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Submitted by the
DIRECTOR OF CENTRAL INTELLIGENCE

The following intelligence organizations participated in the preparation of this paper: The Central Intelligence Agency and the intelligence organizations of the Departments of State, Defense, the Army, the Navy, the Air Force, The Joint Staff, and AEC.

Concurred in by the
UNITED STATES INTELLIGENCE BOARD

on 9 November 1961. Concurring were the Director of Intelligence and Research, Department of State; The Director, Defense Intelligence Agency; the Assistant Chief of Staff for Intelligence, Department of the Army; the Assistant Chief of Naval Operations (Intelligence), Department of the Navy; the Assistant Chief of Staff, Intelligence, USAF; the Director for Intelligence, Joint Staff; the Director of the National Security Agency, and the Atomic Energy Commission Representative to the USIB. The Assistant Director, Federal Bureau of Investigation, abstained, the subject being outside of his jurisdiction.

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CENTRAL INTELLIGENCE AGENCY

9 November 1961

SUBJECT: INTELLIGENCE ASSUMPTIONS FOR PLANNING: SOVIET ICBM
SITES, 1961-1967

THE PROBLEM

To provide coordinated intelligence assumptions for planning, as to numbers of operational ICBM launching facilities in the USSR from the present to 1967. Further, to provide assumptions regarding the general configurations of such launching facilities, with special attention to hardening as a means of protection.

FOREWORD

1. This paper is submitted in response to the specific requirement of the Joint Chiefs of Staff for an estimate on numbers of Soviet ICBM sites to 1967, with special attention

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to hardened sites (see USIB-D-13.1/10, 23 October 1961). In recent NIE's we have pointed out that the inadequacy of our evidence, the rapidity of technological change and the other uncertainties surrounding both Soviet and US planning make it impossible to project a detailed national estimate on such a subject for more than a few years into the future. These coordinated Intelligence Assumptions for Planning rest largely on inference and deduction from general considerations, rather than on an evidential base. Because of the limited purpose of this paper, distribution of it beyond the membership of the USIB will be limited to accord with the wishes of the Joint Chiefs of Staff.

2. In order to support and clarify the assumptions about the numbers of Soviet ICBM sites, estimates and assumptions about the general configurations and operational characteristics of the launching facilities are also included.

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THE ASSUMPTIONS

Launching Facilities to Mid-1963

1. Sufficient evidence is available on Soviet ICBM R&D and deployment programs to justify an estimate, rather than only an assumption, of numbers of operational launchers to mid-1963, and to provide a general description of the launching facilities. Present types of launchers are fixed, and are grouped into large, soft, rail-served complexes. These complexes contain housing, maintenance, handling, and other facilities in a central support area, as well as launchers designed to employ liquid fueled missiles. Each complex probably has sufficient missiles to provide a reload capability and to fire additional missiles after a period of some hours. Although they are protected from ground observation by deployment in remote, densely wooded areas, and from aerial attack by surface-to-air missiles, existing complexes are highly vulnerable to overhead reconnaissance and to nuclear weapon effects.

2. The bulk of the force to mid-1963 will be deployed with road-served pairs of launchers, each pair having adjacent buildings for checking out and holding missiles in a

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horizontal position. The launchers in a pair are some 1,200 feet apart; the pairs are dispersed some 3-5 n.m. from each other and some 5-10 n.m. from the main support area of the complex. Complexes are believed to contain an average of eight launchers in four pairs.

3. Because of uncertainties as to detailed characteristics of the new ICBMs being tested and as to the pace and degree of success of the accelerated R&D program now under way, we cannot determine when in 1962 a second generation ICBM system will have been proved ready for operational deployment. For purposes of this paper, we assume that operational second generation missiles will be available for a few completed launching complexes by mid-1962. On this basis, the numbers of operational ICBM launchers estimated in the recently-completed NIE 11-8/1-61, "Strength and Deployment of Soviet Long Range Ballistic Missile Forces," dated 21 September 1961, can be summarized by mid-years as follows:

	<u>SEPTEMBER 1961</u>	<u>MID-1962</u>	<u>MID-1963</u>
Soft Launchers ^{1/ 2/} (First and Second Generation ICBMs)	10-25	25-50	75-125

(Footnotes on next page)

4. Deployment levels of the Soviet ICBM force in years subsequent to 1963 will be determined by the interaction between what the Soviet leaders desire to do and what they prove able to do. It is not possible to estimate with confidence for the years beyond 1963 which decisions the Soviets will make regarding ICBM deployment, and it is at least as difficult to estimate the likely rate of progress in the several elements of their development program.

Policy Decisions

5. Soviet decisions in three crucial areas will be key determinants in establishing ICBM force goals in the years 1963-1967. These are: (a) the strategic concepts to be adopted in the employment of Soviet long-range striking forces, particularly ICBMs; (b) the deployment concepts to be adopted for the ICBM force (i.e., hardening, dispersal,

1/ Included are a few launchers at the Tyuratam test range, which we assume would be employed against the US in the event of war. This number may reach 10 or so over the next few years.

2/ The Assistant Chief of Staff, Intelligence, USAF, estimates the numbers of operational ICBM launchers for this period as follows:

<u>MID-1961</u>	<u>MID-1962</u>	<u>MID-1963</u>
50	100	250

etc.); and (c) the role of an anti-ICBM system which will probably become operational during this period. An unexpected Soviet technological breakthrough could affect these decisions, but such an eventuality cannot by its very nature be taken into account in our assumptions.

6. Strategic Concepts. The Soviets would consider broad strategic concepts along the following general lines:

a. An ICBM capability designed to attack hardened US ICBMs in addition to the other fixed bases of the US nuclear force.

Calculations of theoretical ICBM force requirements to attack all the hardened and unhardened US ICBM sites programmed for the 1963-1967 period indicate that missiles numbering in the thousands would be necessary to support such a mission. We think it is extremely unlikely that the Soviets will undertake such a program because of the great uncertainties inherent in such a strategy, the physical difficulties of deploying such a force in a short period of time, and the tremendous expenditure of resources it would require.

b. An ICBM capability designed to destroy soft and semihardened fixed US strategic installations, including SAC bomber bases, ICBM sites, and communications and control facilities.

Calculations of theoretical requirements indicate that with 200-400 ICBM launchers, the Soviets could have high assurance (70-90 percent) of destroying US SAC bomber bases and other soft and semihardened military installations programmed for this period. We have previously estimated that Soviet ICBM force goals would be established with the aim of achieving a force of this general order of magnitude. It is possible that the Soviets will continue with this concept beyond 1963, even though confronted with a large and rapidly growing number of hardened and submarine-launched US missiles, on the basis that it will remain militarily useful to have a capability to destroy those more vulnerable targets associated with US nuclear delivery capabilities. Also, while

retaining this concept, the Soviets might undertake a further increase of the ICBM force, in order to permit attacks on some hardened US targets or to insure the retention of a substantial residual striking capability after a US attack.

c. An ICBM capability designed to attack major US population and industrial centers.

We have estimated that the Soviets already possess a capability for bringing a number of major US cities under ICBM attack. We have pointed to the large numbers of MRBMs the Soviets can bring to bear against Eurasian targets, thus making it possible, not only to attack military targets within range, but also, as Khrushchev has asserted, to hold Europe "hostage." A Soviet ICBM force geared primarily to this concept would not require a substantial enlargement beyond the 1963 level. Even under this concept, however, the Soviets would probably wish to add to their retaliatory capability by such

means as increasing the survivability of their ICBM force and deploying some specialized ICBMs designed to deliver warheads in the 50-100 MT range.

7. Deployment Concept. We have estimated that the ICBM force through 1963 will be unhardened and vulnerable to overhead observation. The continued growth of US strategic capabilities in the years after 1963, a large part of which will be in hardened and submarine-launched missiles, will bring pressure to bear on the Soviets to increase the survivability of their own force. Soviet concern over US intelligence efforts, including their public charges that the US plans overhead reconnaissance, will add to this pressure. Some hardening or other protection for the bulk of the force would therefore be required. Moreover, the Soviets would almost certainly find it highly desirable to deploy at least a small number of hard ICBMs (100 psi or more) in order to support any of the strategic concepts described above.

8. In addition, the Soviets may be able later in the period to deploy some number of ICBMs with very large warhead yields (50-100 MT). This number is not likely to be large whether it is to be used for military tasks or is intended mainly to support deterrence and psychological warfare.

9. Role of the Anti-ICBM. The Soviet assessment of the probable effectiveness of their AICBM and its future role in their balance of forces could exercise a major influence in determining force levels after 1963. To the extent that the Soviets believe their AICBM defenses could cope with US missiles, this would tend to lower their requirement to build ICBMs for accomplishing a given strategic objective. It is more likely, however, that the Soviets will not achieve high confidence in the effectiveness of their AICBM defense capability during this period. Considering the range of our 1963-1966 estimate of IOC date, it is even possible that Soviet AICBM capabilities will have very little effect on the structure of their other forces during the period covered by these assumptions. Finally, US progress in AICBM defense will at some point push Soviet ICBM requirements upwards, but we believe that this is unlikely to have a significant effect on Soviet programs through 1967.

Development and Deployment Aspects

10. The actual structure of Soviet ICBM forces beyond 1963 will depend, not only on the factors described above, but also on the Soviet capacity to deploy existing systems

and to develop and deploy new or modified systems during this period. Existing ICBM systems will continue to have utility throughout the period. They will remain well suited to attacking large, soft targets such as cities and air bases. Significant improvements in accuracy, and warhead yields on the order of 20-30 MT, could appear in the next few years. Such improvements would increase the suitability of these weapons for attacking hardened command centers and some types of hardened ICBM sites.

11. A second important developmental factor, which might affect the number of Soviet ICBM launchers as well as their vulnerability, is the Soviet capacity to provide passive protection for the force. This could involve hardening (to 100 psi or more), semihardening (on the order of 25 psi), or various schemes for concealment and dispersal. In our view, it is highly unlikely that the soft complexes now operational or under construction can be substantially hardened. It is possible that second generation ICBMs have storable fuel and all-inertial guidance, and it may be technically feasible for the USSR to deploy such missiles in fully hardened, silo-type facilities at a later date. However, we believe that deployment in silos would require extensive redesign of the

horizontal handling and checkout facilities associated with second generation systems, and that the Soviets are unlikely to adopt this type of deployment for these relatively large systems. It is much more likely that full hardening will await a new system designed specifically for this type of deployment. Soviet development of such a system would probably not result in any operational capability before 1965 or 1966.

12. Second generation complexes which become operational after 1963 could incorporate a modified concept, less vulnerable to US intelligence collection or nuclear attack or both. A semihard concept involving protection of missile handling and checkout facilities against overpressures on the order of 25 psi, but associated with soft launch pads, could be evolved for second generation ICBMs. This would be designed to provide protection except during the period required to prepare the launcher, move the missile to the pad, fuel it, and fire it. The period involved would probably be several hours. Another method would be greater dispersal than is now the practice, with launchers deployed singly rather than in pairs. We believe it prudent to assume that virtually all second generation launchers activated in 1964 and after will

be protected by dispersal and possibly by use of the semi-hard concept as well. Soviet cities would almost certainly have priority for deployment of any AICBM defenses available through 1967, but some ICBM launching facilities may be deployed close enough to such cities to share this protection.

13. We believe it reasonable to assume that, in a vigorous but efficient program lasting over a period of several years, the USSR could deploy second generation ICBM launchers in soft complexes at a rate averaging some 100 and possibly as many as 150 launchers per year, beginning in about 1963.^{3/} Semihardening of dispersal would require a considerable increase in the allocation of resources, as would the concurrent deployment of a new, fully-hardened system. The adoption by the Soviets of a hard deployment concept may tend to lower the numbers for later years because of the increased time and effort involved in development and construction.

^{3/} The Assistant Chief of Staff, Intelligence, USAF, believes it reasonable to assume that the rate could be on the order of 200 per year.

14. Various means of concealment and deception might be employed in conjunction with the methods of protection described above. Complete concealment against overhead observation is unlikely because of the difficulty of concealing large-scale construction projects of 18-24 months' duration. However, US intelligence and targeting problems could be compounded by various forms of camouflage and deception.

15. We believe that the Soviets would not find it practical to make a large, liquid-fueled ICBM system rail-mobile. It is unlikely that they will have developed and deployed a rail or road-mobile, solid-fueled system by 1967.

Assumed Numbers of Launchers

16. On the basis of the foregoing considerations, it is possible to construct combinations of Soviet policy decisions and technology which would result in high and low sides of a range within which we assume the ICBM force level will fall. In both cases we assume that virtually all launchers becoming operational after 1963 will be protected by such means as greater dispersal and possibly semihardening, and that towards the end of the period a fully hard system will enter operational service. Within the range assumed,

there would undoubtedly be some tradeoff between numbers of launchers and degree of protection provided by hardening, but we can provide no quantitative measure of this relationship.

a. High Side. An ICBM force of 650^{4/} operational launchers in 1967 can be assumed on the basis of a Soviet decision to build a relatively large force, in order to avoid an extreme numerical inferiority in ICBMs, to possess an attack capability against soft and semihard US targets and possibly against some types of hard targets as well, and to buy numerical insurance of a residual second strike capability. It would involve a vigorous construction program for launchers and an early and successful program to develop and deploy a new, fully-hardened system. The high side would be consistent with a Soviet force structure in which the AICBM program would have little effect on the ICBM force level.

b. Low Side. An ICBM force of some 350 operational launchers in 1967 can be assumed on the basis of a

^{4/} The Assistant Chief of Staff, Intelligence, USAF, calls attention to his footnote to the table following the text.

Soviet decision that a smaller number of operational launchers would comprise an adequate deterrent and emergency capability against US cities as well as soft and semihard targets, and that protection and concealment of Soviet launchers would insure a sufficient second-strike residual. It could result in part from less urgent or less successful development of a fully-hardened system. The low side would be consistent with an early beginning of the AICBM program and a heavy commitment of Soviet resources to it, in which case the Soviet leaders might regard their AICBM capability as offsetting a large US numerical superiority in ICBMs.

17. High and low assumptions respecting operational ICBM launchers are presented below by mid-years. The table does not specify very high-yield warheads, which are likely to be provided for some number of the larger ICBMs during the period, most of them on soft launchers. In considering the implications of the numbers shown in the table, it should be kept in mind that more than one missile will probably be available for each of the soft and semihardened launchers.

ASSUMED NUMBERS OF OPERATIONAL
ICBM LAUNCHERS, 1961-1967^{5/}

	<u>SEPTEMBER</u> <u>1961</u>	<u>MID-</u> <u>1962</u>	<u>MID-</u> <u>1963</u>	<u>MID-</u> <u>1964</u>	<u>MID-</u> <u>1965</u>	<u>MID-</u> <u>1966</u>	<u>MID-</u> <u>1967</u>
<u>High Side</u>							
Soft launchers ^{a/}	25	50	125	150	150	150	150
Dispersed, possibly semihardened ^{b/}	--	--	--	125	250	325	400
Hardened ^{c/}	--	--	--	--	a few	50	100
TOTAL	25	50	125	275	400	525	650
<u>Low Side</u>							
Soft launchers ^{a/}	10	25	75	100	100	100	100
Dispersed, possibly semihardened ^{b/}	--	--	--	50	125	200	200
Hardened ^{c/}	--	--	--	--	--	a few	50
TOTAL	10	25	75	150	225	300	350

a/ First and second generation ICBMs.

b/ Second generation ICBMs.

c/ New, fully-hardened ICBMs.

5/ The Assistant Chief of Staff, Intelligence, USAF, believes that the "High Side" approximates the most probable Soviet deployment program. Recalling his estimate on deployment in the period through mid-1963 (page 5) he would point out, however, that comparable differences prevail through mid-1967. Finally, the Assistant Chief of Staff, Intelligence, USAF, believes that the number of new, fully-hardened launchers would be larger than indicated in the "High Side."