25X1C [redacted] SECRET

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PHOTOGRAPHIC INTERPRETATION REPORT

ANALYSIS OF SOVIET MANNED SPACE FLIGHT LAUNCH FACILITIES

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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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ANALYSIS OF SOVIET MANNED SPACE FLIGHT LAUNCH FACILITIES

Several Soviet sources have been evaluated and analyzed to determine what information could be obtained on the site of the launching of the manned Soviet space flights. The most valuable of these sources were the Soviet documentary films First Voyage to the Stars and Again to the Stars on the flights of Yuri Gagarin and Gherman Titov. Issues of the Soviet magazines USSR and Soviet Union also provided material of some value.

Considerable care was exercised in the reconstruction and determination of placement and sizes of objects, but none of the factors involved can be considered exact. More accurate measurements, better views of the hardware, or other indications of operations would all render the reconstruction shown in Figure 1 more accurate. This reconstruction and others in the report should be considered only as tools for further analysis and not as representations of actural hardware or operational techniques. Further analysis of the material may suggest operational procedures other than those presented here.

The information contained in this report has been prepared on the following three levels of reliability in an effort to present all pertinent data as objectively as possible:

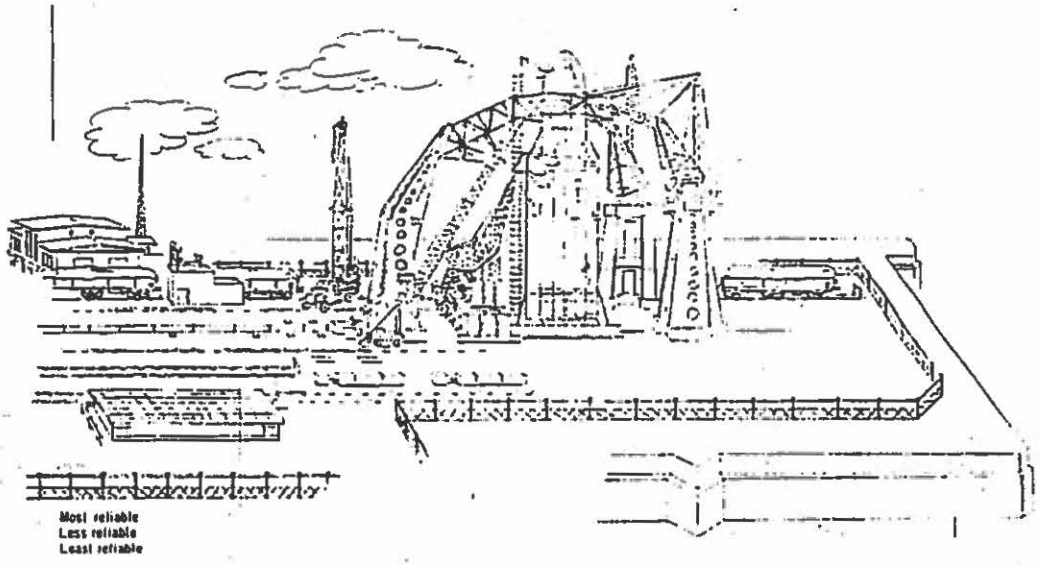

FIGURE 1. RECONSTRUCTION OF LAUNCH SITE.

[redacted]

The photography, because it is very selective and may have been retouched, reveals little of the actual operations at the rangehead and shows an incomplete picture of the ground support equipment. Several of the film sequences reportedly were made at the "Baykonur Cosmodrome," which apparently corresponds to the rangehead of the Tyuratam Missile Test Range. Although some of the sequences showing the service tower may have been filmed from a model, the evidence does not indicate a motion picture set or studio having been used exclusively to reconstruct Launch Complex A of the rangehead. If a model was used in filming some of the sequences that show the service tower, it is consistent with the tower

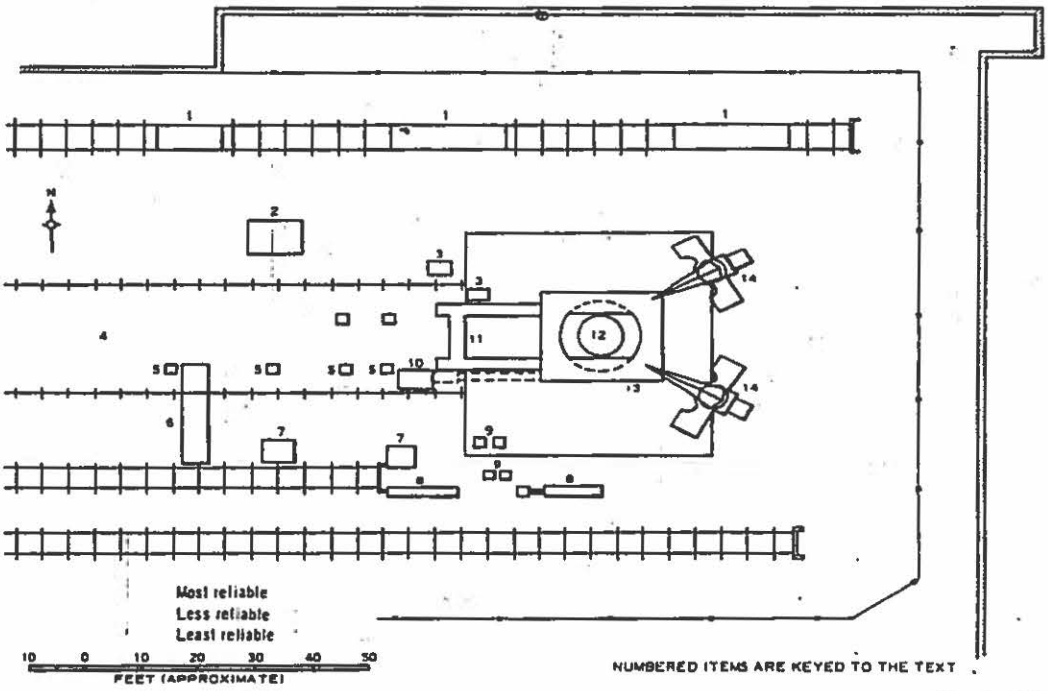

FIGURE 2. DIAGRAM OF RECONSTRUCTED LAUNCH SITE.

shown in those portions of the film that depict other identifiable items, and with other open-source photography.

The sequences of the film showing the service tower and the elevator hoist also show several background features consistent with those identified at Launch Complex A on photography of [redacted] as follows (Figure 1): a drive-through (Hi-Hat) building northwest of the launch structure; a low rectangular structure previously identified as a cascade; railroad tracks leading onto the launch platform; and the road pattern around the launch platform. 1/ The following features of the launch structure are annotated on Figure 2:

25X1D

1. Approximate position of probable rail cars as photographed with a telephoto lens.
2. Structure of concrete or other masonry material. Holds battery of floodlights and has two narrow slits in one side. Possibly [redacted]

25X1B
25X1D

3. Two unidentified objects, possibly machinery or part of a truck cab or fender, observed on separate frames of photography.
4. Outer parallel lines represent standard-gauge rails or scars of a former rail [redacted]

25X1B
25X1D

5. Four shallow depressions in the concrete launch platform.
6. Large rectangular rough-surfaced area on the concrete launch platform. No significance can be attached to the area.
7. Two square scars in the concrete surface of the launch platform. [redacted]

25X1B
25X1D

8. Rectangular boxes possibly containing tools or firefighting equipment. Several [redacted]

25X1B

9. Four scars similar to those in item 7. [redacted]
10. Square area, with its extensions, represents positions of the elevator stairway, car, and track.
11. H-shaped figure represents the service tower.

25X1D

12. Smaller circle represents the capsule in position on the launch platform. Diameter of [redacted] feet corresponds to measurements of the Vostok capsule as shown in Soviet photographs. Broken circle, 15 feet

FIGURE 3. ASTRONAUT APPROACHING PLATFORM.

in diameter, represents the booster position superimposed on the launch platform.

13. Approximate size and position of the service platform, adapted from a photograph of the platform supposedly used in launching the "Laika" dog orbital vehicle. A photograph of the tower with a heavier superstructure suggests a different platform of a hexagonal or polygonal shape may have been used for the manned orbital flights.

25X1D [redacted]

The immediate area of the launch pad appears to be a single concrete mass, whereas adjacent areas of the launch platform appear to be paved with concrete slabs approximately

25X1D [redacted]

25X1B

The facility previously identified as a cascade appears to have a gabled roof in the movie film sequences. Approximately 40 alternate light and dark lines running the width of the structure probably suggested pressure tanks in the earlier analysis. 1/ The walls of this structure are low and appear to be of concrete construction, with extra reinforcing at the midpoint and corners. Two petcocks are visible on one side, and a pipe parallels this side of the structure for its entire length (Figure 3). This structure and the plumbing in the vicinity suggest a covered rectangular water tank more than a high-pressure storage facility.

The framework of the service tower shown in the ascent of the astronaut to the capsule supports an insulated possible LOX tapping or coolant line and several cables (Figures 3, 4, and 5). The framework appears to be of two different types of beams: the support base of heavy members, and the superstructure of lighter members. The latter appear to join the service platform, or to terminate in the area of the platform. The computed height of the plat-

FIGURE 4. ASTRONAUT BEGINS ASCENT.

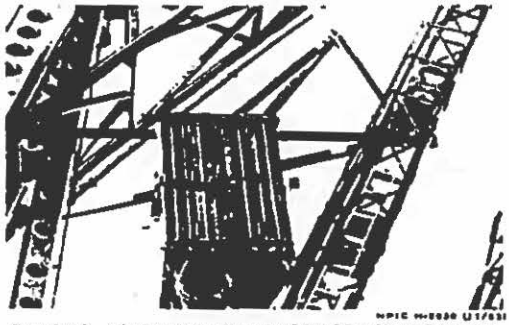

FIGURE 5. PORTION OF FRAMEWORK OF SERVICE TOWER.

form used in the manned flight, based on photography, is approximately 85 to 90 feet.

The entire service tower, which may be a replacement for an earlier structure, probably is strong enough to support more than the weight of the elevator or lifting device. The platform lifting device shown in the launch of the dog "Laika" (Figures 6 and 7) may operate on the same track as the elevator device used for the manned flights (Figure 8). The track portion of the service tower, which is of simple box-beam construction, may be removable; the method of attaching this portion to the service

FIGURE 6. PLATFORM LIFTING DEVICE.

platform or the main service tower cannot be determined from the available photography.

It is not possible to determine if the service tower is attached to the launch platform, as the base of the tower is not visible on the photography. Even if the tower is attached to the platform it is probably movable, as a launch failure or accident would endanger the equipment. There is photographic evidence to suggest that a portion of the service tower may have been positioned to the rear of the launch point and the main mass of the tower during the filming of the movie sequences. None of the

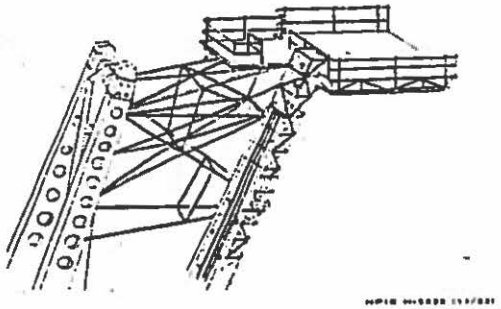

FIGURE 7. CONCEPT OF PLATFORM LIFTING DEVICE.

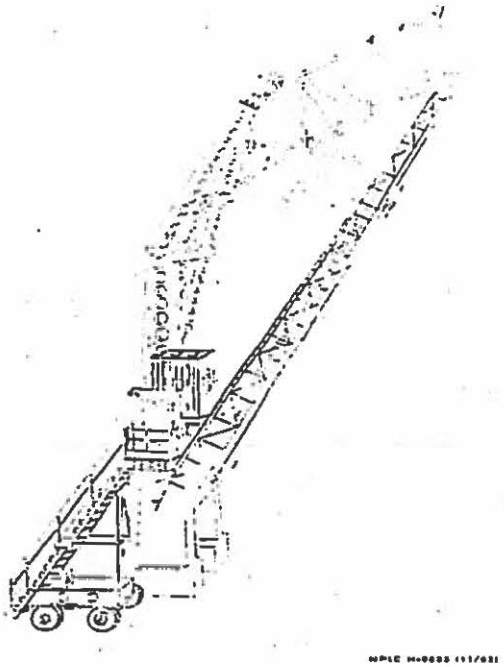

FIGURE 8. CONCEPT OF SERVICE TOWER AND ELEVATOR.

materials analyzed show the entire service tower, launch platform, or [redacted]-foot circular opening on the launch pad. 1/ By moving a portion of the tower on the special [redacted] foot-wide tracks, and assuming sufficient clearance beneath supporting elements, it would be possible to have a rail car carrying the booster to pass through the moved portion and into position for erection of the booster. However, the possibility also exists that the booster could be transported to the launch position on a wheeled vehicle.

Some of the movie sequences show possible LOX rail cars, apparently on the same rail line as that seen on previous photography (Figure 1). This portion of the film apparently was taken with a telephoto lens but still provides a strong indication of the continued existence of this rail line.

Near the western edge of the launch platform is a concrete structure, with narrow slits in the side, which holds a battery of floodlights (Figure 9). This structure might be used for protection during defueling operations and possibly is used for night operations. A tower appears to be adjacent to the drive-through Hi-Hat building previously identified. 1/

FIGURE 9. ASTRONAUT WITH CONCRETE STRUCTURE IN BACKGROUND.

It was necessary to speculate as to the minimum requirements for launch support because only limited ground hardware was observed at the launch site on the available photography. Two additional service towers were assumed in order to provide supporting members for the service platform at the level of the capsule. A portion of one of these towers can be seen from photography in USSR, and is illustrated in Figure 10. These two towers, together with the service tower to the rear, would provide a tripod to support the service platform (Figure 11). It was further

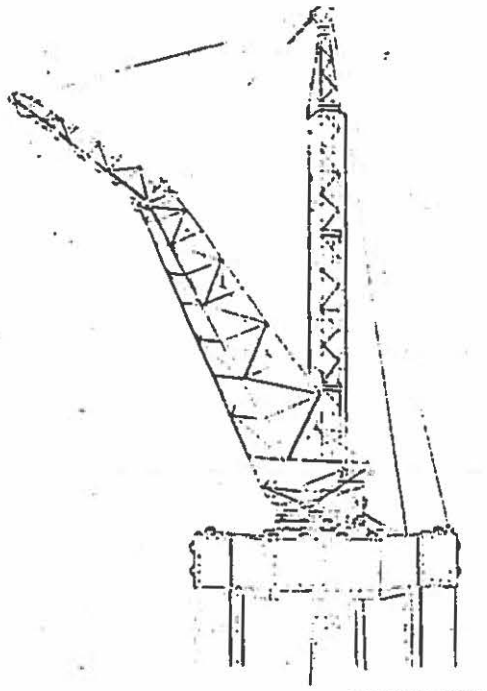

FIGURE 10. CONCEPT OF ASSUMED ADDITIONAL TOWER.

assumed that these two supporting towers could be pivoted in order to remove the service platform in two sections.

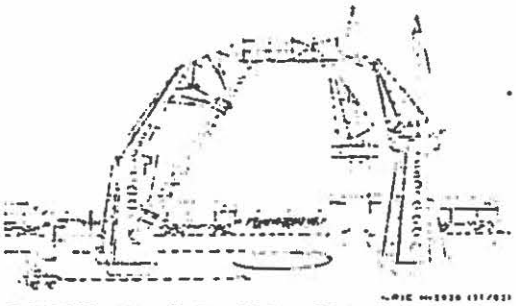

FIGURE 11. ASSUMED TRIPOD FORMED BY THREE TOWERS.

It was assumed also that this tripod arrangement served as a lifting device for raising the booster and capsule into position. It cannot be determined whether the booster is erected and the capsule placed on top, or the capsule lifted and held aloft while the booster is erected below it. It is assumed, however, that the mating of the booster and capsule takes place on the launch pad.

The booster-capsule connection would take place approximately 70 to 75 feet above the launch pad in this hypothetical reconstruction of the launching structure and service towers. This approximate elevation is based on many variable factors and also assumes the booster does not extend below the level of the launch pad.

REFERENCES

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CIA. OCR GR R-6030, Again to the Stars (CONFIDENTIAL)

DOCUMENTS

1. NPIC. R-1440/63. Tyura Tam Missile Test Center, USSR, Sep 63 (SECRET/No Foreign Dissem [redacted]

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REQUIREMENT

CIA. OSI R-150/61

NPIC PROJECT

JN-314/61