomb release line directly from home base or from staging base; (3) 95 percent of those aircraft which deploy from home bases to staging bases will successfully launch from the staging base; (4) the reliability rates also assume additional degradation for those requiring in-flight refueling to accomplish their mission; a 98 percent reliability is applied to aircraft equipped with probe and drogue; a 95 percent reliability is applied to aircraft employing wing-tip to wing-tip refueling. The low side of the range given assumes all aircraft are staged and refueled in flight; the high side assumes no aircraft are staged or refueled in flight. These reliability rates may be high, since the effects of Soviet operational concepts and troop-training standards are at least as important as technical characteristics in determination of system reliability, and we have no reliable basis for estimating these effects.

CENTRAL INTELLIGENCE AGENCY

DISSEMINATION NOTICE

1. This document was disseminated by the Central Intelligence Agency. This copy is for the information and use of the recipient and of persons under his jurisdiction on a need-to-know basis. Additional essential dissemination may be authorized by the following officials within their respective departments:

a. Director of Intelligence and Research, for the Department of State
b. Director, Defense Intelligence Agency, for the Office of the Secretary of Defense and the organization of the Joint Chiefs of Staff
c. Assistant Chief of Staff for Intelligence Department of the Army, for the Department of the Army
d. Assistant Chief of Naval Operations (Intelligence), for the Department of the Navy
e. Assistant Chief of Staff, Intelligence, USAF, for the Department of the Air Force
f. Director of Intelligence, AEC, for the Atomic Energy Commission
g. Assistant Director, FBI, for the Federal Bureau of Investigation
h. Director of NSA, for the National Security Agency
i. Director of Scientific Intelligence, CIA, for any other Department or Agency

2. This document may be retained, or destroyed by burning in accordance with applicable security regulations, or returned to the Central Intelligence Agency by arrangement with the Office of Scientific Intelligence, CIA.

3. When this document is disseminated overseas, the overseas recipients may retain it for a period not in excess of one year. At the end of this period, the document should either be destroyed, returned to the forwarding agency, or permission should be requested of the forwarding agency to retain it in accordance with IAC-D-69/2, 22 June 1953.

4. The title of this document when used separately from the text should be classified: ~~SECRET~~

DISTRIBUTION:
White House
National Security Council
Department of State
Department of Defense
Atomic Energy Commission
Federal Bureau of Investigation

~~TOP SECRET~~
~~Controlled Dissem~~
~~Limited Distribution~~

~~TOP SECRET~~