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Imagery analysis report

Current Programs to Upgrade The Deployed SS-18 Missile System (S)

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CURRENT PROGRAMS TO UPGRADE THE DEPLOYED SS-18 MISSILE SYSTEM (S)

1. (TSR) Two programs to upgrade the SS-18 missile system are underway at the six deployed SS-18 complexes (Figure 1). One program modifies the 19 oldest SS-18 launch groups to accept the SS-18 MOD-4 (and probably any SS-18 payload deployed in the near future) and increase silo hardness. This program is currently underway in launch groups A at Dombarovskiy, Kartaly, and Uzhur SSM complexes, three of the 19 SS-18 launch groups completed before June 1978. Upgrading of the launch control facility (LCF) is an integral part of launch group modification. Launch group modification should be completed within eight to 12 months of silo unloading. The silo modification program could be completed by late 1983. The second program retrofits the SS-18 MOD-4 payload to the missiles at nine launch groups which were completed and loaded during 1978 before the SS-18 MOD-4 was deployed. These nine launch groups utilized the same structurally modified silo components[1] as the 20 SS-18 launch groups where the SS-18 MOD-4 was deployed in 1979 and 1980. These groups will undergo three-year major periodic maintenance (PM)[2] in 1981. Retrofit of the SS-18 MOD-4 payload has been incorporated into this PM cycle (retrofit/PM) and will take at least three months per launch group. The SS-18 payload retrofit program could be completed in 1981.

SS-18 LAUNCH GROUP MODIFICATION

Launch Site Modifications

2. (TSR) The launch group modification program had begun by August 1980 with the construction of temporary support areas (TSAs; Figure 2) outside the launch sites and LCFs of launch groups A at Dombarovskiy, Kartaly, and Uzhur SSM Complexes. No TSAs have been constructed at Dombarovskiy ICBM Launch Sites 4A ( ) and 6A ( ) The TSAs consist of at least one large, single-story, wood-frame building similar to the temporary support buildings constructed during the IIIC (SS-9) to IIIF (SS-18) conversion program. The TSAs were almost complete at the three complexes by January 1981 and unloading began at Kartaly and Uzhur Launch Group A during late January and early February 1981 (Figure 3). Silo unloading began at Dombarovskiy Launch Group A during mid-April 1981. Concurrent with unloading, empty three-car canister/capsule (CAN/CAP) trains arrived at the complex rail-to-road transfer points (RTPs) to transport the unloaded missiles out of the complex for inspection and probable refurbishment. Although an increase in SS-18 canisters has not been observed, the two facilities best suited to accomplish refurbishment are Bobrovskiy Missile Support Rear Depot (MSRD;) and/or Dnepropetrovsk Missile Development and Production Complex (DMDPC) Alternatively, if these missiles are not refurbished, they may be used at Tyura-

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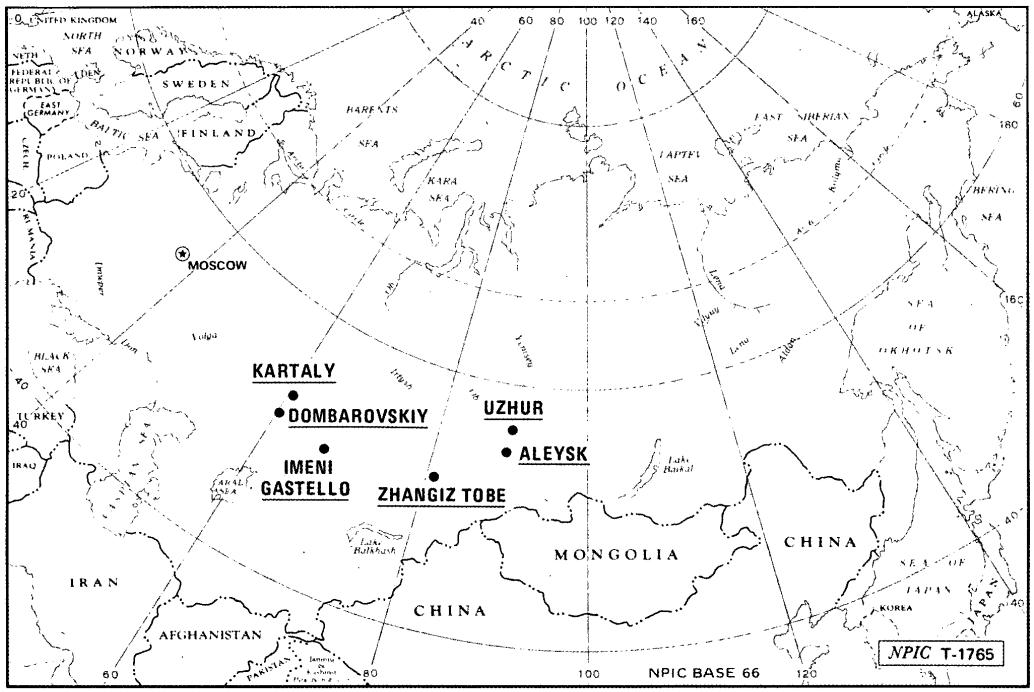

FIGURE 1. LOCATION OF DEPLOYED SS-18 ICBM COMPLEXES IN THE USSR

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tam Missile/Space Test Center [redacted] for crew training and/or missile development launches. 25X1
Bobrovskiy MSRD could also provide interim storage. At Kartaly ICBM RTP [redacted], the 25X1
replacement modified launch control capsule with associated containers arrived at the same time as the empty CAN/CAP trains. Shortly after their arrival, the empty CAN/CAP trains were loaded with missile canisters from Launch Group A (Figure 4). Five SS-18 MOD-3 missiles were launched from Uzhur Launch Group A between [redacted] (Figure 5). Three SS-18 probable MOD-2 25X1
missiles were launched from Kartaly Launch Group A during April 1981.[4]

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3. (TSR) After silo unloading, the first silo modification activity to occur is the excavation of the area around the silo door pocket and headworks. This is done to allow reconstruction of the upper silo facing, which serves as a retaining wall when upper silo components are removed. Gantry crane and concrete-block service apron construction usually begins at this time. The first component to be removed from the silo is the SS-18 in-silo suspension/shock isolation system[5] (Figure 6). The suspension cage, a component of the suspension/shock isolation system, is probably dismantled onsite. The IIIF silo door, door pocket, headworks, and headworks base are then removed from the silo and dismantled on the service apron (Figure 7). The replacement IIIF headwork sections are delivered to the launch site and assembled on the service apron. (At one site, the new headworks was being assembled on the service apron before the old headworks was removed [Figure 8]). To date, no replacement silo components have been installed. The launch site hardened antennas (dome and hook or plus antennas) will be replaced by their newer counterparts, the modified hardened dome antenna and the hardened linear antenna. In addition, the passageway from the partially underground security/surveillance building to its entrance is excavated while silo modifications are underway. No discernible modifications have been made to the exposed passageway to date.

Launch Control Facility Modifications

4. (TSR) Modifications at the LCF are designed to technically upgrade facilities and improve survivability. LCF modifications include the replacement of the launch control center (LCC) silo headworks; the probable addition of a second LCC silo headworks base; and the replacement of the silo door pocket, door, and LCC capsule. The original control support building is razed and a type III LCF control support building[6] is constructed. The type III LCF control support building is centered on and perpendicular to the LCC silo. It is probable that the hardened dome and washer antennas at the LCF will be modified or replaced. The underground passageway of the security/surveillance building at the LCF is also excavated.

Silo Modification Support Activity

5. (TSR) Silo modification program support has been observed in the complex support facilities of Dombarovskiy, Kartaly, and Uzhur SSM complexes. Support activity includes the arrival of empty CAN/CAP trains, replacement modified LCC capsules and associated containers, and replacement SS-18 MOD-4 missiles in the complex RTPs. New type IIIF and type IIIX LCC upper silo components have arrived in the silo materials receiving areas and the number of cable spools has significantly increased.

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Nuclear-associated railcars arrived in the RTPs to deliver new MOD-4 warheads and probably transport warheads removed from Launch Group A missiles to national-level nuclear storage sites.

SS-18 MOD-4 PAYLOAD RETROFIT

6. (TSR) The second program retrofits the SS-18 MOD-4 payload without silo modification to the nine launch groups completed in 1978. Retrofit without silo modification is possible because these nine launch groups utilized the same structurally modified silo components as the 20 launch groups completed in 1979 and 1980 where the SS-18 MOD-4 was initially deployed. Activity at the Aleysk complex support facilities and Aleysk Launch Group C indicates that retrofit of MOD-4 payloads will be incorporated into the SS-18 three-year major PM cycle (retrofit/PM) for the nine launch groups. Retrofitting a launch group with the SS-18 MOD-4 payload will probably take three to four months.

Retrofit Support Activity

7. (TSR) CAN/CAP trains arrived with new SS-18 [ ] upper canister sections, MOD-4-associated [ ] containers, and three SS-18 MOD-4-associated crates but without SS-18 lower missile canister sections. Two of the MOD-4-associated crates are transported on a [ ] railcar which usually carries the lower missile canister section. The third MOD-4-associated crate is transported on the same railcar as the MOD-4-associated container. This is a radical departure from normal procedure and was the first indication that only the payloads deployed in Launch Group C would be exchanged/retrofitted. MOD-4-associated containers are used to transport a component of the post-boost vehicle (PBV), probably the MOD-4 propulsion/guidance control structure (PGCS). The upper canister sections are taken to the SS-18 special support building for inspection and temporary storage. The PGCS is unloaded from its container, inspected in a corner bay of the special support building, and probably stored in the PBV building until taken to the [ ] for trial mating with the reentry vehicle support structure (RVSS). Nuclear-associated railcars deliver MOD-4 warheads to the RTP and probably transport the warheads removed from the launch group undergoing payload retrofit to a national-level nuclear storage site. In the [ ] the MOD-4 warheads are removed from their shipping canisters, inspected, and then mated to the RVSS. After trial mating with the PGCS, the RVSS (with warheads) is separated from the PGCS and transported to a launch site by the type V warhead transporter. The PGCS is then fueled in the propellant facility and transported to a launch site by the SS-18 payload-associated transporter (PAT). The SS-18 PAT is only associated with the MOD-4 payload.

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Launch Group Retrofit Activity

Launch Site Activity

8. (TSR) Retrofit/PM begins simultaneously at the LCF, the collocated launch site (Figure 9), and one additional site with the arrival of the PM/silo loading vehicles and housetrailers. At the two launch sites, activity begins with the removal of the horizontal damper fixture, the topmost component of the SS-18 in-silo suspension/shock isolation system. The SS-18 [redacted] upper canister section and the original payload (SS-18 MOD-1, -2, or -3) are then removed and probably transported to the complex RTP for shipment out of the complex. The horizontal damper fixture and upper canister section are normally removed during PM to access the SS-18 payload.* Normal PM and probable minor upper silo modifications to accommodate the MOD-4 payload are then accomplished. The arrival of SS-18 MOD-4-associated crates at the launch site confirms that MOD-4 retrofit is underway (Figure 10). The contents of the crates and their function within the silo have not been determined. After PM and the minor MOD-4-associated silo modifications are complete, the PGCS is mated to the second stage of the SS-18 booster. After the MOD-4 payload is mated to the PGCS, a new upper canister section is attached to the lower missile canister section and an SS-18 umbilical framework is lowered over the SS-18 canister. This framework is a checkout device used to insure proper missile-to-silo alignment. Once proper alignment is achieved, the umbilical framework is removed and the horizontal damper fixture is reinstalled. After the silo door is closed, final checkout and site cleanup takes place. The launch site is now ready to return to online alert status. At Aleysk ICBM Launch Sites 15C [redacted] and 18C [redacted] retrofit took 25 to 30 days per site. Retrofit of a launch group (six sites per group) will probably take three to four months. Normal PM lasts seven to ten days per site and four to six weeks per six-site launch group. During retrofit, a majority of the PM vehicles remain onsite and site support is provided by a TSA consisting of six to eight net-covered housetrailers.

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Launch Control Facility Retrofit/PM Activity

9. (TSR) Launch control facility MOD-4 retrofit/PM activity is supported by the LCF PM support vehicles and equipment, which includes five to eight housetrailers, eight to ten vehicles, and two to four stacks of canvas-covered materials/equipment. Retractable antennas in the silo headworks are raised on numerous occasions, probably in support of launch site to LCF command and control communications checks. The only discernible difference between normal PM and retrofit/PM is the duration of activity. Normal PM lasts four to six weeks, while retrofit/PM lasts 12 to 16 weeks because of the increased length of time required for launch site payload retrofit.

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(S) Comments and queries regarding this report are welcome. They may be directed to Soviet Strategic Forces Division, Imagery Exploitation Group, NPIC, 25X1 25X1

Place this footnote on page with para 8.

*Occasionally during PM, a payload is removed from one of the missiles in the launch group and probably returned to for detailed inspection and/or maintenance. The removal of more than one payload during PM is one of the first indications that other than normal PM is underway. Similar activity was observed at Aleysk Launch Group B in 1978 when the SS-18 MOD-2 payload was retrofitted. 25X1