OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON, D. C. 20301

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18 JUN 1970

Dr. Donald H. Steininger
Asst. Deputy Director for
  Science and Technology
Central Intelligence Agency
Washington, D. C. 20505

Dear Dr. Steininger:

This letter summarizes a study activity we would like to have performed by
TRW [   ] on the effectiveness of U.S. Ballistic Missiles.

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I have designated Mr. Kenneth W. Whitt (OX 5-7181) as the DDR&E Threat
Assessment Office Project Monitor for this contract. He will continue to
work closely with his CIA counterpart(s) as designated by your office.

In consonance with our working agreement, DDR&E would like to task TRW
[   ] to conduct the following studies, in the order listed, on a best
effort basis during FY 1971:

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 1. ABM Capability of Soviet SAM and Upgraded SAM Systems.

   Study Objectives: To determine the capability of the SA-5 system
(and SA-2 and SA-1, if warranted) to acquire, track and intercept current
and proposed U.S. land and sea-based ballistic missile RVs. To delineate
the technological strengths and weaknesses of the RV and SAM systems.

   Study Background: During the past two years there have been
numerous studies which examined the ABM capability of the Soviet SA-5
system. These studies, individually, were generally deficient in one form
or another (e.g., lack of all-source intelligence, poor scenarios, inaccurate
Blue systems characteristics, etc.). TRW is requested to review these past
studies (supplied by DDR&E) dealing with potential ABM capabilities of the
SA-5 and assess the SA-5's capability to intercept (endoatmospherically)
MK 11 A, B, C, and D; RVs; MK 12 RVs; and POLARIS A-2, A-3 and POSEIDON RVs.
TRW should examine the opportunity to acquire RVs using the booster as an
acquisition aid (if applicable) or using chaff deployed as a PENAID. The
study should examine the U.S. currently deployed RVs first, and then examine
proposed RVs for missile systems currently in R&D.

   The Soviets, historically, have been extremely concerned with the
aircraft threat to their homeland. This threat, at the time of the SA-5
design, was probably identified as being aircraft and air-to-surface missiles

OSD REVIEW COMPLETED

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which would penetrate Soviet airspace at very high altitudes and supersonic speeds. For example, the threat would include the B-70, B-58 and the Skybolt missile. Given these parameters then, a design of the SA-5 system can be postulated. Regarding the missile, the uncertainties of the design will imply or permit a range of performance and size of the missile within the physical constraints imposed by photography. Similarly, the Square Pair Radar design are photographically limited since other information is almost non-existent. However, the design against the postulated threat could be a CW, track-while-scan or perhaps other type of radar, all of which should have adequate power and discrimination for high altitude, supersonic raids.

Additionally, one should consider whether the Soviets would have placed additional criteria on the SA-5 designs. For example, might the radar and intercepter have had to operate against the U.S. THOR, JUPITER or sub-launched and land-based ICBMs. What design modifications would be required for the SA-5 system to operate against all of these threats?

2. U.S. POLARIS/POSEIDON RV penetration capability against Moscow-type ABM Systems.

Study Objective: Determine the capability of U.S. POLARIS A-2, A-3 and POSEIDON RVs to penetrate the Moscow-type ABM as currently defined and then including impending improvements which might be made to the system. Delineate technological strengths and weaknesses of the RVs and the ABM system.

Study Background: This study is a continuation of the study that was conducted during FY 70 which examined the MINUTEMAN penetration capability against the Moscow ABM system. All of the necessary Blue weapon systems technological capabilities will be supplied TRW by ODDR&E. Results of advanced RV discrimination sensors (e.g., LWIR experiments) will be provided TRW by DDR&E.

3. Influence of SLBM Launch Area Surveillance Sensors on Terminal Area ABM and Upgraded SAM Systems.

Study Objectives: Determine to what degree the effectiveness of Soviet ABM and SAM systems might be improved by Soviet SLBM launch area surveillance sensors assuming the sensors could provide (in near real time):

    a. Firing azimuth information.

    b. Burnout velocity information.

    c. Launch location and launch time.

Study Background: Because the number of SLBM launch platforms are relatively few (e.g., 18 - 20) it may be possible to significantly enhance ? capabilities of ABM and upgraded SAM systems by (1) making an SLBM attack ed by disrupting FBM communications; and (2) providing target information ? defense which might enable it to significantly blunt the effectiveness
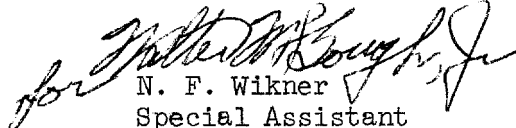
of the attack. We would like to determine how valuable that information about launch location, time, azimuth and burnout velocity might be to the Soviet ballistic missile defense systems, particularly SAM systems.

4. USSR RVs versus SAFEGUARD ABM System

Study Objective: Determine the capability of the modified Soviet SS-11 RV, SS-9 MRVs and SS-13 RV to penetrate the SAFEGUARD ABM System. Delineate technological strengths and weaknesses.

Study Background: This problem is the "mirror image" of that outlined in Task 2. SAFEGUARD system characteristics will be provided TRW by ODDR&E.

Finally, we would appreciate it if TRW would submit a proposal, referencing the above tasks, by 15 July 1970 in order that we might begin the allocation of FY 71 funds. If I can provide additional information regarding tasking or funding, please contact me.

for N. F. Wikner
Special Assistant
(Threat Assessment)