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CENTRAL INTELLIGENCE AGENCY

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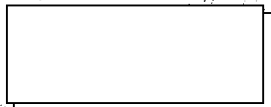
INTELLIGENCE MEMORANDUM NO. 269

SUBJECT: Estimate of Soviet Capabilities With Respect to New Weapons in 1951 and 1954.

1. The following is an estimate of Soviet capabilities to employ new weapons, broadly defined, in the event of a major war's occurring between the present and mid-1951:

1.1 Atomic Bombs (AW)

The atomic explosion within the USSR in August 1949 is believed to have been the first successful Soviet atomic bomb test. This event brought into focus information not previously integrated into estimates of Soviet atomic capabilities. It is now estimated, assuming plutonium bombs of roughly 20 kilotons explosive power, that the atomic bomb stockpile available to the USSR will be:



1.2 Radiological Warfare (RW)

Although the USSR has the basic facilities for producing small quantities of radiological warfare agents, it is believed these will not be a factor between now and mid-1951. However, the employment of atomic bombs to neutralize major harbor installations by their residual radiations from an underwater bomb burst must be considered as probable.

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1.3 Biological Warfare (BW)

The USSR is obviously interested in BW research and development. BW sabotage is well within present Soviet capabilities. It is estimated that bulk production of BW agents may by now be adequate for limited military operations.

1.4 Chemical Warfare (CW)

The Soviet Union is now capable of large-scale employment of standard CW agents. Limited strategic and tactical use of the nerve gases (G-Agents) will be possible during 1950.

1.5 Guided Missiles

1.5.1 Surface-to-Surface. In addition to German V-1 type missiles which may be presumed to be in production in the USSR at a rate depending largely on the priority assigned, Soviet missile development has progressed to the point where V-2 weapons are being manufactured in at least small quantities.

1.5.2 Surface-to-Air. It is possible that the Soviets may have a rather crude surface-to-air guided missile ready for use by early 1951 or possibly late 1950. They probably would not have more than 50 to 100 such missiles.

1.5.3 Air-to-Air. It is not believed that the Soviet Union will have any air-to-air guided missiles available for use before mid-1951.

1.5.4 Air-to-Surface. It is believed that the Soviet Union has the capability of producing the Hs-293 and the Fritz X missiles.

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1.6 Proximity Fuzes

There is little or no direct intelligence regarding Soviet development of proximity fuzes. Germans in the USSR have developed a simple V-T fuze for guided missile use. Because of adequate space, printed circuits were not used, but it is believed a relatively more complicated artillery V-T fuze is in production. American manufacturing techniques are believed to be known to the Soviets, and the fact that Sweden and other European countries have developed sophisticated fuzes leads to the conclusion that the Soviets probably have developed and produced similar fuzes.

1.7 Radio Countermeasures (RCM)

1.7.1 The Soviets have all information necessary for the development of RCM. They have used "Window" in the past, and this and similar reflection devices will almost certainly be encountered in the future. In addition, electronic jamming will probably be encountered at all frequencies up to the 3000-mc region by mid-1951.

1.7.2 At the present time the Soviet Union is engaged in extensive jamming of radio communications at lower frequencies. To date this jamming has been confined almost entirely to the Voice of America broadcasts. However, the experience gained by the Soviets in this area, and particularly the facilities already established, are such that jamming could become a serious obstruction to radio communications in general.

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1.8 Radar

1.8.1 Early Warning Systems (EW). The USSR has established rather crude early warning networks at both Eastern and Western approaches using some microwave equipment. Inadequacies in present equipment may be offset by effective coordination of the network; such an extensive coordination network has already been established to control the Voice of America jamming program. By mid-1951 it is reasonable to expect effective EW radar coverage at all, except low, altitudes in the Western approaches with at least crude coverage in the East.

1.8.2 Air Intercept (AI). The USSR will probably have enough AI apparatus to equip 100 to 200 night-fighter aircraft by mid-1951. There has been little knowledge of use of passive AI equipment, though the possibility cannot be overlooked. These night fighters can be expected to have tail-warning radar.

1.8.3 Ground Controlled Intercept (GCI). Ground controlled radar working with aircraft employing the limited number of air intercept equipments mentioned above may be expected near key defense areas. In 1951, however, principal reliance will be on visual interception with contact established by GCI.

1.8.4 Fire Control Systems. The USSR is believed to have received automatic gun-laying radars through lend-lease together with fire control directors of the most advanced design for use with them. This makes it reasonable to expect limited radar directed antiaircraft fire in defense of key installations in 1951.

1.9 Communications

The USSR communications facilities are capable of meeting the minimum requirements imposed by war in the western area of the USSR. Most important, they are adequate for the support of an air defense system in the western area. The communications system includes a radio system which is well developed and closely integrated with the wire system. The total facilities are relatively secure.

While satisfying current needs of the USSR, the eastern system is not adequate for the full support of large-scale military and air defense operations and is relatively insecure.

The development and modernization of the communications system is a major objective of the USSR technical program but by mid-1951, the communications capabilities will not have changed significantly.

1.10 Submarine Characteristics

It is improbable that the Walter or other closed-cycle propulsion processes will be developed beyond the trial stage in mid-1951. It is not probable that the Soviets will have operational submarines with deeper-diving characteristics than the German Type 21 by that date.

1.11 Influence Mines

By mid-1951 the Soviets will have available copies of all operational World War II German influence mines. In addition, it is possible that any combination of pressure, magnetic, and acoustic actuation systems under development by the Germans at the end of the war may be in production.

1.12 Torpedoes

By mid-1951, the Soviets will have available copies of all operational World War II German torpedoes with pattern-running devices, wire-control, active and passive homing heads, etc.

1.13 High-Speed, Elusive Surface Craft

By mid-1951, hydrofoil surface craft will probably not have progressed beyond the prototype improvement stage.

2. The following is an estimate of Soviet capabilities to employ new weapons in the event of a major war in 1954. It should be noted that while the estimates for each weapon are considered to be reasonable, there is some doubt that the total Soviet research, development, and production capabilities will permit the estimated performance on all weapons simultaneously. Thus, the estimates presented below are probably maximum, and will be realized to varying degrees depending on the priorities of Soviet programming which are at present largely unknown.

2.1 Atomic Bombs (AW)

2.1.1 Production. The integration of the available information in the light of the August 1949 atomic explosion in the USSR does not produce a very meaningful estimate of Soviet atomic capabilities as of mid-1954. However, if the simplest types of atomic bombs developing roughly 20 kilotons explosive power are assumed for calculation, the Soviet atomic bomb stockpile in mid-1954 is estimated to be from 120 to 200 bombs.

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2.1.2 Research and Development. There is essentially no information on Soviet atomic bomb research, but it is probable that they will have developed an atomic warhead for guided missiles. The present Soviet heavy water program will provide certain essential raw materials for the development of a thermo-nuclear bomb. If this development is prosecuted vigorously, it is possible that they may produce a thermo-nuclear bomb by this time. However, there is no basis now for estimating the number of thermo-nuclear bombs, if any, that may be available in mid-1954.

2.2 Radiological Warfare (RW)

The USSR will have the basic facilities for the production of small quantities of radiological warfare agents in mid-1954, and may have the facilities for the production of large quantities (tens of megacuries) of RW agents, depending on where the emphasis is placed in the construction of facilities between now and mid-1954.

2.3 Biological Warfare (BW)

By 1954, the Soviets may have expanded their facilities for bulk production of BW agents sufficiently to permit large-scale biological warfare. They will probably have devised new agents and techniques for BW sabotage. Soviet developments in BW detection and defense probably will not have developed far enough to give the USSR effective protection against BW attack from other nations. This consideration may limit the circumstances under which the USSR would employ BW.

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2.4 Chemical Warfare (CW)

By mid-1954, the Soviet Union should be capable of producing nerve gases (G-Agents) in sufficient quantity for large-scale employment.

2.5 Guided Missiles

Based on extrapolation from very meager evidence, the following estimate is made of the production of guided missiles in limited quantities for operational use up to 1954:

2.5.1 Surface-to-Surface. V-2 missiles with greatly increased accuracy by 1952.

2.5.2 Surface-to-Air. Wasserfall-Schmetterling missiles available in 1952 with limited accuracy employing V-T fuzes; improved accuracy by 1954 with homing head added.

2.5.3 Air-to-Air. Various adaptations of the German X-4 and Hs-298, probably will be available in 1952, but with poor accuracy.

2.5.4 Air-to-Surface. It is possible that by 1954 the Soviets will have available for operational use on a limited scale an air-to-surface missile with accuracy comparable to similar missiles now under development in the United States.

2.6 Proximity Fuzes

For the reasons discussed under the 1951 estimate in Part 1 it is reasonable to assume that by 1954 the Soviets should have relatively sophisticated and rugged proximity fuzes in quantity production.

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2.7 Radio-Countermeasures

2.7.1 In addition to the reflector jamming techniques mentioned in Part 1 above, by 1954 electronic jamming techniques will probably have been extended up to the 10,000-mc band.

2.7.2 It is considered likely that the Soviet jamming of the Voice of America broadcasts mentioned in Part 1 is directed ultimately toward serious disruption of international radio telecommunications. By 1954, therefore, it is possible that the Soviets could seriously disrupt international telecommunications without affecting their own communications systems.

2.8 Radar

2.8.1 Early Warning Systems (EW). Assuming reasonable progress in the development of microwave equipment, the early warning networks discussed in Part 1 should provide good low-altitude coverage by mid-1954.

2.8.2 Air Intercept (AI). By mid-1954, the USSR will probably have active AI equipment operating at X-band in unknown numbers in quantities limited only by aircraft and trained personnel.

2.8.3 Ground Controlled Intercept (GCI). By 1954, trained personnel and equipment will be adequate to permit radar direction of substantially all fighter operations.

2.8.4 Fire Control Systems. The production of additional copies of the radar fire control equipment mentioned in Part 1 may make possible radar directed antiaircraft fire in all areas of military importance by 1954.

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2.9 Communications

Given three and one-half additional years for development, the communications system will be considerably strengthened in all respects. As a natural corollary of the USSR's jamming program, wire communication will have undergone the greatest development and play a more important role, particularly in the west. As a consequence, the entire system will be much more secure and traffic-handling capacity will be much increased, but by mid-1954, the eastern system will still be relatively weak. The system covering Western USSR will be almost fully developed and modernized on the principal routes.

2.10 Submarine Characteristics

By mid-1954, the true "submarine" should be achieved by USSR through successful completion of current propulsion plant experimentation. Operating depths and speeds will have increased noticeably to make the Soviet submarine a much more difficult weapon to combat than at present.

2.11 Influence Mines

By mid-1954, the current mine development program in the USSR should have produced further refinements in actuating systems but no fundamental changes in mine design.

2.12 Torpedoes

By mid-1954, Soviet torpedoes will be improved in range, speed, reliability, and selectivity, but few fundamental changes are anticipated.

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2.13 High-Speed, Elusive Surface Craft

By mid-1954, hydrofoil surface craft should have been developed in the USSR to the point of being operationally important.