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PROJECT

CHALICE

TOP SECRET**U-2 Vulnerability Tests**

Vulnerability of the U-2 was tested against the F-102 and F-104 fighters at Eglin AFB in December 1958. The tests were conducted under optimum controlled ground and air environment for the attacking pilot (i. e., outstanding pilots, isolated air space, ideal weather, pre-selected intercept point, etc.). The F-104 cannot cruise at altitudes over 60,000 feet, but it possesses a capability to convert speed to altitude and attain co-altitude of the U-2 for a period of less than 30 seconds. The F-104 was equipped with air-to-air missiles of the infra-red seeking variety and airborne radar that locates the aircraft and allows the pilot to visually acquire the target to complete the attack. The F-104 radar malfunctioned at high altitudes. The pilot of this fighter could not visually acquire the target in sufficient time to solve the fire control problem. The F-102 all weather fighter consistently acquired the target and was able to solve the fire control problem for launching air-to-air missiles. To be successful, the missiles require outstanding high altitude performance and a slant range in excess of five miles.

The performance of both aircraft exceeded the present capability of operational Soviet fighters. The standard operational Soviet fighters cannot attain co-altitude of the U-2. A new fighter, the Fitter, of which an estimated 120 have been produced, is considered capable of co-altitude for a period of several seconds. It is not, however, presently considered operational. The standard Soviet all weather fighter, YAK-25/Flashlight, is considered capable of acquiring the U-2 on airborne radar. However, to complete a successful intercept would require an air-to-air missile with a slant range in excess of seven miles. The USSR is considered to have air-to-air missiles, however, there is no intelligence source that indicates that the missiles are operational.

Conclusions

1. The F-104 can attain co-altitude, but the difficulty in visually acquiring the target makes any single attack a low probability of successful intercept.
2. The F-102 with its radar can acquire the U-2 and possesses the performance to solve the fire control problem, however, air-to-air missiles of outstanding performance and long range are required to accomplish airborne intercept. There is no known operational deployment of air-to-air missiles by the Soviets.
3. Successful intercept of the U-2 by the Soviet defensive fighters for the next few months is unlikely.

TOP SECRET

TOP SECRET EYES (CHESS)

SC-02040/59

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31 March 1959

THE CRITICAL NEED FOR CHALICE COLLECTION

The major threat to the security of the United States and the West, stems increasingly from Soviet guided missiles.

Intelligence is ignorant as to whether or not any are now deployed or are soon to be deployed; we know nothing of the pattern, method or location of deployment.

Neither do we have good evidence as to nature and location of production facilities.

Thus we are unable to give adequate judgments as to magnitude and timing of the missile threat, or to give data to the Strategic Air Command for its use in attempting neutralization.

The Soviets claim that the power balance vis-a-vis the United States is changing. We believe that if this is true the missile factor is the key.

TOP SECRET EYES (CHESS)

TOP SECRET EIDER GHESS

SC-02040/59

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31 March 1959

THE CRITICAL NEED FOR CHALICE COLLECTION

The threat to the security of the United States and the West stemming from our ignorance of Soviet guided missile production and deployment is judged to be a more serious risk than that attendant on overflight operations to obtain the information we sorely need. This is the view of the United States and British intelligence communities as well as of outside consultants, the Hyland Committee.

The Soviets claim that the power balance vis-a-vis the United States is changing. We believe that if this is true the missile factor is the key.

TOP SECRET EIDER GHESS

ICBM TARGETS -- THE URALS AND TYURA TAM

There is no information available on the pattern or the whereabouts of ICBM deployment though the suspicion that ICBMs are being deployed is very strong. From analysis of TYURA TAM photography we strongly suspect that deployment is geared to major railway lines either for logistical support to hardstands or launch from trains themselves or both. The most likely area for ICBM launch site deployment satisfying this requirement, along with those of maximum security from observation and proximity to production areas, is the Urals. Recent analysis of COMINT traffic which supports a covert agent report shows a guided missile associated activity in the vicinity of VERKHNAYA SALDA just off major rail lines 75 miles north of SVERDLOVSK. Beyond these two leads our objective would be to obtain coverage of major rail lines in the Urals.

A critical target area bearing on the missile question is TYURA TAM, coverage of which is now twenty months old. Today the suspected second launch site there with its hooked rail line is probably complete with telltale appurtenances which may suggest deployment schemes. Training may well be going on in preparation for deployment. The out-sized launch pad exceeds the requirements for launch of any ICBM or earth satellite vehicles extant. Coverage of the rangehead could give us valuable leads or outright evidence of their plans and capabilities in the ICBM field.

Khrushchev claims that the USSR is in series production of ICBM, that the Soviets already have a mobile capability with IRBM and will shortly have with ICBM. We have no information to confirm or deny this. We do have a covert report confirmed in part by COMINT analysis that SVERDLOVSK in the Urals is the best bet on the location of a major ICBM factory. We might well obtain key information from photography that would lead us to a sound appraisal of production.

Under present staging plans the foregoing highly critical targets could be covered in a single mission with very significant additional benefits from bonus coverage of highly critical nuclear weapons targets, namely, VERKHNE NEYVINSKIY, NIZHNYAYA TURA, and KYSHTYM.

Number of days that 2/8 or less cloud cover may be expected to be found at 1300 Local time at selected targets.

Targets	April	May
NE Half of RR including Polyarnyy Ural	3	2
SW Half of RR	2	2
Entire RR and Polyarnyy Ural	1-2	1-2



— URAL RR'S

This map shows the approximate use-fire line between India and Pakistan forces in Jammu and Kashmir whose status...

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SC-02038/59

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31 March 1959

ICBM -- POLYARNYY URAL AREA

1. Soviet ICBM deployment techniques and methods are not known although we have some evidence that rail mobility is an ICBM requirement. We consider the POLYARNYY URAL area, suspect almost equally with the Urals area, as likely for critical information on the missile launch problem.
2. The reasons for our suspicion are as follows:
 - a. Special Intelligence indicates unusual activity involving personnel and materials which are known to have been associated with the guided missile activity at TYURA TAM and KLYUCHI, a known ICBM test range.
 - b. Geographical orientation towards the United States is excellent for deployment of operational ICBM.
 - c. The rail line running between MOLOTOVSK and KOTLAS and VORKUTA is situated so that it may provide mobile rail launch against the United States or it would provide direct rail support for ICBM hardstands at POLYARNYY URAL.
 - d. Photography during construction of operational hardstands (which we suspect is now in progress) would be critical as compared to less revealing photography after operational sites have been covered over.
 - e. Whether the Soviets are going in for mobile or fixed launch of ICBMs or both could be indicated from coverage. Both our estimates and our guidance for further collection would be greatly affected by hard information on this question.
3. A mission to the POLYARNYY URAL area could also include as bonus another important highest priority target, MOLOTOVSK (SEVERODVINSK). MOLOTOVSK is surrounded with extraordinary security precautions. Intelligence from all sources is fragmentary but points to our current estimate that this largest ship construction facility in the USSR is probably constructing either guided missile or atomic powered submarines, or a combination of both. To date, we have at best probable identification of two guided missile configured Zebra-class submarines from photography at POLYARNYY in the KOLA Gulf. It may well be that photography of MOLOTOVSK could provide significant data bearing on submarine capabilities.

TOP SECRET EIDER CHESS

Number of days that 2/8 or less cloud cover may be expected to be found at 1300 local time at selected targets.

Targets	April	May
Nizhnaya Tura	5	4
Sverdlovsk	8	4
All East Targets	3	2
Railway West Side	5	3
All targets on both sides of Urals	2	2

SECRET

USSR
SOVIET



— URAL RR'S

■ MISSILE TEST RANGE AREAS

This map shows the approximate cease-fire line between India and Pakistan in Jammu and Kashmir which is not shown.

TOP SECRET

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SC-02039/59

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31 March 1959

ICBM -- TYURA TAM

A critical target area bearing on the missile question is TYURA TAM, coverage of which is now twenty months old. Today the suspected second launch site there with its hooked rail line is probably complete with telltale appurtenances which may suggest deployment schemes. Training may well be going on in preparation for deployment. The out-sized launch pad exceeds the requirements for launch of any ICBM or earth satellite vehicles extant. Coverage of the rangehead could give us valuable leads or outright evidence of their plans and capabilities in the ICBM field. Coverage of instrumentation points in the down-range area could be extremely valuable. Previous coverage of such instrumentation points with a lesser capability, namely the A-2 photo configuration, permitted detailed analysis and gave critical guidance for COMINT collection.

TOP SECRET EIDER CHESS

Number of days that 2/8 or less cloud cover may be expected to be found at 1300 local time at selected targets.

Target	April	May
Tyula Tam	13	12
Lake Balkash	12	10
NRN Telemetry Station	13	13
All targets	7	6

Robert I
by dog
airplane
Mobile I
under Otto
a camp-
months

Russian and Polish boundaries are according
to treaties and claims as of January, 1951.

Meridian of Greenwich

NORWEGIAN
ARCTIC CIRCLE

NORWEGIAN
SEAS

BARENTZ
SEAS

FRANZ JOSEF LAND
U.S.S.R.

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POLYARNYY
URAL RR'S

