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Soviet Missile Development and Production Facilities Associated With SS-X-25 (S)

STRATEGIC WEAPONS INDUSTRIAL FACILITIES BE: Various USSR



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Belgoroo Plant	l Plastics	50-35-15N 036-37-30E			,,,,	······	
Bryansk (Guided Missile Equipment	53-17-14N 034-23-51E					
Biysk Co	mplex	52-31-19N					
	rmaments	085-09-58E 56-19-38N					
Stalin 92		043-53-27E					
	-Shakhtinskiy otor Production	48-17-53N 040-10-49E					
Missile-	o Probable Associated nent Plant	56-15-46N 037-58-34E					
	meysk Solid Development	56-07-50N 038-09-54E					
Guided	otor Vehicle and Missile Support ent Plant	53-51-31N 027-39-29E					
Product Lyubert	•	55-36-48N 037-52-40E					
	d Solid Motor ion Plant	48-34-02N 035-49-15E					
Pavlograd Test Fac	d Solid Motor ility	48-26-00N 035-58-23E					
	id Motor ion Plant	57-59-17N 055-53-26E					
Petrokre	oost Explosive id Motor Plant	59-59-14N 030-59-40E					
Plesetsk I	Missile/Space nter SSM	62-57-47N 040-24-46E					
Safonovo Guided	Plastics and	55-05-11N 036-37-30E					
Volgogra	d Steel chinery Plant	48-46-34N 044-34-52E					
	Missilie sembly and ut Facility	57-02-17N 054-08-31E					
Votkinsk Machine Steel Pla	ery and	57-02-43N 053-59-03E					
		A	BSTRACT				
olid-propellant stra ikely a variant of a s being flight teste S/WN)	tegic missiles. T missile derived d, was begun i	Union is com he SS-X-25 is from the bas n 1970. Initia	imitted to the sa small, so sic SS-16. Inial deployment	olid-propella itial design w ent of the sy	nt (small solid) vork for this mis vstem is not exp	sile system, which pected until 1985.	
hrough the flight-tenants, 13 annotated	est phase and d	iscusses pote	ntial deplo	vment mode	s. This report of	ne design bureau ontains 2 location or this report is	

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FIGURE 1. LOCATIONS OF SS-X-25-ASSOCIATED DEVELOPMENT AND PRODUCTION FACILITIES, USSR

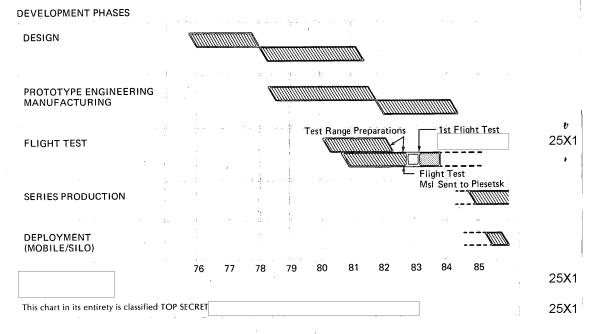


CHART 1. SS-X-25 DEVELOPMENTAL PROGRAM MILESTONES

INTRODUCTION

3. The program to develop a new, small solid ICBM, designated the SS-X-25, is in the flight-test phase at the Plesetsk Missile and Space Test Center SSM (Figure 1). Emphasis in discussing the development of this ICBM (Chart 1; Table 1) will be placed on activities at and expansion of facilities under the direction of the Nadiradze Design Bureau (KB), the design entity for this ICBM.¹ The facilities reviewed in this report are included because of their past associations with the SS-16 program of which the SS-X-25 is believed to be a derivative.

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Table 1. Facilities Associated with the Development of the SS-X-25²

Facility Facility	Acceleding the SS-A-23-
	Association
Moscow Institute of Thermal Technology	Location of Nadiradze Design Bureau (Designer of the SS-16 and SS-20)
Moskva Solid Motor Production Plant Lyubertsy	Propulsion R&D
Khotkovo Prob Msl Assoc Component Plant	Plastics/Fiberglass Missile Components R&D
Safonovo Plastics a Guided Missile Plant	Transport Launch Canister and Motor Case Production
Belgorod Plastics Plant	Motor Case Production
Gorkiy Armaments Plant Novoye Sormovo Stalin 92	End Domes and Interstage Components Prod
Biysk Complex	Filling of End Domes with Solid Propellant
Kamensk-Shakhtinskiy Solid Motor Prod Plant	Filling of Motor Cases with Solid Propellant
Petrokrepost Explosive and Solid Motor Plant Morozov	Filling of PBV Motor
Perm Solid Motor Production Plant	Filling of PBV Motor
Pavlograd Solid Motor Prod Plant	Filling of Prototype Motors and Static Testing
Pavlograd Solid Motor Test Facility	Static Testing
Krasnoarmeysk Solid Motor Development Facility	Motor Acceptance Testing
Minsk Motor Vehicle and Guided Msl Spt Equip Plant	TEL Chassis Production
Volgograd Steel and Machinery Plant Krasnyy Barri	Transport Launch Canister and TEL Chassis Fitout
Votkinsk Msl Machinery and Steel Plant 235	Missile Hardware Fabrication; Final Assembly Overseer; Nozzle, PBV, and Guidance Control Production
Votkinsk MsI Final Assem and Chkt Fac	Final Assembly of Missiles for Flight Test
Plesetsk Msl Space Test Center SSM	Flight Testing, system integration
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Table 3. Nadiradze-Designed Ballistic Missiles^{1,3,5}

System	Development	Flight Testing	IOC
15Zh42 (SS-16)	1964 – 1972	1972 — 1976	1976
15Zh45 (SS-20)	1970-1974	1974 — 1976	1977
15Zh48	1974 — 1982	_ '	· · ·
15Zh53 (SS-20 Mod)	1974-1979	1979 — 1980	1981
15Zh54	1976-1981	_	_
15Zh56	1979 — 1983	1983 —	-
15Zh57	1979 –	_	_
15Zh58 (SS-X-25)	1979-1983	1983 —	-

Based at Plesetsk

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BASIC DESCRIPTION

Program Design and Management Authority

items. These three plants were discussed in an RCA-09/0015/83. De-NPIC report, velopments at Soviet Probable Missile Related Plastics Plants (S). (S/WN)

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Static Testing

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Prototype Motor Development

Motor Production

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- Motor Case Development and **Production**

7. Three different plants (Khotkovo Probable Missile-Associated Component Plant, Belgorod Plastics Plant, and Safonovo Plastics and Guided Missile Component Plant) are involved with the development and production of plastic and fiberglass components that are probably used in the SS-X-25. The transport/launch canisters are produced at Safonovo and the rocket motor cases are produced at Belgorod. Additional plastic and fiberglass components are produced at Khotkovo. Khotkovo, Belgorod, and Safonovo have undergone extensive expansion since the probable inception of the SS-16 follow-on program, but the expansion at these plants could be in support of missile programs of missile design bureaus other than Nadiradze or of production of commercial

9. The three motor stages of the SS-X-25 are believed to be produced at Kamensk-Shakhtinskiy SMPP (Figure 2). Motors produced there would be both for the flight-test phase and eventually, for series production. The facility is a composite propellant production plant and has been responsible for the series production of the first-stage motor for the SS-16/-20. The first stage of the SS-16 and the SS-20 is believed to be similar. Since construction of SS-20 bases continues, additional SS-20 motor production is needed not only to support new deployment, but to replace missiles that have aged, have been mishandled, or have been used for troop training launches. (TSR)

10. New construction and building modifications since 1977 have significantly increased plant production capabilities. The major improvements include construction of a new production line, addition of 12 curing bays (2 of which are in the new production line), remodeling of and addition to a nondestruct test building, an addition to an existing case preparations building, and the construction of a possible new case preparations building. Construction and an increase in motorrelated equipment at the plant indicate that the facility is capable of producing the motors for the SS-X-25. The expansion of facilities at Kamensk-Shakhtinskiy SMPP following deployment of the SS-20 indicates that the expansion was in support of the SS-X-25. (S/WN)

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	meters in diameter) and probable dome enclosures! Make been seen in increasing numbers in the motor finishing area (Figure 2) since August 1980. These items together may serve as containers for first-stage motors for the \$5-X-25. (S/WN) 12. The rail-served, six-bay curing building (Figure 4 and item 3, Figure 2), under construction since 1981, may be operational by the end of 1983. Two revetted buildings (items 1 and 2, Figure 2) have been constructed behind the curing building revetment. Three buildings hat may support the \$5-X-25 program are under construction in the ammunition storage facility. Ground preparations for several buildings in a new fence-secured area adjoining the production plant were underway during 1983. The area is approximately half the size of the production plant and will probably support future programs. (S/WN) Final Assembly and Checkout Flight Test Missile	25X 25X 25X
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55-20

Deployment of a missile is concurrent by Deployment of a missile is concurrent with its series production. Deployment of the SS-20 began in late 1977, and the high levels of rail traffic at two buildings (items 13 and 14, Figure 5) completed in 1976 and 1977, respectively, identify them as the series production final assembly facilities. (S/WN)

SS-X-25

Some of the buildings previously used for 17. Some of the buildings previously used for the \$5-16 program have probably been converted to support the small solid ICBM program. No rail traffic was observed from early 1981 through late 1983 to three buildings (items 6, 8, and 10, Figure 5) previously associated with the \$5-16. A building (item 12) was completed in 1981, but rail activity (item 12) was completed in 1981, but rail activity was observed at it only once in that year. During late 1982, increased activity was observed at a building (item 12, Figure 5) when unidentified equipment was seen outside the building and additional railcar activity was observed. The timing of construction and increased rail activity at this building is consistent with the small solid ICBM program. (S/WN)

18. In January 1983, a railshed (72 by 14 mele. In January 1993, a railsned (72 by 14 meters) was constructed over the railspurs next to an assembly/checkout building (Figure 6 and item 18, Figure 5). The shed could conceal up to six missile railcars. In addition, in June 1983 roofing for concealment purposes was positioned adjacent to a storage garage (Figure 7 and item 17, Figure 5). (S/WN)

Ground Support Equipment Production

19. Two facilities that have been instrumental in the production of mobile missile ground sup-port equipment (GSE) are in Minsk and Volgograd. Minsk Motor Vehicle and Guided Missile Support Minsk Motor Vehicle and Guided Missile Support Equipment Plant produces chassis that are fitted out at Volgograd Steel and Machinery Plant Kras-nyy Barri for mobile missile transporte-erector-launchers (TELs) and support vehicles. Missile transport launch canisters that are shipped in from Safonovo are also fitted out at Volgograd. (S/WN)

20. Minsk is the producer of the basic AV. MINISK IS the producer of the basic meter-long, six-axle chassis used for the SS-16 and SS-20 TEL. The observation of a longer chassis at the plant (Figure 8) on imagery of indicated that a new TEL may be under development. A longer chassis may be needed for a probable mobile version of the SS-X-25. (TSR)

21. The new chassis is TEL (e.g., a heavy-duty crane, a large pipe carrier, etc.). Until the longer chassis is observed fitted out as a TEL, its function cannot be confirmed. (TSR)

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as a TEL, its function cannot be confirmed. (TSR)

22. Mobile vehicular equipment and transport launch canisters for the S5-X-25 will probably be fitted out at Volgograd. MAZ six-axle chassis for meter missile support vans (MSVs) are fitted out at Volgograd. Vehicles for tactical missile systems and commercial vehicles are also fitted out there. Although a MAZ six-axle chassis was at Volgograd. A possible new-type MSV that may support upcoming mobile missile programs (Figure 9) has been identified at Volgograd. No transport launch canisters for the S5-X-25 have been identified at the facility (S/WN). been identified at the facility. (S/WN)

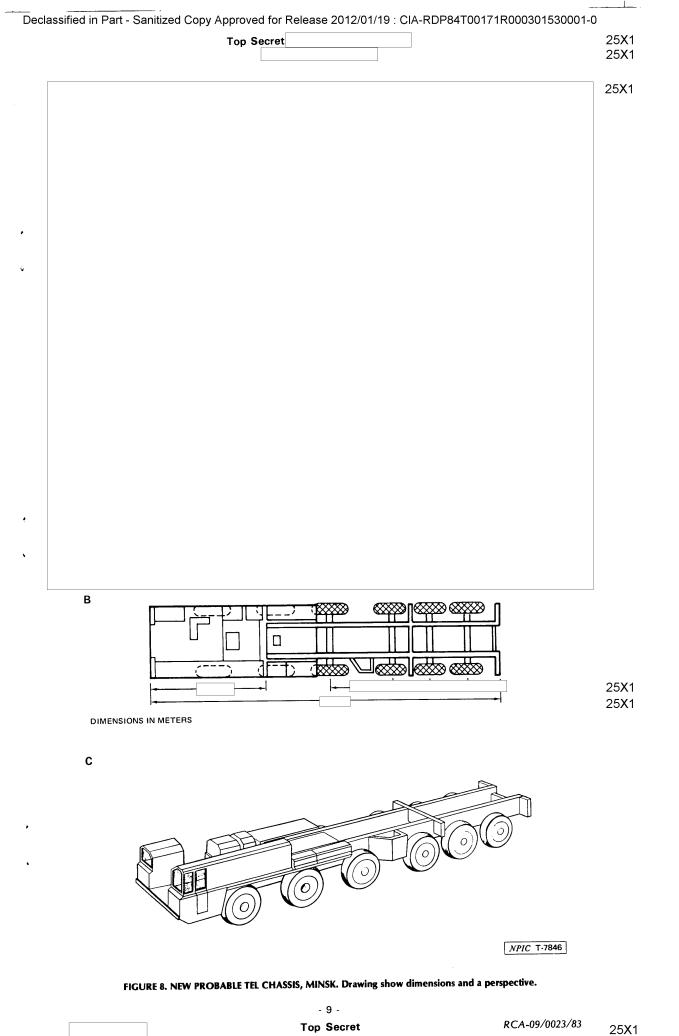
Flight Test Center Construction

23. Preparations for flight testing the SS-X-25 began in September 1980 at Plesetsk (Figure 10). Two type IIIE (SS-13) sites were modified to support the silo-based and probably the mobile launcher flight testing. Modifications at a dual-pad soft site may be related to testing of a mobile variant of the missile. New features were also added to two of the SS-16 receiving, inspection, and checkout (RIC) facility is being accomplished to support flight testing. Modified OSE for the silo-based flight testing has been delivered to the test center. (S/WN)

Launch Site Modifications

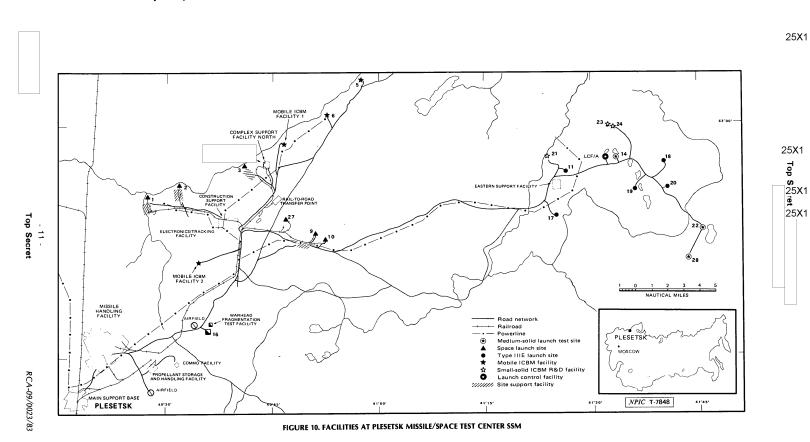
24. Silo-Based Phase. The type IIIE (SS-13) silos at Plesetsk ICBM Launch Test Site (LTS) 23 (BE and collocated Plesetsk ICBM LTS 24 and collocated Plesetsk ICBM LTS 24 [Figure 11] were modified to accommodate the SS-X-25 between March and October 1981. The SS-13 launch tubes and launch stand were removed from both silos, leaving the external appearance of the silo abors unchanged. The size of the silo apron was increased and canister/capsule (can/cap) transporter and silolader hard points/file down positions were installed in the aprons of both sites. New control and support facilities were also constructed. A buried launch control building was constructed next to each silo and a buried launch support building was constructed next to each silo and a buried launch to each silo and a buried launch support building was constructed next to each silo and a buried launch to each silo and a buried launch support building was constructed met was rected near each buried launch control building. (S/WN) (Continued p. 12)

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25. Mobile-Variant Phase. Between March and June 1982, a type C single-bay garage (SBG, Figure 12) was constructed at LTS 23 (Figure 11). This SBG is 2 meters longer than types A and B SBGs constructed at SS-20 facilities. Although a TEL for the SS-X-25 has not been identified at Plesetsk, the presence of this SBG strongly suggests association with a mobile-variant. Activity from late 1980 through mid-1982 suggested that the SS-X-25 may also be flight tested from Plesetsk ICBM LTS 21 (BE a dual-pad soft launch site. LTS 21 supported flight tests of the SS-X-15 and SS-16. In 1972, a 48-meter-long framework structure was built on the east pad and extension to conceal SS-16 flight test activities. During the SS-16 flight test phase, 24 meters of the structure were normally covered by eight 3-meter-long roof sections and the remainder of the structure was canvas covered. However, the lack of activity at LTS 21 since mid-1982, coupled with the construction of an SBG at LTS 23, suggests that LTS 21 may not be used for the SS-X-25 flight test phase. (TSR)

26. A set of hardpoints was installed at each of the two launch reference positions (LRPs) on the concrete road outside the TEL-garrison area at Plesetsk Mobile ICBM Facility 2 (Mob 2:

Plesetsk Mobile ICBM Facility 2 (Mob 2; during May 1982. Hardpoints are concrete slabs that provide a stable base for the leveling jacks of a TEL. The distance between the new hardpoints and the distance from the front hardpoints to the LRP are greater than the corresponding distances for the SS-16 at Plesetsk. The distance between the hardpoints for the SS-16 is and the distance from the front set of hardpoints to the LRP is the erect SS-16 missile canister would probably be positioned behind the rear TEL leveling jacks. An erect SS-16 missile canister would be approximately ters behind the LRP. The hardpoints outside Mob 2 are approximately apart, and the distance from the front set of hardpoints to the LRP is approximately If the height of the TEL used for the mobile version of the SS-X-25 is the same as that of the SS-16, then the distance from the LRP to an erect SS-X-25 missile canister would be approximately greater than for the SS-16 (Figure 13). This suggests that the SS-X-25 may be longer than the SS-16. Additional support for this judgement was provided by the identification of two circular marks near two of the 12 LRPs at Plesetsk ICBM LTS 5 in July 1982. A light-toned circular mark, in diameter, was applied to the concrete road approximately behind two LRPs in the TEL-garrison area of LTS 5. The marks may represent the position for an erect missile canister. Based on the identification of this probably SS-X-25-related activity in 1982, NPIC believes that the four SS-16 bases at Plesetsk will eventually support mobile SS-X-25 operations.

Support Facility Construction

(TSR)

27. Construction/modification activity in the SS-16 RIC area to support the SS-X-25 missile flight test phase began in 1980. The activity included modification of the RIC, telemetry/support, and interim missile storage buildings (Figure 14). Addi-

tions to the RIC area include a 48-meter-long clerestory building, a probable reinforced parking apron, a two-bay shed, a new component calibration building (in the late stages of construction as of August 1983), a four-bay garage, and two unidentified buildings in early-to-mid stages of construction as of August 1983. (S/WN)

Ground Support Equipment

28. During June and July 1981, a can/cap transporter and silo loader were delivered to Plesetsk. The vehicles have been used for silo/GSE compatability tests and for support of SS-X-25 silobased test launches. A TEL for a mobile version of the SS-X-25 has yet to be identified. However, a new six-axle chassis that could possibly be fitted out at Volgograd as a TEL has been seen at the production plant at Minsk. There have been indications at Plesetsk that the SS-X-25 may require a longer TEL; a longer SBG was built at LTS 23 and different hardpoint spacings were observed at Mob 2 in 1982. (S/WN)

Flight Test Phase

29. The missile has been successfully flight and 5 and tested three times (on from the silo at LTS 23, one of two collocated modified type IIIE silos. An example of postlaunch activity from the launch was seen on imagery of (Figure 15). A fourth launch failed in flight on whether it was launched from the silo at LTS 23 or from a TEL remains in question. Prelaunch activity near the SBG at LTS 23 was evidenced by canvas-covered equipment on the apron extension. The silo door was open and the silo appeared empty. Mobile flight test launches could originate from a TEL inside the SBG, from the apron extension next to the SBG, or from the silo apron. The SBG is about 35 meters from the silo at LTS 23.

Deployment Mode(s)

30. If the SS-X-25 is accepted for series production, the new ICBM could be deployed in one or more modes. First, the SS-X-25 may replace at least the 60 solid-propellant SS-13 ICBMs deployed at the Yoshkar-Ola SSM Complex

This deployment mode is supported by the fact that two type IIIE (SS-13) silos at Plesetsk were modified to support SS-X-25 flight testing. It is common practice for the Soviets to silo test launch new missile systems in the same type of launcher planned for the actual missile deployment. Additionally, the Soviets have stated that the SS-X-25 is a permitted modernization of the SS-13.¹³ (S/WN)

31. Another SS-X-25 deployment possibility would be as a replacement missile for some of the aging liquid propellant SS-11 ICBM force. Currently, the Soviets have 520 SS-11 launchers. Although some of these may be converted to the SS-X-24, more would probably be used for the SS-X-25. If the Soviets intend to use the SS-X-25 to replace some of SS-11s, they would be expected to modify/convert at least one of the research and

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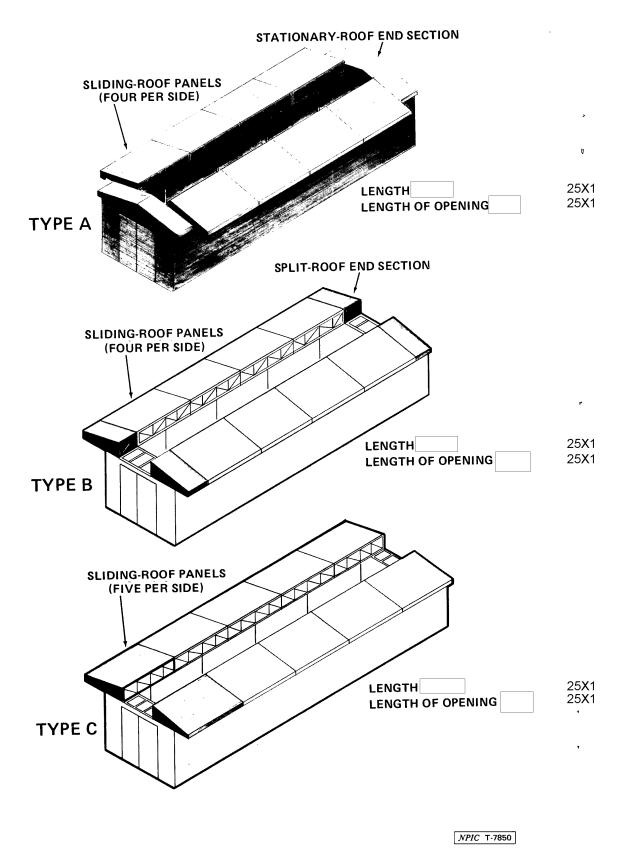


FIGURE 12. PLESETSK ICBM LAUNCH TEST SITES (LTSs) 23 AND 24

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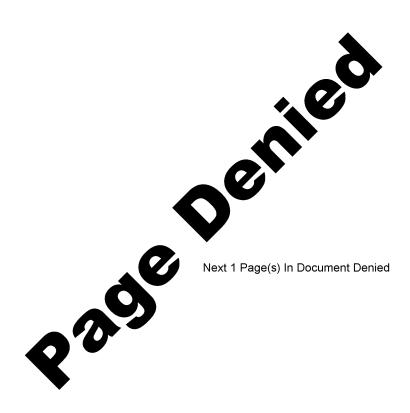
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	FIGURE 13. POSSIBLE SIGNATURE DIF	FERENCE BETWEEN SS-16 AND SS-X-25	
	development type IIID (SS-11) silos at Tyuratam Missile/Space Test Center In either case, silo deployment is not expected until at least 1985. (S/WN) 32. In addition to being silo based, the SS-X-	on the construction of the SS-20-style SBG at LTS 23 and the identification of a possible new TEL chassis and vehicle hardpoints believed to be associated with the SS-X-25. The Soviets, if this mode were employed, would then have an option of dismantling SS-11 silos in compensation for	25 X 1

25 may be deployed in a road-mobile mode similar to that of the SS-16/-20. This judgement is based

newly constructed mobile ICBM bases. (TSR)

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