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10 DOWNING STREET

Prime Minister

This article from
Aviation and Space Weekly
reflects the widening
disparities in Soviet and
American launch capabilities,
as well as in
surveillance / elint coverage.

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Soviet Military Space Flight Fails, Warning Satellite Placed In Wrong Orbit

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By Craig Covault

Washington—The Soviet Union had a serious space program failure Oct. 3 when an SL-6 booster launching a Soviet ballistic missile warning satellite malfunctioned, placing the military spacecraft in a useless orbit, U. S. analysts said last week.

The Soviets quickly recovered by using the same type of heavy booster 12 days later to launch another missile warning satellite, a demonstration of Soviet space program resilience that cannot be matched by the U. S., the analysts said.

This was the first Russian space accident this year. Since the start of 1986, however, the Soviets have launched at least 71 missions carrying at least 87 different satellites into orbit.

Launch Scrub

The U. S. has achieved only four space missions in 1986, and on Oct. 10 had to scrub another launch when a U. S. Air Force Scout booster carrying a USAF/Defense Nuclear Agency satellite malfunctioned during final countdown at Vandenberg AFB, Calif.

The booster's gyro system failed a checkout sequence at about T-5 hr. The malfunction has delayed until Nov. 7 the launch of a \$13-million Polar Beacon/Auroral Research payload carrying sensors sponsored by the Johns Hopkins Applied Physics and Air Force Geophysics laboratories.

The Vandenberg launch was to have been only the third U. S. military space

mission of the year, compared with over 70 Soviet military spacecraft launched thus far out of their 1986 total.

While the U. S. has been trying to recover from the Challenger, Titan and Delta accidents, the Soviets have introduced new military space operations with their imaging reconnaissance, ocean surveillance and electronic intelligence satellites.

Increased activity also was noted in the missile warning program prior to the Oct. 3 accident. The Soviets appeared to be starting a surge of missile warning satellite launches when the failure involving Cosmos 1,783 occurred, U. S. analysts said.

The Soviets normally maintain nine missile warning spacecraft in highly elliptical orbits extending up to 40,000 km. (24,000 mi.). In order to achieve the operational orbit, the booster first enters a low parking orbit. After less than an hour in that orbit, the booster's upper stage is reignited to achieve the higher trajectory.

During the Oct. 3 mission, however, the upper stage malfunctioned and prematurely shut down, leaving the infrared satellite traveling at least 1,000 fps. slower than required. The satellite is stranded in a useless orbit about 20,000 km. (12,000 mi.) below its planned altitude. The failure was the fifth in the last six years for the booster used on such missions.

On Oct. 15, however, the Soviets launched another missile warning satellite, Cosmos 1,785, into a proper orbit using the same three-stage SL-6 type booster, which is larger than the U. S. Titan 2.

Nine days later, they used the SL-6 to

place a Molniya spacecraft in orbit, again indicating no hesitancy to use the booster so soon after the Oct. 3 failure.

The Soviets also have been active with their nuclear-powered ocean surveillance satellite program.

The nuclear reactor core for the Cosmos 1,771 radar ocean surveillance satellite was boosted from its low operational orbit to a much higher orbit Oct. 15. This is standard procedure to prevent the hazardous reactor from accidental return to Earth following completion of this mission because of likely exhaustion of maneuvering fuel.

Modified Operations

There also have been recent modifications to Soviet operations in a second ocean surveillance class using elint-type electronic surveillance, according to Nicholas L. Johnson, advisory scientist for Teledyne Brown Engineering, who performs extensive analysis on Soviet space activities.

The USSR has been operating the first of the revised missions, Cosmos 1,735, in a lower altitude than previous ocean surveillance satellites. This has enabled it to repeat coverage of specific ocean areas every three days, rather than the four-day intervals of early Soviet missions, Johnson said.

The second significant change occurred with the Cosmos 1,737 electronic ocean surveillance spacecraft. It was launched into a 73.4-deg. orbit to provide enhanced coverage of the polar ocean regions, com-

pared with the 65-deg. inclinations used for previous spacecraft.

It also repeats its orbit every three days to detect Western naval movements.

A third electronic ocean surveillance spacecraft, Cosmos 1,769, launched Aug. 4, has been positioned to provide four-day repeat coverage using a 65-deg. orbit like that exercised most often in the past, Johnson said.

The Soviet military imaging reconnaissance satellite program also has just improved its mission operations.

In early October, the Soviets established a new duration record of 238 days for their most modern class of strategic reconnaissance satellite. The Soviets, also for the first time, demonstrated overlapping operations with two of these complex vehicles in simultaneous orbit. The vehicles are believed to use real-time image transmission through Soviet relay satellites and also may have a reconnaissance film-return capability.

Cosmos 1,731, which set the record, was returned to Earth Oct. 3. Before it was commanded down, however, the Soviets launched Cosmos 1,770 as a replacement, and then conducted two months of operations with both vehicles in orbit.

Changes in the Soviet elint spacecraft program designed to obtain strategic radio intelligence data also are being made.

The Soviets have begun increasing their constellation of six elint satellites to 12 by launching two spacecraft into each mission slot, rather than one as in the past.

The Soviets also enhanced their military/civil navigation satellite capability Sept. 16 by launching three Glonass navigation spacecraft on one booster.

Another Soviet military mission assisting ground operations is the Cosmos 1,776 radar calibration spacecraft. Following launch Sept. 3, this spacecraft ejected at least four radar calibration devices believed used for tracking tests by antiballistic missile radar installations in the USSR.

Soviet missions launched since mid-October in addition to the early warning satellite replacement are:

■ **Molniya-3**—The communications spacecraft was launched Oct. 21 into a 38,988 × 645-km. (23,392 × 387-mi.) orbit inclined 62.9 deg.

■ **Cosmos 1,786**—This spacecraft was launched Oct. 22 into a 2,589 × 198 km. (1,553 × 118 mi.) orbit inclined 64.9 deg. Few if any previous Soviet spacecraft have flown in such an orbit.

■ **Cosmos 1,787**—This military imaging reconnaissance satellite also was launched Oct. 22 and placed into a 290 × 215 km. (174 × 129 mi.) orbit inclined 70 deg. □