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CENTRAL INTELLIGENCE AGENCY
PHOTOGRAPHIC INTELLIGENCE DIVISION
PHOTOGRAPHIC INTELLIGENCE REPORT

SUSPECT GALOSH LAUNCH SITE
FROM
"ROCKETS ON GUARD FOR PEACE"
(SOVIET SOURCE)

CIA/PIR-1014/65

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GROUP 1
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CIA, PHOTOGRAPHIC INTELLIGENCE DIVISION

SUSPECT GALOSH LAUNCH SITE
From
"ROCKETS ON GUARD FOR PEACE"
(SOVIET SOURCE)

The Soviet film "Rockets on Guard for Peace" shows what probably is the launching of a Galosh missile from a launch point in the vicinity of a self supporting lattice-tower. This report concerns the analysis of this film and KEYHOLE photographic coverage of the Soviet Union, with the view of identifying the specific launch position used to launch the missile.

The following facts and assumptions bear on the problem:

Facts

(1) The Soviet film reveals a missile being launched from a container which closely resembles the Galosh container revealed in recent Moscow parades.

(2) The container cover pops off prior to the launch of the missile, and during the filmed sequence flies in an arc behind the adjacent tower, thus revealing that the tower is closer to the camera than the erected missile.

(3) Smoke and dust, resulting from the missile's deflected jet, billow quickly outward and engulf the tower in two to three seconds of film time.

(4) The tower shown in the movie is a lattice, self supporting tower with square or rectangular platform mounted on top.

(5) Known launch facilities were examined on KEYHOLE photography and it was found that self supporting lattice towers with rectangular or square platforms can be found near a number of launch positions. These include positions at Kapustin Yar, Tyuratam, and Sary Shagan.

Assumptions

(1) The launch filmed by the Soviets occured during a time frame which permits use of recent high quality KEYHOLE photography in this analysis.

(2) The Soviets projected the film in the correct orientation, and did not edit the film. In other words, the film was not projected with a single mirror reversal.

(3) The missile container, erected for launch, was elevated so the bottom of the container was 5 feet above the launch pad surface.

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(4) The base of the lattice tower appearing in the Soviet film was at the same elevation as the surface of the launch pad.

(5) The camera used to produce the Soviet movie sequence of the Galosh launch was equipped with a telephoto lens, which had the effect of equalizing the photographic scale due to foreshortening.

(6) The missile launched was a Galosh, with container similar in size to that photographed during the recent Moscow parade.

Discussion

It is important to first determine which of the possible launch positions are the most likely locations for the Galosh launch, by rejecting those which have towers of the wrong height or configuration. With this in mind, a Kapustin Yar launch facility (Launch Complex A, Site 2-A (South) is ruled out because the towers are not properly configured. (See Figure 6, NPIC/R-1186/64). Tyuratam launch pads G-1 and G-2 have towers which fit the general configuration of the Soviet movie film tower, however these facilities do not appear to be a likely candidate for the launch of a Galosh type missile in view of long association of Tyuratam with the launch of surface to surface missiles, and the detection of a 95 foot long erected missile at pad G-2 [redacted] Thus the two remaining candidates are Launch Complex A and Launch Complex B at Sary Shagan Anti-missile Test Center. 25X1

Launch Complex B candidate launch positions are located between Facility B and Facility C (The Building Triad), and are located on loop roads which were constructed after the building triad was started, and are here designated "Facility D".

Launch Complex A candidates include launch sites 5 and 6 and launch position 5, launch site 3.

Complete mensuration of all suspect towers was accomplished by NPIC/Technical Intelligence Division. This mensuration included the Soviet movie photography on the basis of the assumptions stated above.* Attachment 1 contains the mensuration from the Soviet movie.

*NPIC/TID Accuracy statement: Heights determined from KEYHOLE photography were determined from shadows and many shadows were difficult to point to. Widths were also measured from the shadows.

Accuracy: Widths: [redacted] or 10 percent whichever is greater 25X1
Heights: plus or minus 5 feet or 10 percent whichever is greater

A meaningful accuracy statement could not be made regarding the Soviet TV film "Missiles on Guard for Peace".

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The tower dimension at Launch Complex A are as follows:

Launch Site 5
Height: 90 feet
Maximum width:
Width of platform on top: 15 feet

Launch Site 6
Height: 90 feet
Maximum width
Width of platform on top: 15 feet

Launch Site 3
Height: 130 feet
Maximum width: ee Footnote
Width of platform on top:

Attachment 2 shows the location of the tower and select distances The unidentified object in the lower right corner of the line drawing is approximately 10 feet high and has been a speculative candidate for the location of the camera station from which the launch was photographed.

The tower dimension at Launch Complex B as well as other outstanding features in the area for orientation purposes are depicted on the line drawing Attachment 3. This line drawing nor Attachment 2 should be considered complete portrayals of features seen at these locations. Complete drawings would be produced during a detailed analysis of the entire installation.

Launch Sites 5 and 6 at Launch Complex A are ruled out due to the type of missile (Griffon) which has been associated with the specific launcher found in front of the curved missile ready buildings. The Galosh missile would be grossly out of place at either of these two launch sites. Consequently, this leaves only two launch areas for consideration, in view of the known facts: Launch Complex A, Launch Site 3, position 5 and Launch Complex B, Facility D.

Attention is now invited to Attachment 1, which is the photogrammetrists

* The photo analyst takes exception to this measurement, and believes the tower is considerably wider at the base. The first good measurement of width can be made approximately above the base of the tower, and at that point the tower width is approximately 15 feet wide. This particular measurement was made by the CIA/PID project analyst, using scale factors derived from NPIC/TID measurements. It should not be construed as being mensuration data compiled by the NPIC/Technical Intelligence Division.

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analysis of the Soviet movie, "Missiles on Guard for Peace". The basis for measurement on individual frames of the sequence in question was the assumption that the missile being launched in the movie was the Galosh missile, and that the container shown had the same dimensions as that of the Galosh missile containers seen in the recent Moscow parade (65 feet long [redacted] 25X1
It was further assumed that the container was erected so the bottom was 5 feet above the surface of the launch pad, and that the base of the tower seen in the movie sequence was at the same level as the launch pad surface. (See Attachment 1). A further assumption is that the taking camera had a telephoto lens of sufficient focal length to create fairly similar image scales at the focal plane. A final assumption was that the portion of the tower not visible in the movie consisted of a regular continuation of the lattice members, with no unusual flare below the [redacted] These assumptions have been arrived at with 25X1
an intent to create a reasonable basis for analysis. For example, proximity of the perspective ray from camera to tower and from camera to missile indicates that the distance from each to the camera must be different. This is a reasonable conclusion because if they were the same distance away, the missile would be launched dangerously close to the platform on top of the tower. The movement of the container cap behind the tower confirms that the tower must be closer to camera than the missile. The envelopment of the tower in a cloud of dust and smoke in approximately 2 to 3 seconds of film time also suggests that distance of the tower from the launch position is not great. Though combustion particles are expelled at supersonic speed from the rocket engine, they quickly and progressively slow down to subsonic speeds on hitting the atmosphere. Wind speed and direction at the time of launch would not substantially effect the time of arrival of the dust cloud provided the distance was not great and the wind speed was not severe. The latter is probably not likely in a developmental launch.

The tower at Launch Complex A, located adjacent to launch position 5, has a height which makes it a good candidate. It is not clear, however, whether a platform is mounted on top of this tower. A suspect square shape can be seen at the top of the tower itself, but only on one of the two photographic exposures [redacted] and a considerable amount of radial displacement 25X1
introduces a complicating factor. This square shape measures approximately 14 feet wide. The shadow of the tower and whatever object is mounted on top, does not confirm the presence of a platform. However, it must be realized that the shadow is not falling on perfectly flat ground; in any case some room for doubt exists regarding the shadow analysis.

Three lattice towers near the westernmost launch position at Launch Complex B, Facility D, are candidates. Each of these towers has a prominent object mounted on top. See Attachment 3. The tower annotated (1) has a probable platform, measuring approximately [redacted] however it is not possible to 25X1
determine if it is square or rectangular. The tower at annotation (2) possibly has a similar platform, however the shadow falls on or very near to rough ground which does not permit a meaningful measurement. The tower at (3) also has a

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possible platform, however, it appears to be a few feet smaller than the platform at (1). The towers adjacent the eastern loop road at Facility D are too small to be considered good candidates.

The evidence favoring Launch Complex A, Launch Site 3, Launch Position 5 is as follows:

1. The height of the tower.

2. Presence of a suspect platform, having a reasonably similar dimension.

3. Reasonable proximity to the suspected location of the Galosh launch.

The evidence which probably negates Launch Complex A, Launch Site 3, Launch Position 5 is as follows:

1. The tower is too wide at the 50 foot elevation, even with a reasonable margin of error.

The evidence which tends to favor Launch Complex B, Facility D, West Launch pad, is as follows:

1. With the possible margins of error applied, the height of the lattice towers is reasonable, and platforms are present.

2. With a Galosh on the west launch pad, and inclined toward impact areas to the west, the tower annotated (2) could be the tower in the movie sequence, if the missile were erected on the portion of the pad east of the [redacted] unidentified structure or equipment and the camera was located someplace in the area just west of the western half-moon position at Facility B.

3. With margins of error applied, the width of the towers at Facility D, Launch Complex B, is reasonably similar to the width of the tower shown in the Soviet movie.

4. The close proximity of the towers to the launch pad, between 100 and 150 feet (depending on exactly where on the pad area the missile was erected).

5. The wide tower at Launch Complex A tends to leave no strong contender.

The evidence which causes some doubt about Facility D, Launch Complex B is as follows:

1. The close grouping of towers around the launch pad. It seems as if one of the other towers would appear in the picture format, yet in the Soviet movie there is no evidence of other towers in the background.

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2. The loop road launch positions at Facility D were possibly constructed with the view of working in conjunction with the electronics being installed at the Building Triad (Facility C). The latter facility continues to show evidence of construction activity, despite the fact the structures appear externally complete. If the building triad is not operational, it would seem that the launch positions at Facility D might not be used.

Conclusions

The mensural evidence against Launch Complex A, Launch Site 3 as the launch site for the Galosh in the Soviet movie seems to be fairly conclusive, thus leaving Launch Complex B, Facility D as the most likely candidate by default. Nevertheless, Launch Complex B has strong evidence in its favor as well. As regards the negative evidence mentioned above, it is believed that a proper viewing angle and the use of a telephoto lens would permit photographing a launch from the western pad at Facility D, with only one tower in the picture, and that tower to the right of the camera axis while the missile was generally left of the same axis, and at the same time exclude the other towers from the picture format. As for the operational status of the building triad, it is not possible to negate this point. The tower on top of the large building had a dish mounted on top as early [redacted] The eastern loop at Facility D was present as early as May 1962 and was possibly under construction in July 1961. An outline of the western loop was first evident [redacted]

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Nevertheless, in view of the many assumptions required to accomplish this project, it is not possible to use a stronger term than "suspect" location of the Galosh launch (See Attachment 3) at Facility D, Complex B.

REFERENCES

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[redacted]

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CIA, PHOTOGRAPHIC INTELLIGENCE DIVISION

MAPS

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USATC Series 200 sheet 245-9 (SECRET)
USATC Series 200 sheet 235-22 (SECRET)
USATC Series 200 sheet 246-13 (SECRET)
USATC Series 200 sheet 236-22 (SECRET)

DOCUMENTS

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CIA/PIR-1004/65

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CIA/PIR-13/64

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REQUIREMENT

C-RR5-82,622

CIA/PID PROJECT

30738-5

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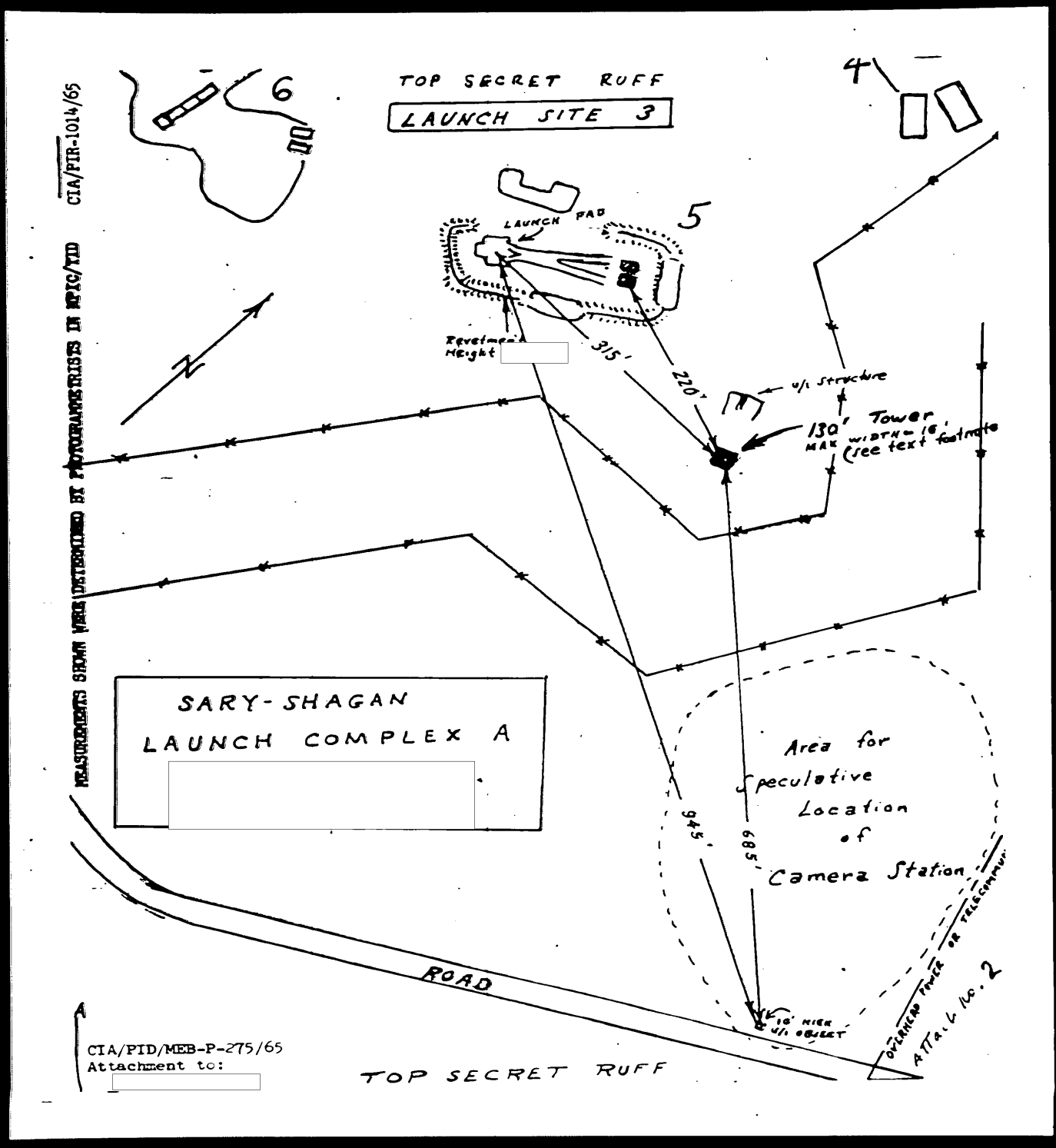

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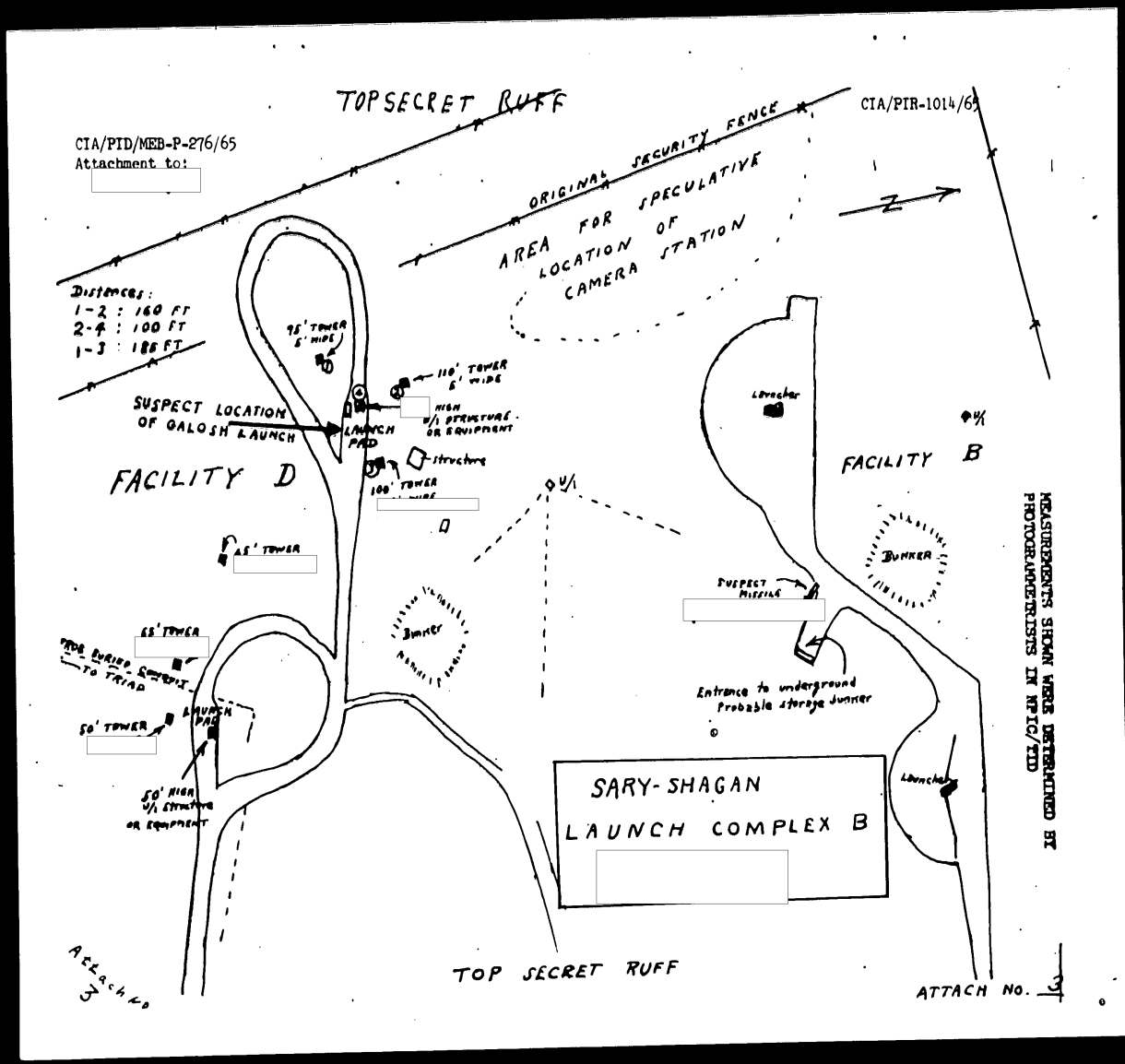

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