

13 JAN 1960

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MEMORANDUM TO HOLDERS OF NIE 11-5-59

SOVIET CAPABILITIES IN GUIDED MISSILES AND SPACE VEHICLES

CIA HISTORICAL REVIEW PROGRAM
Release in Full 1998

1. The Director of Central Intelligence, with the participation and the concurrence of the United States Intelligence Board, has undertaken a review of all evidence relating to the accuracy of the Soviet ICBM as set forth in NIE 11-5-59, "Soviet Capabilities in Guided Missiles and Space Vehicles," 3 November 1959 (TOP SECRET), and has concluded that paragraphs 6, 78, 79 and the Summary Table (page 39) should be revised to read as follows:

6. We estimate Soviet ICBM guidance at IOC date as a combination radar track/radio command/inertial system which is called "radio-inertial," although an all-inertial system is possible. Soviet capabilities in related components at IOC point to a *theoretical* CEP of about 2 n.m. with the radio-inertial system. The Soviets probably will incorporate the all-inertial system in their ICBM sometime during the 1960-1962 period and, should they adopt this system in 1960, they could achieve a *theoretical* CEP of about 3 n.m. The data available for estimating both the above *theoretical* CEPs are far from exact. The precise amount of degradation which would be introduced by operational factors is unknown, but we estimate a CEP under operational conditions at IOC date of about 3 n.m. with the radio-inertial system; with an all-inertial system the operational CEP in 1960 would be about 5 n.m. We further believe that the Soviets will be able to improve the accuracy of their ICBM following IOC, and that over the next few years, and probably not later than during 1963, the operational CEP for an all-inertial system could be reduced to about 2 n.m., and the operational CEP of the radio-inertial system would be somewhat better.*

- * The Assistant Chief of Staff for Intelligence, Department of the Army, believes that this re-examination which resulted in the estimated better Soviet ICBM accuracy either reflects, or was suggested, by recent US ICBM test experience which caused certain members of the USIB to revise their judgment as to the validity of the most recent intelligence study of this problem conducted for the USIB by the Guided Missile and Astronautics Intelligence Committee (GMAIC). The Assistant Chief of Staff for Intelligence, Department of the Army, recognizes that it is prudent to estimate that the Soviets would sooner or later, if not currently, possess an ICBM system of an accuracy comparable to that of the US ICBM. However, at present, he perceives no justification for abandoning the estimates derived from so recent an analysis of all available technical intelligence information. A further significant consideration is that estimates of *operational* accuracy are based on *theoretical* degradation of test range performance which further increases the uncertainties in such estimates. Accordingly, it is believed that there is no present intelligence basis for changing the conclusions as to operational accuracy as contained in the GMAIC report and, therefore, that the more likely range of *operational* accuracy for Soviet ICBM at IOC, using "radio-inertial" guidance, is on the order of a 3-5 n.m. CEP; that by sometime in 1963, with the all-inertial system, the CEP could be reduced to 2.5 n.m., although the operational CEP of the "radio-inertial" system would be somewhat better.

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78. We estimate ICBM guidance at IOC date as a combination of radar track/radio command/inertial which is called "radio-inertial," although an all inertial system is possible. Soviet state of the art in precision radars, gyroscopes and accelerometers leads us to estimate a *theoretical* CEP at IOC of 2 n.m. at 5,500 n.m. range for the radio-inertial system. We believe the Soviets probably will incorporate the all-inertial guidance system into their ICBM sometime during the 1960-1962 period (see paragraph 79) and could in 1960 achieve with this system a *theoretical* CEP of about 3 n.m. The data available for estimating both the above *theoretical* CEPs are far from precise. Further, under operational conditions the *theoretical* CEPs will be degraded by several factors, such as (a) re-entry errors induced by undeterminable winds and air density over the impact area; (b) geophysical errors;¹ and (c) human and experience factors. The amount of degradation which would be introduced by such nonguidance system errors cannot be firmly fixed, but we estimate that the operational CEP at IOC date for the radio-inertial system would be about 3 n.m. Should the all-inertial system be introduced in 1960, it could have an operational CEP of about 5 n.m.²

79. We further believe that the Soviets will be able to improve the accuracy of their ICBM following IOC, and that over the next few years, and probably not later than during 1963, the operational CEP for and all-inertial system could be reduced to about 2 n.m., and the operational CEP of the radio-inertial system would be somewhat better.* Units already equipped with radio-inertial guidance probably would not be retrofitted with all-inertial system.

Change to Summary Table (page 39): delete present entry on ICBM accuracy and insert new statement, "See paragraphs 78 and 79."

A similar review of the evidence relating to ICBM reliability has led to the conclusion that Table I (page 22) of the subject estimate should also be revised. We have concluded that the inflight reliability, that is, the missile's reliability after leaving the pad, lies in the range between 55 percent and 75 percent at IOC as opposed to the 60 percent now appearing in the Table. We further conclude that inflight reliability at IOC plus three years lies in the range between 70 percent and 85 percent as opposed to 75 percent now in the Table. Within these ranges the Assistant Chief of Staff for Intelligence, Department of the Army and the Assistant Chief of Naval Operations for Intelligence, Department of the Navy believe the reliabilities in question lie at the lower ends; the Assistant Chief of Staff, In-

¹ Geophysical errors include gravitational anomalies, geoidal uncertainties, and uncertainties of target location relative to launch point and local verticals.

² See the Assistant Chief of Staff for Intelligence, Department of the Army, footnote to paragraph 6.

* See the Assistant Chief of Staff for Intelligence, Department of the Army, footnote to paragraph 6.

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telligence, USAF estimates that the reliabilities lie at the upper ends and herewith withdraws his footnote on page 23 of the subject estimate. Note that figures in the Table regarding "in commission rate" and "on launcher reliability" are unchanged.

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