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basic imagery interpretation report

SS-X-24 Medium-Solid ICBM, USSR (S)

STRATEGIC WEAPONS INDUSTRIAL FACILITIES
BE: VARIOUS
USSR

Top Secret

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INSTALLATION OR ACTIVITY NAME					COUNTRY
The SS-X-24 Medium-Sized Solid Propellant ICBM (S)					UR
UTM COORDINATES	GEOGRAPHIC COORDINATES	CATEGORY	BE NO.	COMIREX NO.	NIETB NO.
	See below	See below	See below	See below	See below

MAP REFERENCE

ACIC, USATC, Series 200, Sheets, 0102-9,10, 0154-23, 0167-7, 0234-22,24 scale 1:200,000

LATEST IMAGERY USED	NEGATION DATE (If required)
	NA

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Installation Name	Geographic Coordinates	Category	BE No	COMIREX No	NIETB (MRN)
Krasnoarmeysk Solid Motor Development Facility	56-07-50N 038-09-54E				
Pavlograd Solid Motor Production Plant	48-34-02N 035-49-15E				
Pavlograd Ordnance Research and Development Facility	48-29-28N 035-57-12E				
Pavlograd Solid Motor Assembly & Test Support Facility	48-27-02N 035-57-25E				
Pavlograd Solid Motor Test Facility	48-26-00N 035-58-23E				
Plesetsk Missile/Space Test Center SSM	62-57-47N 040-22-43E				
Plesetsk Missile Handling Facility	62-46-19N 040-22-43E				
Plesetsk Eastern Support Facility	62-56-40N 041-26-13E				
Plesetsk Launch Test Site 14	62-58-16N 041-33-39E				
Plesetsk Launch Test Site 22	63-53-22N 041-45-37E				
Plesetsk Launch Test Site 28	62-52-45N 041-45-00E				
Safonovo Plastics Plant	55-05-11N 033-14-55E				

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ABSTRACT

1. Based on the status of production-related facilities, series production of a new medium-solid ICBM, designated the SS-X-24, could begin in mid-to-late 1984. The current SS-X-24 flight test phase—to date less than successful—may have a great effect on determining when series production will begin. This report discusses the SS-X-24 from prototype motor development, motor testing, plant and test center expansion, and flight testing, through projected deployment mode(s). (S/WN)

2. This report, which updates NPIC Report contains two location maps, 14 annotated photographs, and a chart of program milestones. The information cutoff date is (S/WN)

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INTRODUCTION

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5. The SS-X-24 is being flight tested at Plesetsk Missile/Space Test Center SSM. The logistical support facilities at the test center include the Missile Handling Facility and the Eastern Support Facility. Three launch sites for the silo-launch phase of flight testing are at Plesetsk: Launch Test Site (LTS) 28, LTS 22, and LTS 14. A rail-served probable ICBM launch test facility, under construction next to LTS 28, and other rail-associated construction at Plesetsk indicate that flight testing of a rail-mobile variant of the SS-X-24 will probably take place. The SS-X-24 will probably be used to replace the silo-based SS-17 ICBM and possibly some SS-11 ICBMs. Silo deployment is not expected to take place until at least 1985. Rail-mobile deployment would come even later. (S/WN)

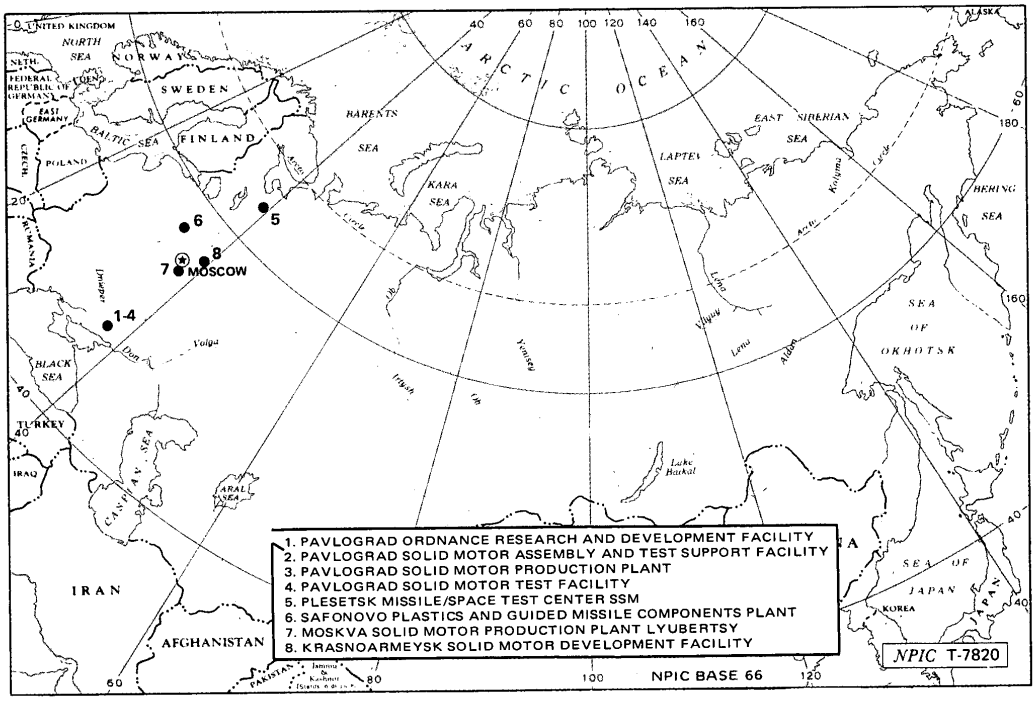

FIGURE 1. LOCATION OF FACILITIES ASSOCIATED WITH THE SS-X-24 PROGRAM

BASIC DESCRIPTION

Prototype Motor Development

In 1968, construction began on a new composite propellant line at Lyubertsy to support the development of a new motor(s). The line was probably operational by the end of 1971. Since the SS-16 was in development before this date, this construction timing indicates that the new line was for the 15ZH43. During the first half of 1972, several large motor cases or shipping containers, probably prototype fiberglass motor cases for the 15ZH43, were observed next to the largest test position at Lyubertsy.

Motor Case Development

7. A filament-wound, fiberglass motor case was under development at the Safonovo Plastic Plant in the early 1970s with the assistance of the Lyubertsy plant.[3] The size of the case, 9 meters long by 2 meters in diameter, is compatible with the cases/shipping containers seen at Lyubertsy during 1972. Between 1964 and 1972, at Safonovo, major construction, most likely related to an increased fiberglass winding capability, took place. First-stage shipping crates were identified at Safonovo during 1974 and 1975.

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Static Testing

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15ZH43

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Between 25X1
an motor, probably an early heavy-weight version of later prototypes, was brought to the test position where it was positioned on cradles in front of the thrust block. On 25X1
a spent and discarded motor 25X1
was in the boneyard near the test position. The first probable flight-weight, first-stage motor, 9 by 2 meters, was at the static test position on 25X1
Expansion of the test position, begun 25X1
during July 1975, was completed before October. A period of relatively intense testing probably then took place in October with two 9- by 2-meter motors observed at the test position. 25X1

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revealed pretest activity involving a 25X1
15ZH43 motor. The failure of this prototype motor on marked the probable 25X1
end of the program for the 15ZH43. 25X1
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10. Testing at Pavlograd for the second- and third-stage motors possibly occurred concurrently with development of the first-stage motor during 1975. In January 1975, a long motor was 25X1
seen at the test position, and in May, two 25X1
meter-long motors, probably expended, were in the boneyard. Several motors of lengths and diameters suitable for a third-stage medium solid motor have been seen at Pavlograd. Identification of these motors for the medium-solid ICBM is complicated by the similiarity with certain stages of the SS-16 ICBM, the SS-20 IRBM, and the SS-NX-17 and SS-NX-20 SLBMs. (TSR)

15ZH44

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late 1976 and April 1977, a 9- by 2-meter-long motor was again observed at the test position. 25X1

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[4] This combination 25X1
of events strongly suggests that all testing after October 1975 was for the 15ZH44/SS-X-24. 25X1

12. During June and July 1978, all the expended 9-meter-long and motors 25X1
were removed from the test area, an indication that the static test phase was complete. In August

1978, possible evidence for acceptance testing of the 9-meter-long motor was observed at Krasnoarmeysk Solid Motor Production Facility, where a canvas-covered, possible motor case was seen on a railcar behind the large horizontal test position in the assembly checkout and test area. Frequent imagery obtained during August revealed a high volume of static testing at the large test position. (S/WN)

Flight Test Missile Production

Motor Production

14. Production of solid motors for all three stages of the SS-X-24 is done at Pavlograd SMPP. Some of the stages were probably cast in the completed portion of the new solid motor production line, with the support of the original portions of the plant (Figure 2). This new line, started between September 1977 and August 1978, is not yet complete. The propellant mixing and motor casting portions of the line, however, were completed and separately secured by late 1981. The curing and motor finishing could have been done in original portions of the plant. This combined production capability appears to be sufficient for the limited production of motors for flight testing. (S/WN)

Motor Case and Transport/Launch Canister Production

16. Five buildings, designated 92, 98, 99, 96, and 97, at Safonovo (Figure 3) were previously associated with the 15ZH43.[3] After the probable end of the 15ZH43 program in October 1975, four of these buildings, then under construction, were completed, an indication that these buildings can be associated with the SS-X-24.[3] The first of these five buildings was observed under construction in December 1972. Construction on the four buildings was complete by 1981. The construction pace was considerably different for each building.

Bldg No	Date Started	Date Externally Complete
92	Dec 72	late 77
98 & 99	Jan 74	late 76
96	Jul 78	Feb 81
97	mid-76	construction stopped in late 81

A manufacturing/fabrication building, Building 92, the largest and first complete SS-X-24-associated building, did not appear to have even a limited production capability until 1980. 25X1 25X1 existed. Analysis of imagery indicates that since early 1981, almost two years before the first flight test, limited production had been taking place in Building 92. This production appears to be consistent with the operational capability of Building 96, the hydrostatic test building, which was not complete until early 1981. Based on the timing of this construction, the items produced in the SS-X-24-associated buildings at Safonovo were not involved in the production of motors for the static testing phase for the 15ZH43, and probably not for the SS-X-24. It can therefore be extrapolated that these items were for the flight testing phase of the SS-X-24. 25X1 25X1

17. While no transport/launch canister for the SS-X-24 has been observed on imagery or 25X1 Probable LADs have been observed near the silo after both test launches from Plesetsk LTS 22 (Figure 4) and one of the launches from LTS 28. 25X1

18. Motor cases for the SS-X-24 will possibly be produced at the Pavlograd ORDP (Figure 5). The time span of reports[3] linking two buildings in the Pavlograd area with Safonovo and the dates of the renovation/construction of two buildings at Pavlograd ORDP indicate that motor case production possibly occurred at this plant. 25X1 25X1 25X1

Final Assembly

19. Final assembly and checkout of the SS-X-24 for flight testing is probably being done at Pavlograd Solid Motor Assembly and Test Support Facility. Buildings associated with the SS-X-24 at the facility are annotated in Figure 6. (S/WN)

20. Construction was started on five buildings (Figure 6; items 1, 2, 3, 4, and 6), three assembly and two storage buildings, in late 1977 and early 1978. Four of these buildings were externally complete in mid-1980. Railcar activity observed at the facility since late 1981 indicates that some limited production/assembly has been taking place. Most likely, this production has been for the flight test missiles. (S/WN)

Ground Support Equipment

21. No production facilities have been identified for ground support equipment (GSE) associated with the SS-X-24. Through August 1983, the GSE identified in support of the SS-X-24 flight test

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phase at Plesetsk includes a missile transporter, a silo loader, an upper canister transporter-loader, a type IV warhead van, and several different pieces of silo/missile system checkout (S/MSC) vehicles. The missile transporter and silo loader are configured differently from any GSE associated with the other missile systems, and the upper canister transporter-loader is a typical MAZ chassis with a specially-designed erecting mechanism. The type IV warhead van is associated with other MIRV missile systems. Components of two missile transporters and two silo loaders were shipped to the test center for final assembly, making the origin of production difficult to identify. If the Soviets continue this practice, the identification of the plant(s) where this GSE is produced will continue to be a problem. (S/WN)

Flight Test Center Construction Activity

22. Preparations for the flight test phase of the SS-X-24 program began at Plesetsk (Figure 7) in 1978. Three LTS were either converted from existing silos or scratch-built to support the silo-launched phase. LTS 14 and LTS 22 each have one silo and LTS 28 has two. New support facilities to support this phase of the program were constructed at the Missile Handling Facility (MHF) and the Eastern Support Facility (ESF). Preparations for flight testing of a rail-mobile variant of the SS-X-24 began in mid-1981. A rail-served probable ICBM launch test facility next to LTS 28, a new probable missile receiving and checkout area at the MHF, a new missile-associated construction area, and the eastern extension of the main complex rail line all indicate that a rail mobile variant of the SS-X-24 will probably be tested. (S/WN)

SS-X-24 Launch Test Silos

23. LTS 28 is a scratch-built launch site (Figure 8). Construction on this dual-silo site began in early 1978. While the silos were essentially complete during 1980, final construction at the site wasn't complete until approximately mid-1982. The silos were constructed by using type IIIH (SS-17) silo components and a unique new headworks, which increases the silo depth by about 4 meters. The new headworks component was placed between the top of the third silo sleeve section and the bottom of the door pocket. A new, hexagonal plate/structure was atop of the silo door; it has not been observed on other type IIIH silo doors. A line drawing of the silo is presented in Figure 9. (S/WN)

24. Launch sites 22 and 14 were both converted from type IIIE (SS-13) silos to the LTS 28-type silo. LTS 22 was started in August 1978 and completed in mid-to-late 1982. LTS 14 was started at about the same time as LTS 22 and was externally complete in August 1983. LTS 14 should be capable of supporting the SS-X-24 flight testing before the end of 1983. (S/WN)

Rail-served Probable ICBM Launch Test Facility

25. Construction was started on a rail-served probable ICBM launch test facility next to LTS 28 (Figure 8) in late 1982. A buried launch control building, identical to the launch control building constructed between the two silos at LTS 28, was also started. Other features being added to this facility, similar to those at LTS 28, include a support building and at least five instrumentation buildings. In addition, a 102-meter-long rail-in shed was constructed just northwest of the buried launch control building. (S/WN)

Support Facilities

26. New construction has been initiated in both the MHF and the ESF and is probably associated with both the silo-based and rail-mobile variant phases of flight testing. The following three areas were added to the MHF (Figure 10): the SS-X-24 missile receiving and checkout area (MRACA), the silo materials receiving area (SMRA), and a new probable MRACA. (S/WN)

27. Construction of the SS-X-24 MRACA began in 1978 and was complete in about September 1982. Rail-to-road probable missile transloading operations have been periodically observed during 1983 (Figure 11). In addition to the standard Soviet SRF 24-meter-long missile railcars associated with the SS-X-24, two unique 19-meter-long SS-X-24-associated railcars have been identified. These unique railcars are probably used for shipment of SS-X-24 components to Plesetsk. (TSR)

28. A SMRA (Figure 12) was constructed next to the SS-13 receiving, inspection, and checkout area in the MHF in 1979. Silo components, used in the construction of the LTS 28-type silos, were delivered there. Although construction is essentially complete on the silos, silo components have remained in the SMRA since [redacted] The remaining components included two type IIIH (Phase IV) silo doors and door pockets, five type IIIH silo liner sections, and one set of type IIIX (launch control silo) upper silo components. (S/WN) 25X1

29. A new probable MRACA (Figure 13) is presently under construction at the MHF probably to support a rail-mobile variant of the SS-X-24. All the main buildings at the new possible MRACA are rail served. A rail-through probable missile receiving and checkout building was also under construction. The high-bay portion of the building is served by three rail lines and an additional fourth rail line is alongside the low-bay side. These four rail lines extend to the north and join into one rail line which serves only the high-bay portion of a 104-meter-long high-bay building. This building will probably be associated with the calibration and checkout of the rail-mobile ICBM. A four-bay, rail-served probable interim missile storage building was also being constructed in the new probable MRACA. (S/WN)

30. Additional construction has been started at the ESF (Figure 14), the vehicle maintenance and storage area for equipment used at the eastern end of the range. A 50-meter-long, five-bay garage was constructed in mid-1980. This garage is used for SS-X-24 GSE (Figure 15). A possible post boost vehicle (PBV) propellant transfer area was constructed in the southwest corner of the facility (Figure 14). This area was completed in February 1983 and will perhaps be used in support of the SS-

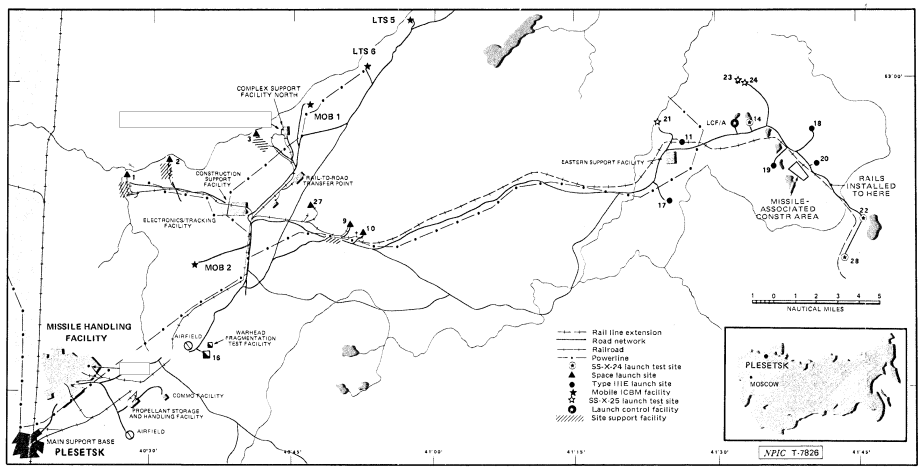

FIGURE 7. FACILITIES ASSOCIATED WITH SS-X-24 FLIGHT TESTING, PLESETSK

X-24 program. The PBV for the SS-X-24 probably uses liquid propellants. (S/WN)

31. Construction began on a rail-to-road transfer point (RTP) between the ESF rail siding and the Plesetsk main complex east/west road in February 1983 (Figure 14). (S/WN)

32. A new missile-associated construction area was identified in mid-1983, approximately 3 nm southwest of Plesetsk Launch Test Site 20 (BE and next to the right-of-way for the eastern extension of the main complex rail line. The new construction area consists of two locations—a probable launch control silo and a rail-siding area, with a 102-meter-long rail-in shed (Figure 16), identical to the rail-in shed at the rail-served probable ICBM launch test facility. (S/WN)

33. The new probable MRACA, the new RTP, and the new rail-served probable ICBM launch test facility are connected by the eastern extension of the main complex rail line at Plesetsk. This rail line extension extends at least to LTS 28 (Figure 7). Based on the construction pace for all this activity, the earliest that all the rail-associated construction could be finished would be during 1984. (S/WN)

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Flight Testing

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SS-X-24 Flight Tests:

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Items 1-4 are classified SECRET; item 5 is classified

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[redacted]

Series Production

35. Series production of the SS-X-24 will probably be mainly carried out in the Pavlograd area. Some of the facilities associated with the series production of the SS-X-24 have been or soon will be completed. The stages for the missiles used in the current flight testing phase were built at Pavlograd, an indication that the production line there has at least a limited capability. While the facilities for series production of the SS-X-24 will probably be completed as early as mid-1984, a start up in series production of the SS-X-24 before successful completion of the flight test program would be unexpected. (S/WN)

36. The timing of the start of construction and the estimated completion date of the new SMPP at Pavlograd (Figure 2) indicate that the production line will probably be involved in SS-X-24 series motor production. Construction on the rest of the line continued through August 1983. The curing building was externally completed in July 1983, and the X-ray test building was in the mid- to late-stages of construction. Footings were emplaced for another curing building in September 1982; construction has not progressed past this point and it appears that its construction has been postponed. If the second curing building is not included, the earliest that the production line could be completed and ready for series production would be mid-to late 1984. (S/WN)

37. In possible related activity at Pavlograd ORDP, the start dates and pace of construction for buildings within this plant may indicate that the plant is also associated with series production of components for the SS-X-24. (S/WN)

Final Assembly

38. Final assembly of the SS-X-24 will be done at the Solid Motor Assembly and Test Support Facility in Pavlograd (Figure 6). Completed portions of this facility have been involved in the assembly of the flight test missiles. Construction has continued through August 1983. A fourth assembly building (Figure 6; item 7) was started in mid-1980. Also during this period, an administration/engineering annex (Figure 6; item 10) was added and a checkout building (Figure 6; item 5), connected by covered walkway to the administration/engineering annex, was constructed. (S/WN)

39. In early 1983, construction began on a possible checkout building (Figure 6; item 9). Grading for the foundation of a new building (Figure 6; item 8) was started in spring 1983, and in late July 1983, grading for a probable new building (Figure 6; item 11) began in the northwest corner of the facility. These two new buildings are probably not part of the SS-X-24 series production line. In spring 1983, a new security fence encompassing a 300- by 180-meters area was added to the northwest corner of the facility. This fence may indicate either that an additional building will be built or that the rail line will be extended to allow easier rail access. (S/WN) 25X1

40. The assembly building, started in mid-1980, is externally complete but not operational. In addition, another small checkout building was in the midstage of construction. These buildings will most likely be finished in early to mid-1984, completing the SS-X-24 final assembly line for series production. (S/WN)

Deployment Mode(s)

41. The SS-X-24 will probably replace at least the 150 deployed liquid-fueled SS-17s. Two facts support this. One, there has been no conclusive evidence of improvement or modification programs for the SS-17. Two, silo components used in the LTS 28-type silos at Plesetsk are basically similar to those of a type IIIH silo, which the SS-17 system uses. (S/WN)

42. The production capacity of the SS-X-24 series production facilities appears to be more than would be needed if the SS-X-24 were meant only to replace the deployed SS-17s. The next most likely candidate for replacement by the SS-X-24 would be the SS-11. This liquid-fueled missile is deployed in type IIID silos; all the deployed type IIIH silos have been converted from non-modernized type IIID silos. Therefore, the Soviets could also replace some older SS-11s with the new SS-X-24. The new missile may also be deployed in a rail-mobile mode. (S/WN)

43. Silo deployment of the SS-X-24 is not expected until at least 1985. Activity has been observed at Kostroma, one of the two SS-17 complexes. Preliminary construction near the RTP began between [redacted] Although it is too early to associate this construction with future deployment of the SS-X-24, the lead time needed to support a silo conversion program plus the time to complete the first launch group would indicate a 1985 deployment. No new construction activity has been identified to date at Yedrovo, the other SS-17 complex. Construction of a second component handling area, in the mid- to late-stages of construction at Kozelsk, an SS-11/-19 complex, is of unknown significance but might possibly be related to SS-X-24 deployment. (S/WN) 25X1

44. If a rail-mobile variant of the SS-X-24 is to be deployed, it is not likely that it will take place before silo based deployment. Preparations for SS-X-24 silo launch flight testing began well before preparations for rail-mobile launch light testing. Flight testing of a rail-mobile mode variant is not expected to begin before mid-1984 at the earliest. (S/WN)

Next 2 Page(s) In Document Denied

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REFERENCES

IMAGERY

All relevant imagery acquired through the information cutoff date, was used in the preparation of this report. (S/WN) 25X1

MAPS OR CHARTS

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6. CIA. SW SWDR 83-167K, CIA/OSWR 529665, *Science and Weapons Daily Review. (S)*, 12 Apr 83 (TOP SECRET 25X1 25X1

*Extracted information is 25X1

**Extracted information is SECRET

REQUIREMENTS

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