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" Briefing for Preparedness investigating Subcommittee of the Armed Services Committee of the Senate on Soviet Guided Missiles and Related Soviet Capabilities."

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TOP SECRET

CENTRAL INTELLIGENCE AGENCY

OFFICE OF THE DIRECTOR

2 December 1957

MEMORANDUM FOR:

Colonel Robert Cushman
Office of the Vice President

Bob:

Attached is copy #16 of the Director's briefing for the Preparedness Investigating Sub-Committee of the Senate. It should be noted that the questions and answers in connection with this briefing are not included since we have just received a transcript from the Committee.

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[redacted]
Executive Officer 25X1

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25X1 [redacted] dtd 26-27 Nov 1957

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Distribution: 30 Nov 57

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BRIEFING FOR PREPAREDNESS INVESTIGATING SUBCOMMITTEE

OF THE ARMED SERVICES COMMITTEE OF THE SENATE

ON

SOVIET GUIDED MISSILES AND RELATED SOVIET CAPABILITIES

Presented by the Director of Central Intelligence and by Dr. Herbert Scoville, Assistant Director for Scientific Intelligence, C. I. A., on 26 and 27 November 1957.

INTRODUCTION

1. The purpose of this presentation is to furnish an analysis of our current assessments of Soviet guided missiles capabilities and intentions and to review some of the basic economic and scientific factors which underlie Soviet technological strength. In addition, current estimates of Soviet bomber and submarine strengths will also be reviewed. The majority of this material will be based on the US intelligence community's latest National Intelligence Estimates. Where recent intelligence developments have overtaken our community estimative process, I will so indicate and give you the current status of our intelligence assessments.

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2. The intelligence community includes the intelligence organizations of the Departments of State, Army, Navy and Air Force, Joint Chiefs of Staff, Atomic Energy Commission, Federal Bureau of Investigation, and the Central Intelligence Agency. The C.I.A. has the coordinating responsibility in the field of national intelligence.

3. Today, I myself will cover the general industrial and scientific capabilities of the Soviet Union and give a general summary of the Soviet guided missile program. Dr. Scoville, head of the Office of Scientific Intelligence in the C.I.A., will cover the details of the Soviet missiles program, and there will be a brief review of Soviet bomber and submarine forces.

GENERAL ECONOMIC BACKGROUND

4. The Soviet economy, though much smaller than that of the USA, has been growing faster than the US, and Soviet production of military goods and services is roughly equal to that of the US. This is due to the high priority accorded

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by Soviet leaders to heavy industry and to military production--as instruments of national power. A major difference between the two economies has been the far greater extent to which US resources are allocated to consumption.

5. The US retains a significant lead in terms of the greater size of its economy. However, Soviet Gross National Product (GNP) has been growing at a rate of 7 percent annually. This was double the US rate of 3.5 percent annually. As a result, in dollar terms:

In 1950 Soviet GNP was 32 percent of that of the US

In 1956 it was 40 percent of that of the US

In 1962 we estimate Soviet GNP will be 45 percent of the US, given presently forecast slower rates of Soviet growth.

6. As to the Soviet allocation of available resources as compared with that of the US: --In 1956, with the equivalent of 40 percent of our resources in dollar terms:

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Soviet consumption was 25 percent of US consumption, Soviet investment was 55-60 percent of US investment, Soviet production of military goods and services was roughly the same magnitude as US defense production.

7. We have estimated that in 1957 Soviet defense expenditures are about 15 percent of GNP in terms of rubles. The comparable US figure is 9 percent of GNP in terms of dollars. Yet I wish to repeat that, despite our larger economy, the Soviets produce military goods and services with a dollar value roughly the same as the US. This is because: (a) in the USSR, military goods are less expensive than ours, relative to consumer goods, (b) the average level of real pay and subsistence for Soviet military personnel is much lower than in the US, and (c) production for direct or indirect military purposes is from the most efficient sector of the Soviet economy.

8. If our estimate of military trends is correct, Soviet defense expenditures will increase gradually, reaching in 1962

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a level 25 to 30 percent greater than at present, but consuming no greater proportion of GNP than at present. Most of this increase in defense expenditures will be in increased allocations to development and production of modern weapons systems.

9. The USSR is encountering growing difficulties in maintaining high levels of military expenditures and of investment in heavy industry. There are many reasons for these growing difficulties: One is that since Hungary more attention has had to be paid to consumer needs. Better living standards are being sought to stimulate higher productivity and to remove the stigma of poverty from Communism.

10. Greater priority is now focused on agriculture and housing. The major agricultural target is to reach American levels of per capita production of milk and meat. While these goals cannot be met, agricultural production, which had been lagging for many years, is now to be stepped up so as to increase faster than population.

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11. One difficulty being encountered by the USSR is the fact that for the near future the labor force will not grow as rapidly as before. This is especially true in the next five years as war-reduced age groups move into employment. Further, a greater share of investment must be directed to programs which do not provide immediately high returns in terms of additional production. These programs include expansion of the fuels and raw materials, where there has been a chronic lag in terms of the requirements for continued rapid growth.

12. Soviet leadership has attempted to deal with these problems by stressing greater efficiency, both of workers and of management. This has been behind the recent reorganization in the administration of the economy. There is room in the Soviet economy for gains in labor productivity and for better management. We believe the USSR will realize some of these gains. However, the impetus to growth obtained in this way will not entirely offset limitations in the labor supply and the higher cost of investments.

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13. Consequently, the rate of growth of the Soviet economy is slowing down. The burden of maintaining high defense expenditures, high investment in industry, and still improving the lot of the consumer has been recognized by some Soviet leaders. They superseded the Sixth Five-Year Plan (1956-1960) by a seven-year plan for 1959-65. The problem of competing priorities, however, is certain to cause continuing difficulty. Further retrenchments may have to be made, but we do not believe that these retrenchments will be at the expense of Soviet defense programs. Even at somewhat reduced rates of growth, the Soviet economy from its lower base will probably continue to grow faster than that of the US.

GENERAL SCIENTIFIC BACKGROUND

14. Soviet policy on science and technology is based upon a determination to accelerate the growth of the material and political strength of the Soviet Union with the specific aim of overtaking and surpassing the United States in both respects.

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The Soviet regime has considerable insight into the potentialities of science as an accelerator of technological progress and has accepted as axiomatic that generous support of both fundamental and applied science will lead to increased national strength.

15. The Soviet science program continues to be fed by the Soviet educational system, which is now outstripping that of the US in developing a scientific-technical manpower pool. You will hear of the Soviet education system from others. I should like to stress a few points which I consider fundamental to an understanding of their impressive surge in many fields of science. Every Soviet student by the time he finishes high school has had to take five years of physics, five years of biology, four years of chemistry, and ten years of mathematics. These are not electives - they are required subjects. This broad exposure to science during the formative years is an important contributing factor in the aptitude that Soviet young people display in

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science. (Sounded a public note of warning on this subject 2 1/2 years ago.)

16. After high school the better Soviet students enter higher educational institutions. Those with greatest aptitude are channeled into science courses generally in some relation to the Soviet need for certain skills by inducement in the form of propaganda, monetary inducements, prestige, or even the threat of the draft.

17. By systematic efforts, going back 20 years or more, the Soviet Union has now a total of 1.5 million college graduates trained and currently employed in scientific and technical fields. In the US, there are now 1.3 million similarly trained and employed. In the year 1957, the Soviet Union added 140,000 graduates in science and engineering, compared to only 100,000 in the US. Our rate of growth is thus appreciably lower and unless this trend can be reversed, which would be very difficult, if not impossible, within the next five years, the US will be

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placed in an increasingly unfavorable technological position vis-a-vis the Soviets.

18. As in the United States, scientific research in the Soviet Union is mostly in applied sciences. However, the importance of adequate fundamental research in the Soviet Union is well understood, and such work has been well supported. For example, the Academies of Sciences of the USSR and of the Union Republics, which employ about one tenth of the country's scientists, including many of world scientific prominence, concentrate on fundamental scientific problems. Great universities such as those of Moscow, Leningrad, and Kiev also conduct fundamental research. The Soviets have attached major value to fundamental science as a prestige element both at home and abroad.

19. Specific fields in which the Soviets have extensive and high quality fundamental scientific programs include mathematics, theoretical physics, high energy physics, solid

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state and low temperature physics, and geophysics. The Soviet Union has a very extensive and high-quality program in connection with the International Geophysical Year (IGY).

20. Currently, Soviet science is undergoing organizational changes in accordance with the law on economic reorganization adopted in May 1957. An objective of these changes is to achieve a well-balanced research effort as well as to increase still further that effort. An attempt will be made during the next five to ten years to guide fundamental research as much as possible into fields which may be expected to lead ultimately to application, although pure research of no foreseeable application will not be excluded. The changes being made are expected to result in an even stronger fundamental science program than has existed in the past.

21. In summary, all evidence suggests that the Soviets have realized the importance of science and research to their military and economic future. Also, in their development of highly skilled

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technicians, they are taking into account not only their own economy but supplying a large reservoir of skilled technicians which they can send as advisers to support their economic, industrial, and scientific programs of penetrations in the underdeveloped areas. They have approached the field of technological development with the attitude that this is a race against the US which they are determined to win. That such rapid changes in relative technological strength are possible was demonstrated in the thirties when, in a space of 10-15 years, the US moved from a position of scientific inferiority to one of overwhelming dominance in relation to Western Europe. The Soviets will endeavor to duplicate this feat vis-a-vis the US.

GUIDED MISSILES

22. The Soviet Union had no known guided missile program at the close of World War II but there can be no doubt of their great postwar interest in guided missiles. Situated as they are, they must view the ICBM as an ideal weapon. Immediately after

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World War II, they thoroughly and systematically exploited the German guided missile program. From this exploitation, the Soviets derived four general benefits: (a) operational and prototype missiles, with ranges up to 200 miles in the ballistic field, research and production facilities and equipment, and approximately 400 German missile specialists; (we got some specialists) (b) complete reports on German missile developments up to the war's end; (c) the familiarization of their personnel with German techniques of research, development, testing, and production of missiles and components, and (d) advanced technical studies and some development of hardware components, which German scientists performed in the Soviet Union to as late as about 1953.

23. As a result, the Soviet Union was able by 1948 to raise its guided missile knowledge to that which existed in Germany at the close of World War II. We believe that 1948 marks the beginning of a concerted and continuing native Soviet missile research and development program.

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24. This native Soviet effort is of great scope. Vigorous postwar scientific training programs have contributed large numbers of well-qualified scientists and engineers. Two test ranges with multiple launching platforms and with facilities for a great variety of testing and other developmental work have been established and are operating at a high pitch. In the shorter ranges, at least 300 ballistic missiles have already been test fired [redacted] 25X1

25X1 [redacted] The effort is largely concentrated on ballistic missiles but other categories have not been neglected as will be brought out later. 25X1

25. This extensive ballistic missile flight testing indicates an orderly, well conceived, and vigorously prosecuted program from which they have acquired a large amount of experience - experience which has aided them tremendously and will continue to be vital to the success of their earth satellite and ICBM programs and, of course, to their military deployment of missile systems.

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26. The industrial base and industrial experience in the Soviet Union can support series production of the missile systems which the scientists and engineers develop. There is one exception to this picture of great industrial strength as related to guided missiles and that lies in the field of electronics. We believe that, in view of competing demands, a limited availability of electronic equipment will seriously restrict the extent and variety of Soviet guided missile production, particularly in the mass-produced air defense missile categories, until about 1958. Thereafter, expanding electronic production will probably make this restriction much less severe.

27. The Soviet atomic energy program is progressing to the point where suitable nuclear warheads will doubtless be developed for missiles as required, though the availability of fissionable material will impose some limitations on the extent of Soviet nuclear warhead production between now and 1966. Production of warheads for ICBMs will not suffer, however, if sufficient

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priority is given to such warheads - which we believe will be the case.

28. Now, before we get down to the details, I should like to say a few words about how we make our estimates. As you well know, an effective security surrounds the entire Soviet military complex, and particularly around sensitive areas such as their guided missile program. While we have much hard evidence, we are seriously hampered in gathering intelligence about the details of specific missile systems. Therefore, in order to estimate particular capabilities in a field where positive intelligence is limited, we are forced to develop our estimates from: (a) all available evidence of Soviet missile activity, including their exploitation of German missile specialists and personnel; (b) general knowledge of the state of the art in the missile field, both in the Soviet Union and the US; and (c) known and estimated Soviet capabilities in related fields. Since it is likewise difficult to determine the scope of the Soviet missile program,

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we make an estimate of this on the basis of probable Soviet military requirements for missiles in relation to other military weapons systems.

29. The dates of availability of various missiles that you will be given this afternoon are the earliest probable years during which a limited number of missiles could have been serially produced and placed in the hands of trained personnel of one operational unit, thus constituting a limited capability for operational employment. It should be noted that an additional period of time, varying from a few months to several years depending on the missile system, would be required before we are faced with a major threat in terms of actual employment in a general war. Our current estimates are also based on the judgment that the Soviet Union does not now intend to initiate general war deliberately and is not now preparing for general war as of a particular date.

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30. Lastly, in viewing the Soviet missile program, it is important not to overlook the other elements of their military strengths - aircraft, naval forces, etc., or the possibility that the Soviets might desire to direct our attention so exclusively to military, missile, and nuclear matters that we would overlook their techniques of infiltration, subversion, and economic penetration. These latter today are their chief weapons in attempting to advance Soviet domination, particularly in what we call the undeveloped areas of the world, and in the former colonial areas.

And now, Dr. Scoville will present our detailed estimate of Soviet guided missile capabilities.

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OFFENSIVE MISSILE CAPABILITIES

A. Ballistic Missiles

31. The USSR has been engaged in an extensive ballistic missile research and development program. In 1947, a guided missile test range was established at Kapustin Yar (See Chart), and the Soviets, with German assistance, fired about 12 captured V-2 missiles in the fall of that year. Our evidence now indicates that a ballistic missile development program has been vigorously pursued since this date.

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32. Since mid-1953, at least 300 ballistic missiles have been flight-tested at Kapustin Yar.

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34. Our current estimates on the shorter-range ballistic missiles are as follows:

a. We estimate that the USSR could now have in operational use, surface-to-surface ballistic missiles with maximum ranges

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of 75, 200, 350, and 700 nautical miles, respectively. We have, however, no firm evidence of the operational deployment of any of these missiles.

b. We estimate that a ballistic missile of about 1,000-nautical-miles nominal range could be available for operational use in 1958. 25X1

25X1 Our current belief is that the USSR is probably temporarily satisfied with a 1,000 nautical mile ballistic missile as their "IRBM" and is placing top priority on achieving an operational ICBM.

35. Soviet ICBM and earth satellite activities have been the subject of much attention and our greatest concern during

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the past few months. Although the earth satellite is not presently a military weapon, Soviet activities in this field are extremely important for acquiring basic scientific data and for their propaganda value. Additionally, they provide us with indications of the developmental status of the Soviet ICBM. Today, I am considering the Soviet satellite program only in its relation to the ICBM program. The term ICBM as used herein does not connote a specific range, but does mean a range of 3,500 nautical miles or more, which is required to cover most targets in the US from bases in the USSR. 25X1

However, we have estimated for several years that an ICBM was probably a top-priority aim of the Soviet Union. A summary of evidence bearing on the ICBM question follows:

a. Soviet interest in the ICBM field has been evident since 1947 when Stalin stated that he wanted a weapon which could bombard New York.

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b. In 1951 a large rocket engine of about 220,000 pounds thrust was being fabricated. This engine could have been static tested in 1952 and ready for incorporation into a missile system in 1953. The thrust rating of this engine could have been increased by now and the coupling of two or more such engines is within Soviet capabilities, although we have no evidence that either advancement has been accomplished.

c. The existence of a new 3,500-nautical-mile ballistic missile test range has been firmly established. (See Chart). We believe that two ICBM vehicles have been flight tested on this range and that both Soviet satellites have been launched from here. The official Soviet announcement on 26 August of the successful test firing of an ICBM, and Mr. Khrushchev's statement [redacted] that he (Khrushchev) had personally witnessed the successful trial of the second Soviet ICBM on 7 September are further support of the two ICBM vehicle flight tests. The two satellites are conspicuous to the world; the

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first was orbited on 4 October with a reported weight of 185 pounds, and the second was orbited on 3 November with a reported weight of 1,120 pounds. At present, we do not doubt the reported weights or that a dog is carried in "Sputnik" number two.

d. Numerous public Soviet statements, official and unofficial, have been made in recent weeks regarding their ICBM and earth satellite activities and capabilities. Although these statements are too numerous to include, each is carefully evaluated in terms of our related evidence. I might say that the majority are aimed at reaping the maximum propaganda gain from their two satellite achievements.

37. An understanding of the relationship between the Soviet ICBM and earth satellite program is necessary to a full appreciation of Soviet ICBM capabilities. Our evidence clearly indicates that the Soviet earth satellite program is based upon usage of reliable military missile hardware. We believe that the Soviet earth satellite program developed concurrently with

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and was superimposed upon their ICBM program and that both programs are being prosecuted at extremely high priority - if not actually on a "crash" basis. We estimate that at least the first two stages of the launching vehicles for the two satellites were essentially the same and, further, that the first and second stages of the satellite launching vehicle are essentially the corresponding stages of their announced "ICBM." From known or estimated parameters, we can make extrapolations from their satellites to their ICBMs:

a. Propulsion: A single, 220,000-pound-thrust engine with a second stage could have orbited Sputnik I; a three stage vehicle would have been required for Sputnik II. Such a system could be used to send a 2,000-lb. warhead about 4,000 miles. By coupling two 220,000-pound-thrust engines as the first stage, both Sputnik I and II could have been easily orbited as far as the first-stage thrust requirements is concerned. This system could send a 2,000-lb. warhead 5-6,000

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miles. We do not know whether a single or double engine was used in the first stage of their ICBM vehicle flight tests or their earth satellites.

b. Guidance: Guidance errors permissible in orbiting a satellite would not be acceptable for guidance of an effective ICBM. Thus, while it is obvious that the Soviets can place a satellite into an elliptical orbit, this does not of itself indicate an acceptable guidance capability for an ICBM.

c. The present satellites do not provide us any evidence of Soviet success on the ICBM re-entry problem.

d. We do not believe their earth satellite program will interfere with their ICBM programs; rather, it will probably provide valuable test data thereto.

38. With this brief background on the relationship between the Soviet earth satellite and ICBM programs and bearing in mind the extensive Soviet ballistic missile experience factor mentioned earlier, I will now turn to our current assessment

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of Soviet ICBM capabilities. We have much data which take time to analyze and we have not yet completed the resolution of differences of interpretation of these data. As of today, the estimates of the date at which the Soviets will have the first operational ICBM capability vary between 1958 and sometime in 1960. This missile could deliver a 2,000-pound, high-yield nuclear warhead with an accuracy (CEP) of 5 nautical miles at a range estimated between 3,800 and 5,500 nautical miles, depending on the propulsion system used in the first stage. The significance of this threat to the US is indicated on this Chart (See Chart). I should like to emphasize, however, that we have no firm evidence of construction of bases for launching ICBMs or of their deployment.

39. The dates by which the USSR could have significant numbers of ICBMs available for operational use are dependent on a number of factors and the best we can do now is to give an estimated range. We would assume that before going into

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production, a considerable number of test vehicles would be fired. Of course in a field like this where perfection always lies ahead, the time during a test period when one goes into production depends upon the absolute urgency of the particular program. You can cut off at various stages during the testing period if you are willing to compromise on a weapon which has reasonable operational proficiency, but which at the same time falls short of the optimum desired.

The intelligence community is not as yet in agreement as to the probable dates when the USSR will have varying amounts of ICBMs and the dates and amounts given below cover time spans embracing the varying estimates and are examples, rather than firm estimates, as it is possible that the USSR itself is today adjusting its time schedules. With these reservations, we state our belief that:

a. The Soviets could have an initial operational capability (ten ICBMs - prototype) between the latter half of

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1958 and early 1960; and assuming the foregoing,

b. one hundred ICBMs could be available for operational use between the middle of 1959 and late 1960 and

c. five hundred ICBMs could be available for operational use between the middle of 1960 and 1962.

CIA at the present time believes that the earlier dates are the more likely but the whole problem is under urgent review at this moment.

B. Cruise-type Missiles

40. We believe the Soviet surface-to-surface missile program also includes submarine launched missiles. Although we have very little direct evidence of Soviet activities in this field, Khrushchev has repeatedly mentioned this type. Such a weapons system would pose a very serious threat to the US and our overseas bases, and as such is estimated to be a Soviet military requirement. We estimate that the USSR could now have supersonic cruise-type missiles capable of maximum

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ranges of about 500 nautical miles and that in 1962 a supersonic cruise-type missile of up to 1,000 nautical miles range could probably become available for operational use. We further estimate that these systems would be augmented or replaced by submarine launched ballistic missiles of intermediate range in the period 1964-66. Each of these missiles could carry high-yield nuclear warheads.

41. In the air-to-surface missile category, we have firm evidence of Soviet interest in and development of such a missile system. In 1955 the USSR could probably have had a 20-nautical-mile subsonic air-to-surface missile available for operational use. A 55-nautical-mile subsonic-missile could now be available and a 55-nautical-mile supersonic missile could probably be available in 1958. These missiles, designed primarily as antiship weapons, could also be employed against isolated and well defined radar targets on land. In 1961, a 100-nautical-mile supersonic missile could probably be

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evidence of Soviet air-to-air missile activities. Our efforts to improve our knowledge in this area have continued at high priority. 25X1

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We estimate that, for improving the effectiveness of its interceptors, the USSR could now have available a short range (2-3 nautical miles) air-to-air missile equipped with high explosive warheads capable of tail-cone attacks in good weather. We believe that they could also now have a 5-nautical-mile all-weather missile. A 15-20 nautical mile all-weather missile capable of employing a nuclear warhead could be available in 1960.

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of critical areas, and with low and high altitude capabilities for defense of static targets, field forces, and naval vessels, could probably become available for operational deployment. Sometime between 1963 and 1966, the USSR could probably have in operation a surface-to-air system of some capability against the ICBM.

44. We estimate that series production of surface-to-air guided missiles is now under way in the USSR, and that such missiles will probably be produced in large quantities. (A Soviet surface-to-air missile resembling our Nike AJAX was observed in the recent Moscow parade.) Nuclear warheads could now be incorporated into a limited number of surface-to-air missiles. We estimate that some percentage of surface-to-air missiles will be so equipped between now and 1966.

B. Air-to-Air Missiles

45. [redacted] 25X1

25X1 [redacted] we have practically no

 [redacted] 25X1

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available for employment by heavy bombers. Each of these missile types could employ nuclear warheads.

Nuclear Tests and Warheads (oral presentation from charts)

DEFENSIVE MISSILE CAPABILITIES

A. Surface-to-Air Missiles

42. We estimate that surface-to-air missile systems have had one of the highest priorities among Soviet missile programs. At Moscow, an extensive system of surface-to-air missile sites has been constructed, and all sites are probably now operational (See Chart). Similar installations appear to be under construction around Leningrad. This surface-to-air missile system can probably direct a very high rate of fire against multiple targets at maximum altitudes of about 60,000 feet and maximum horizontal ranges of about 25 nautical miles.

43. During the period 1958-1961, surface-to-air systems with increased range and altitude capabilities for static defense

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SOVIET LONG-RANGE BOMBER AND SUBMARINE FORCES

Long-Range Bomber Force

46. The USSR started almost from scratch at the end of World War II, during which it had no real strategic bombing force, and has since built up a force of at least 1,500 long-range bombers, with necessary supporting facilities. In forming a first nucleus for this force, the USSR took advantage of our B-29 design, copying it in the BULL medium bomber. (The term BULL, incidentally, like the other aircraft designations I will refer to, is a nickname used by US intelligence for convenience: the Soviets call their version of the B-29 the TU-4). BULLs were produced in large numbers - peak Soviet operational strength in BULLs was between 1,100 and 1,200 in 1954 and early 1955.

47. While BULL strength was being built up, Soviet designers were working on native long-range bombers in both

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the medium and heavy categories. (This chart shows the results of their work.) By 1954 they had developed and began to have in operational units the BADGER jet medium bomber, approximately equivalent in performance to our B-47. As BADGERs began to enter service, a gradual phase-out of the BULL was begun. By 1955 they had developed and began to have in operational units two different heavy bomber types, the BISON jet heavy bomber, approximately equivalent to our B-57 and the BEAR turbo-prop heavy bomber. (The chart gives our estimates of some key performance characteristics of these newer bombers. These estimates are at present under review in the light of accumulating evidence. It is probable that there will be some downward revision in estimated performances, at least with regard to the speed and altitude capabilities of the BISON.)

48. With regard to capabilities to attack targets in the continental US -- in general terms, the BADGER with a

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10,000-lb. bombload can reach most such targets on one-way missions from staging bases in the Soviet Arctic. Inflight refueling would increase BADGER capabilities against US targets, but would still offer little prospect of return to the USSR. However, the BISON, launched from Arctic staging bases, could reach some US targets on unrefueled two-way missions, and could reach considerably more of such targets if refueled en route. The BEAR, with its greater range capabilities, could reach virtually all US targets on two-way, unrefueled missions from staging bases, and with inflight refueling could accomplish the same missions from bases well inside the USSR.

49. Soviet Long Range Aviation, as of mid-1957, includes at least 1,500 bombers, of which we estimate about 550 are BULLs, about 850 are BADGERs, and at least 90 (possibly as many as 150) are BISON and BEAR heavy bombers. We have just completed an estimate on the Soviet long-range bomber force,

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in which we devoted special attention to a thorough review of all the evidence on the heavy bomber program, as of mid-1957. Good evidence indicates that a minimum of about 90 heavy bombers (BISONs plus BEARs) are now available for operational units, and the majority view in the intelligence community is that this is likely to be the actual strength. Beyond this point of good evidence, however, there is an area of considerable uncertainty, and there is some evidence suggesting that operational heavy bomber strength may be as much as 150 aircraft.

50. In either event, the Soviet heavy bomber program has again fallen somewhat behind our projections of the previous year. This is true of at least BEAR production, and, if the lower figure is the more accurate one, of BISON production as well. On the other hand, BADGER production has somewhat exceeded our expectations. While we are still checking to determine the amount of short-fall in heavy

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bombers, and the reasons for it, it does seem that the strenuous Soviet efforts to get heavy bombers into production, in the period up until 1955, have not been confirmed in the past year or so.

51. The explanation may be in part in the field of technical problems. For example, it is possible that larger-scale production has been delayed pending the availability of higher-thrust engines or other developments expected to improve performance characteristics. But there is also serious question regarding Soviet intentions in the heavy bomber field. Soviet planners are aware, of course, that they already have a strong medium bomber force which they could employ in case of need. They also probably have great confidence that advanced weapons systems, including ICBM's, will become available to them in the relatively near future. In this connection, we have noted statements of Khrushchev and others, stressing the view that the manned aircraft is

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declining in importance as contrasted with guided missiles. Such statements have been publicized extensively in the Soviet press, and may in part be intended to cover up for delays in heavy bomber production or to pave the way for a de-emphasis in the bomber program. However, they are also clearly part of an effort to take maximum propaganda advantage of Soviet successes in the missile and earth satellite field, and are probably also a deliberate effort to degrade the capabilities of present US retaliatory forces in the eyes of the Soviet people and the Western world.

52. While long-term Soviet policy with regard to heavy bombers is thus in doubt, on balance we believe the USSR will retain a strong, long-range, manned bomber force (I am here referring to both medium and heavy bombers), at least until new weapon systems are proved and a substantial capability has been acquired.

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53. In any event, Long Range Aviation is the major current threat, and its capabilities are still increasing. Specifically, heavy bombers are in production, and medium bombers are being produced at a rapid rate. The total force has increased by at least 200 bombers in the past year. An inflight refueling capability has been developed, apparently using convertible tanker-bomber versions of the BISON and BADGER, and we believe it is in at least limited use by operational BISON units. [redacted] 25X1

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Submarine Force

54. Dr. Scoville has described Soviet capabilities in the field of cruise-type missiles suitable for launching by

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submarines. The USSR has a large force of submarines available for modification or conversion to guided-missile use, and could already have suitably modified submarines in operation.

55. Through a postwar building program unprecedented in peacetime history, the USSR has built a submarine force which (as of mid-1957) numbers approximately 475 boats. This strength, incidentally, is more than eight times the submarine strength with which Germany entered World War II, and is greater than Germany's peak sub strength in May 1943. About 250, or more than half, the USSR's subs are snorkel-equipped, long-range units of postwar design and construction.

56. Soviet subs are deployed in the four major fleet areas - Baltic, Black Sea, Pacific, and Northern. We are particularly interested in the large concentration of 115 long-range subs in the Northern Fleet area. This area has unrestricted access to open seas; its waters are normally navigable the year round.

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57. We noted with interest Khrushchev's statement, in 1955, that "a submarine equipped with guided missiles is the most suitable naval weapon, and its development will be emphasized by the Soviet navy." Any of the present Soviet long-range submarine types could be equipped to carry one or two cruise-type missiles in topside stowage, and as an interim measure, the USSR would probably equip them in much the same manner as those of the US Navy - with storage housings and launching ramps on deck. We have not yet confirmed the existence of such Soviet submarines, but we have received reports from widely separated areas describing subs with suspicious looking topside installations. The USSR could also construct nuclear- or conventional-powered submarines, about the size of their present long-range boats, to accommodate up to four cruise-type missiles internally.

58. In this connection, we have recently become aware of a significant change in the Soviet submarine construction

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program. It now appears that construction of conventional long-range submarines has been sharply curtailed this year. This, we believe, probably signals the termination of this program and a shift to the construction of new types, probably including nuclear-powered and guided missile launching designs.

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