DCI JOINT BRIEFING FOR PREPAREDNESS INVESTIGATING COMMITTEE OF THE SENATE ARMED SERVICE COMMITTEE AND THE SENATE AERONAUTICAL AND SPACE SCIENCES COMMITTEE

I. INTRODUCTION

A. Has been almost a year since I last appeared before you to discuss Soviet missile and space programs. My pleasure to be here again. Many significant developments have occurred last 12 months. We in intelligence community have taken occasion to review our assessments — prognosis in view of new evidence.

B. Discussion today will include summary of Soviet missile program in its major aspects.

C. Will discuss Soviet space program.

D. My remarks will be primarily based on NIE's which represent views of the entire US Intelligence Community.

E. With your permission, Mr. Chairman, I will proceed along these lines.

II. SOVIET GUIDED MISSILE PROGRAM

A. Will comment on general Soviet military picture as backdrop to detail following. The Soviet leaders currently show great confidence that they believe trend of events is in their favor.

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1. Their rate of economic progress, their scientific achievements, their growing missile capabilities, and their estimate of the political tendencies in underdeveloped countries all suggest to them a favorable shift in world power relations.

2. From the position of strength which they believe they now have, they feel able, not only to engage the West vigorously on disputed issues when they wish to do so, but also to relax tensions when expedient without any imputation of weakness.

B. In Soviet external policy over the next five years, we expect to see elements of pressure and detente combined and varied as tactical advantage may suggest.

1. Whatever changes of emphasis may occur, the swings of policy are likely to fall within a range which excludes:

(a) On the one hand, deliberate assumption of serious and uncontrollable risks of general war; or

(b) On the other, any abandonment of the concept of continuing struggle between two irreconcilable worlds.

2. Soviet leaders may seek to draw political advantage from any improved power position relative to the West if it emerges as they expect.

(a) They will still try to win concessions basically through negotiations;

(b) But the element of pressure and threat will probably become more pronounced.

(c) The chances of miscalculation may be increased.

C. It is in the context of this general estimate that I wish to present our estimate of the developing Soviet capabilities for strategic attack against USA or its major overseas bases.

1. These Soviet capabilities undergoing major transitions:

(a) Have rested primarily in long and medium range bombers with nuclear bombs, some equipped with air-to-surface missiles.

(b) Bomber force now being increasingly supplemented by ground-launched ballistic missiles and missile-launching submarines.

(c) Increasing ballistic missile capability will become main element in Soviet strategic threat. During 1960 it will become a threat against industrial and population complexes in the USA — and by 1961 a threat against our retaliatory power.

III. MISSILE WEAPON SYSTEMS AND TEST PROGRAMS

A. USSR made considerable progress in ballistic missiles during 1959.

1. Soviet ICBM test-firing program has proceeded in orderly manner — while evidence still inadequate to judge precise timing, we believe that for planning purposes we must estimate that by 1 January 1960, USSR had initial operational capability

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with a few (say, 10) series produced ICBM's.

CHART 1

2. To date there have been 21 or 22 successful Soviet ICBM firings to 3,500 nautical miles or more. Fifteen of them in 1959, including long shots into Pacific beyond usual Kamchatka impact area for ICBM's. One to date in 1960 to new Pacific test area, but we are not certain whether ICBM of space test shot. Also some failures,* of course.

chart?

Might add here that ruggedness Soviet ICBM booster, vehicle design is apparent beneficial factor their successful launching ICBM's, space vehicles. Their early possession of 220,000 lb. thrust engine, certainly now improved, (or larger new engine available) gave them a jump on U.S. in this respect. Would be wrong however, attribute their present impressive record completely to "Prime force" approach.

3. In [illegible], Soviet ICBM probably capable of carrying about [illegible],000 pound nuclear [illegible] multimegaton yield to [illegible],500 nautical miles.

4. Have recently [illegible] another re-examination of [illegible] sets concerned with Soviet ICBM accuracy.

5. Estimated CEP under operational conditions at initial operational capability was probably about 3 nm. with the missile using a radio-inertial guidance system. All-inertial guidance will

*(Back up statement on failures later.)

probably be introduced in 1960-62. We estimate that by 1963, the accuracy (CEP) of the all-inertial system could be about 2 nm. and that of the radio-inertial could be somewhat better. Some difference of opinion in intelligence community as to this estimate of accuracy, as the data is far from precise. Needless to say, this question is under continuous study.

reliability prior to launch

6. In-flight reliability of the missile, i.e. from the time it leaves its launcher until detonation in target area, is now estimated at between 55 and 75 percent at IOC, and improvable to 70-85 percent after about 3 years. This question is also under continuous study -- this is a terrible, complex problem, but we are working to incorporate the data on Soviet test reliability with other factors which would affect reliability under operational conditions.

B. For delivery of nuclear warheads against land targets at medium ranges (and this could include most of our overseas bases), USSR has had 700 nm. ballistic missiles (and of course shorter range missiles) available for the past few years, and we believe 1,100 nm. missiles became operational in late 1958 or early 1959.

C. Inventory of 700 and 1100 nm. missiles estimated at a total of about 330 in mid-1960 (160 on launcher, and about 100 produced).

1. Estimate that both types are in series production.

SHYSTER Photo

2. Believe troops have trained with both, and have some sketchy evidence of deployment of 700 nm. missiles in East Germany and possibly the 1100 nm. missile in Soviet Far East.

3. Know little about the deployment of ICBM's or IRBM's. However, Khrushchev boasted that they are movable.

D. A few conventionally-powered Soviet submarines now evaluated as probably capable of launching short-range ballistic missiles with nuclear warheads, though not from a submerged position.

Modified "Z" Class Photo

1. One type of modified long-range submarine can probably carry two ballistic missiles of 200 nm. or possibly 350 nm. range.

2. A newly-constructed submarine class first identified in 1959 may carry about 5 missiles of about 350 nm. range.

3. Based on requirements and technical capabilities, estimate that in 1961-1963 USSR will first achieve a weapon system combining a nuclear-powered submarine with a 500-1,000 nm. range ballistic missile, capable of launching from submerged position.

4. Believe they now have a few nuclear subs -- but not identified.

5. In the surface-to-air missile category, two large rings comprising 56 fixed installations surrounding Moscow remain unique. Nowhere has a second such operational installation been identified.

Chart 2 (SIAM) Photo

1. Soviets are also deploying new second-generation surface-to-air system capable of more effectively delivering high explosive or nuclear warheads against present Western bombers. The effectiveness of this system against very-low altitude attacks cannot validly be determined.

2. This new system has been identified in East Germany and in defensive positions around many Soviet industrial and population centers. In contrast to massive, immobile system around Moscow, new system is flexible and can at relatively low cost, be deployed widely for defense of large areas, smaller fixed points, and forces in the field.

[illegible]. In air-to-air missile category, we still estimate that USSR has several types of short-range air-to-air missiles with ranges of about six miles. Estimates based almost entirely on military requirement rather than tangible evidence.

[illegible]. Standoff Attack with Air-to-Surface Missiles

1. Since 1956-1957, Soviets have had subsonic anti-ship missile with maximum range about 55 nautical miles, carrying a conventional size high or nuclear warhead.

2. As U.S. defense capability increased, we believe Soviets developed improved air-to-surface system.

3. Intelligence community estimates that in about 1961, a supersonic missile of this type with moderate size warhead and range about 350 nautical miles will be in use.

4. Not sure system will be used against land targets, ships at sea, or both.

II. Missile Test Ranges

Chart 3 (RANGES)

1. Flight tests with missiles of ranges up to 1,100 nautical miles are conducted at Kapustin Yar Range. Intelligence coverage of this range is by multiple sources, including radar and ELINT.

2. Since mid-1953, have been over 500 ballistic missile flight tests, and considerable number high altitude vertical firings.

3. Some vertical shots carried animals which were successfully recovered.

4. This extensive flight test program gave Soviets an experience factor which provides a major basis for the initiation of an their continuing ICBM and space vehicle successes. Also has directly supported component and sub-system testing for space flight use.

5. Soviet space and ICBM flights have mostly been conducted on a range extending from Tyura Tam (in Central Asia just east of Aral Sea) which is the rangehead. There have also been several missiles fired which impacted in the Pacific Ocean (see chart).

6. Including the first ICBM test shot in August 1957, there have been a total of 17 successful launchings to the general vicinity of the Kamchatka peninsula. Additionally, there have been five firings which landed out in the Pacific Ocean. Of these five, two, in (date later), were launched to about 700 miles beyond Kamchatka, and another two, in October 1959, about 1100 miles beyond.

7. Will digress here -- discuss 20 January firing to new Pacific test area near Johnson Island:

(a) Evidence indicates total flight range, from Tyura Tam, of about 6530 nautical miles (about 7500 statute miles). Flight time about 40 minutes. Impacted in northern half of Soviet announced area.

(b) Telemetry intercepts over most of flight path. Also detected by radar, other instrumentation, and observed visually.

(c) No evidence of any search or recovery type operations by SIBIR vessels.

(d) Tentative conclusions — vehicle did not carry object, such as biological specimen, for recovery.

(e) No evidence of retardation devices on re-entry body.

(f) May have been re-entry test of ICBM warhead but cannot rule out Soviet announcement that test was more powerful booster system for space vehicles.

(g) Soviet announced range (7760 statute miles) about 250 statute miles greater than indicated by our evidence. Soviets could have been giving the total distance the missile flew, rather than the ground range, as the flight distance had to accommodate the turning of the earth during the missile flight time of about 40 minutes.

SIBIR Photos

8. To accomplish this new extension of Tyura Tam range into Pacific, Soviets have provided four SIBIR class freighters equipped with largest type ship-borne radar and other unique and highly specialized electronic equipment. Since these sea-borne instrumentation ships are mobile, they could provide global instrumentation capability for ICBM and space flight research.

I. Future Growth of Soviet Intercontinental Striking Capabilities

1. Will be primarily a function of development, production, and deployment of ICBM's.

2. In absence of evidence on Soviet plans and programs, intelligence community has estimated ICBM force goals Soviets might establish over next few years.

3. This analysis shows USSR would probably estimate that it would have its most favorable opportunity in 1961, through rapid buildup in ICBM's, to gain certain military, political, and psychological advantages over U.S.

4. This would be consistent with present deliberate and orderly tempo of Soviet ICBM test firings. And with Soviet policy of maintaining balance among various types of military forces during a transition to increased reliance on missiles, and pre-occupation with achieving 7-Year Plan goals.

J. We estimate that present Soviet ICBM program would provide some 140-200 ICBM's on launcher in mid-1961. This assumes a total inventory of 175-270 and a total production of some 225-350.

1. Production of missiles could be accomplished in available plant facilities -- bulk of effort would be in constructing launching facilities, activating and training ICBM units, and providing logistic support.

2. Even to have 140 ICBM's on launcher in mid-1961 would require a vigorous program -- to have 200 at that time would introduce considerable strain on their industry.

3. But such programs could be accomplished by mid-1961, along with other Soviet military programs, without appreciably hindering present Soviet plans for industrial development (7-Year Plan goals).

4. There is a fairly broad spread in our estimate of the Soviet ICBM force after 1961.

5. Based on present evidence of Soviet policies and programs, our estimate of Soviet ICBM's on launcher is in the range of 250-350 in mid-1962 and in the range of 350-460 in mid-1963.

6. Air Force intelligence believes that growth of missile force after 1961 will be considerably greater than this.

7. All of us in intelligence community recognize that course of Soviet program is likely to be affected by changing technology and by developments in international situation.

8. Hence, we believe that any numerical projections, particularly beyond 1961, must be carefully and continuously reviewed in light of all evidence we may obtain as to urgency and priority which Soviets give ICBM program.

9. After about that time, our own missile build up, particularly the planned increase in semihardened and hardened U.S. ICBM sites, would result in very steep increase in Soviet ICBM requirements to knock them out.

10. Also our bombers on alert or undestroyed;

11. Also carriers and missile-launching submarines at sea;

12. And any other bases they failed to neutralize, particularly our overseas bases.

13. Unless in about 1961, the Soviets can achieve a much larger number of ICBM's, better accuracy and greater reliability than we now estimate for them, they would not be able, in view of these and other more intangible elements such as inherent difficulty, operationally, or timing ballistic missles and air attacks from widely dispersed launching bases against targets dispersed around the globe, to achieve the element of surprise and destruction which would give them what they would consider to be adecisive military superiority.

14. They would probably estimate that they would still receive unacceptable damage through retaliation.

15. Present indications are that Soviet ICBM program is not a "crash" program. But we believe it is designed to provide a substantial ICBM capability at an early date.

16. Goal is probably a force as large as they think necessary for substantial deterrent and a pre-emptive attack capability of considerable proportions. That is, a capability to seize the initiative from an enemy believed to be preparing to attack.

IV. SOVIET SPACE PROGRAMS

Turning to Soviet space program, will discuss:

(a) Principle space activities during past year, along with our evidence of present and future Soviet technological capabilities for space research.

(b) Estimated objectives and scope of space program

(c) Organization and administration

(d) Our estimate of future trends in Soviet space programs

A. Space Activities

IV

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Since my last appearance before you two events have occurred which deserve special comment, namely, LUNIKS II and III. Chart 4 shows possible configurations for the launch vehicle. Our analysis, based on ELINT and photography of SPUTNIK booster, leads us to believe this launcher has been used for both LUNA and recent space shots (at least SPUTNIK III and LUNIKS), and that it is parallel or "wrap-around" configuration, not tandem. These probes represent major feats in theory and technology — and far exceeded any prior Soviet or U.S. space event in their spectacular character.

1. LUNIK II

a) Launched 12 September 1959.

b) U.S. and UK radiotelescopes tend to confirm evidence of impact on moon. Reported loss of telemetry signals (on 39.986 and 183.6 megacycles) at time predicted by Soviets. Jodrell Bank radiotelescope reported the expected change in frequency as LUNIK II approached moon. U.S. Millstone radar reported increase in signal strength as vehicle approached moon (this explained as being signal amplification resulting from reflection of signal from moon's surface) and signal loss at predicted impact time. No photographic or visual proof obtained.

c) Khrushchev arrived in the U.S. on 15 September 1959, a matter of only a few hours after impact on moon was announced.

d) The intended point of impact was not announced. Therefore, a meaningful statement of guidance accuracy cannot be made.

e) Although LUNIK II was spectacular, did not represent as major technological advancement as LUNIK III.

2. LUNIK III

a) Launched 4 October 1959, on the 2nd anniversary date of SPUTNIK I.

b) Only several hours after launch, purpose was announced as being to photograph the moon.

c) The intended trajectory is not known. However, the announced mission, which was photographed, was accomplished. Western tracking data was not obtained. Jodrell Bank was able to intercept signals on one of the announced frequencies at the times announced in advance by the Soviets. U.S. intercepts were not practical because transmissions were ground activated while LUNIK III in line-of-sight of USSR.

d) Signal ceased after 7 November 1959. This was announced by the Soviets. Soviets speculate LUNIK III struck by a meteorite, but we consider it equally possibly that a normal equipment failure may have occurred.

e) Western scientists could not produce photographs from data they received. This caused by Soviet failure to announce in advance frequency for transmitting photographic data. Jodrell Bank radiotelescope was therefore not adjusted to accept fully the tele-facsimile type of signal actually transmitted and received good signals from main transmitter only. Nevertheless, we convinced Soviet photographs genuine.

f) Considerable data other than photographic were transmitted and recorded by U.S. on tape. Because Soviets have not identified these data, we are all but precluded from analysing what we have.

g) We consider LUNIK III a very great technological achievement. Clearly attests to very high Soviet capability in designing and developing sophisticated stabilization, photographic and data transmission systems. Very complex operation to place vehicle in proper trajectory stability in proper direction and take and transmit data to ground station. Altogether, Soviet accomplishment demonstrated by LUNIK III, is a technical accomplishment of first magnitude, and we should harken to its significance.

B. In addition to lunar probes, USSR has conducted extensive series of high altitude research firings.

1. They have displayed nose sections recovered from rocket fired vertically to altitudes of 60 nm., 120 nm. and 250 nm.

2. Live dogs were carried in some rockets and successfully recovered even from the highest altitudes.

C. Vehicle Design

1. Analysis of photographs of Soviet missiles and evaluation of LUNIK last stage indicates that Soviet structural design is heavier and more rugged than U.S.

2. If, as seems likely, the Soviets developed their basic ICBM and space vehicle engine from 100 metric ton unit,

first tested in 1958, it might now have higher thrust and increased payload capability.

3. SPUTNIK III and LUNIK series probably have a gross weight of about 500,000 pounds. The initial thrust of launching rockets was about 750,000 pounds, approximately twice those of largest current U.S. missile and space launching vehicles.

4. We estimate that within a few years they may achieve conventional engines with thrust ratings of 2 million pounds or more.

5. With such engines, feasible to place into low earth orbits, total weights on order of 25,000 pounds, or higher.

D. Guidance and Accuracy

1. USSR not likely to be hampered in any space undertaking in the near future by guidance difficulties.

2. Soviets believed to be using radio-inertial guidance system, at least in LUNIK series, and possibly for ICBM vehicle guidance.

3. Believe that Soviet all-inertial guidance systems not yet sufficiently advanced for ICBM and space work.

4. Future Soviet capabilities not known, but not likely to remain static since basic theory and techniques pertaining to guidance are strongly developed in USSR.

E. Recovery Techniques

1. USSR may have attempted two recoveries of nose cones or capsules from two long ranges rocket flights in October 1959. No information available as to success of these attempts.

2. There is no evidence that USSR has attempted to recover payloads from orbiting vehicles as has U.S.

F. Man in Space

1. There have been several recent reports that Soviets have already attempted to recover a man from space. No evidence to lend credence to these reports, however.

2. Sedov, Chairman of the Soviet Interagency Commission for Interplanetary Communications (ICIC), on recent visit to Washington stated that "the problems of astronaut recovery have not yet been solved."

3. In summary, little is known of USSR plans for early man-in-space operations except expressed determination to recover man from orbit at an early date as initial step toward proclaimed ultimate aim of manned exploration of space.

G. Objectives and Scope

1. Overall objectives of Soviet space program are apparently the following: to conduct scientific research;

to obtain manned space vehicle and to support Soviet programs and policy.

2. No direct evidence that Soviets are developing space systems for military use, whether as weapon carrier or support system in such areas as reconnaissance, communications or early warning.

3. Capable of developing such military support systems if and when requirements arise. However, lack of symmetry produced by Iron Curtain reduces Soviet requirement for reconnaissance satellite as compared to U.S. Large contiguous geographic area of USSR reduces need for communication satellite.

4. Soviet exploration of space to date has comprised six major events; three satellites and three lunar probes.

5. Past program suggests a continuing emphasis on carefully planned major space accomplishments.

II. Organization and Administration

1. Administrative responsibility for space flight research is belived divided between civilian and military authorities, with broad scientific research progress directed by civilians and launching vehicle development program directed by military.

2. The Interagency Commission for Interplanetary Communications under the Astronomical Council of the USSR Academy

(Chart 5 (Science Organization)

of Sciences apparently is focal body for coordination and planning of space flight research program. Active at least since 1954 when we first became aware of its existence.

3. The Commission may be the coordinating body which links the purely scientific aspects of space research with the military.

4. Guided missiles authorities are believed responsible for development of launching vehicles and this development program is probably controlled by a special committee of the Council of Ministers on guided missiles and space vehicles.

5. No direct evidence of priority of space program relative to that of military missile program. No evidence that two programs have interferred with each other and we believe they will not be permited to interfere in the future. Key personnel in launching and space vehicle development phase of space program are believed to be also key missile personalities.

I. Future Soviet Space Program

1. We have no firm evidence on Soviet future plans for exploration of outer space with either unmanned or manned vehicles.

2. We believe they will continue to expand their scientific research in space with further unmanned earth satellites, lunar probes (including satellites and soft landings), and solar and planetary probes.

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3. Early this month, Blagonravov, a member of the Interagency Commission on Interplanetary Communication, stated that the Soviets will launch a series of smaller unmanned satellites for scientific research.

4. Since manned exploration of planets is an expressed Soviet objective, manned experiments will probably be conducted in earth satellites, circumlunar flights and soft landings on moon.

5. We expect that all manned flights into outer space will be preceded by tests with animals, unless for political purposes Soviets attempt high risk program.

6. No attempt made to estimate manned space missions beyond earth-moon realm. Time periods in which major sub-systems, such as propulsion, guidance, and capsule for prolonged manned flight can be developed into a complete space flight system cannot be foreseen.

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SEPARATE SHEETS IN BACK-UP BOOK

N. Psychological and Political Aspects

Study of world reaction to Soviet space achievements indicates the following:

1. The Soviets have exploited their achievements in space missions skillfully and deliberately for purposes of political propaganda. This campaign has been very effective in demonstrating to the world the rapid technological advancement of the USSR. This campaign has also raised serious doubts throughout the world concerning the technological supremacy (and hence -- so the argument runs -- the military superiority) of the United States.

2. World attention to U.S. and Soviet space activities currently continues high, in general, although it does not match the intense interest produced by the first SPUTNIK launching. The dramatic appeal of that event generated extraordinary breadth of interest, and no subsequent single space venture has evoked comparable coverage or comment, although interest in subsequent space developments such as LUNIK II and III continues both widespread and sustained.

3. Reaction to space activities from all audiences shows a clear disposition to equate achievements in this field with military strength and to make it increasingly a symbol of national

power and effectiveness. Popular concern with the military potential of space experiments, though prominent, is not in general very precisely or elaborately developed. There appears to be an expanding tendency to view space activities as indicative of general technological and scientific standing, and to some extent as an index of the effectiveness and vigor of national capabilities in general. Scrutiny of educational and economic systems, for example, appears to be linked with increasing frequency to the measure of success in space activities.

4. World consensus now appears to place USSR substantially ahead of U.S. in space activities. This judgment is qualified in some areas. Among better informed and more sophisticated groups abroad, there is still belief that U.S. leads in general scientific and technological capabilities. In other groups, successful U.S. post-SPUTNIK space activities restored confidence in U.S. ability to catch up eventually. The dominant reaction was to expect a see-saw of competition with first one and then the other ahead with no decisive victory in sight and no singular achievement demonstrating conclusive superiority.

However, as aftermath of LUNIK II and III, that pattern of reaction could not be maintained. Cumulative impact of recent Soviet successes appears to be affecting judgments heretofore suspended or oscillating. With these Soviet successes there has

emerged increasing doubt that the present tempo of U.S. space activities is likely to allow the U.S. to regain the lead.

5. In summary, the USSR has shown a singular advantage in planning and propagandizing space exploits and has reaped rich political rewards as a result. People will continue to be impressed and swayed by space missions which possess, in addition to scientific attributes, an adventurous or spectacular nature. Because of very real political and economic implications inherent in such appraisals, it is impossible to dismiss as trivial or unimportant the Soviet strategem of including in its space program popularly appealing "firsts". They have also profited from a widespread popular conviction that space activities are essentially military exercises. In this context, Soviet space achievements indicate in the eyes of many a vital change in relative balance of military power between East and West.