

Space programs retrenching in many nations; manned efforts suffer most

by Marsha Freeman

At the same time that the plans of the U.S. space program and the National Aeronautics and Space Administration's (NASA) budget have been under attack, the space programs in the Soviet Union and in Europe have also been contracting. Budget squeezes in every major space-faring nation except Japan are throwing long-range projects into chaos, and disrupting short-term space operations.

The most dramatic situation is that in the Soviet Union, where the visible civilian space effort is only a small portion of a much larger military capability, and, unlike the U.S., the two programs are intimately intertwined. There is *no* indication that there has been *any* pull-back or slow-down in Soviet strategic military space capabilities, such as beam weapon defense, anti-satellite systems, or reconnaissance satellites. In fact, with the increasing militarization and attempted re-centralization of Soviet foreign and domestic policy, it can be expected that these military space programs will accelerate.

But the chaotic domestic Soviet economic situation has led to a contraction of the more expensive manned space programs. According to analysts of the Soviet program, the civilian space budget has been cut by about 10% in each of the past two years.

James Oberg, a specialist on Soviet space affairs, has termed this a "major retrenchment". Oleg Y. Firsyuk, vice chairman for international affairs of the Soviet government-run Glavcosmos space agency, has described the country's spending on space as being in an "unstable position," according to *Aviation Week* magazine.

One problem has been the loss of centralized control. Manufacturing facilities that supply components and completed devices for the space program have shifted to produce items of more local interest than spacecraft. On Jan. 8, the *New York Times* quoted Nikolai N. Ponomarev-Stepnoi, deputy director of the prestigious Kurchatov Institute of Atomic Energy, that a factory that made space reactors "is now being converted for the manufacture of automatic systems for producing, of all things, milk cartons."

On Nov. 23, a Gorizont communications satellite was launched, which is owned and will be managed by the Russian Soviet Federated Republic, and which paid the Soviet Defense Ministry to launch it. This state of program organization would be comparable to the state of Alabama launch-

ing its own communications satellite, which could lead to a chaotic situation in terms of achieving an overall space program objective.

Soviet manned programs suffer

A series of manned space stations has been the jewel of the public Soviet space effort since the early 1970s. The Soviets hold all records for long-duration manned space missions. When the currently operating Mir space station was launched in early 1986, it was advertised as the first permanently manned space station. Yet, in 1988, it was vacant for four months, as the Soviets decided not to send a crew to man the station. Three-man crews have now been replaced by two-man cosmonaut teams.

The Mir station is of a modular design, with six docking ports around the central core. The announced plan was to have four major laboratory and living modules docked to the Mir by 1990, to extend its capabilities. So far, only two have been added. Both technical and budgetary problems have been cited as the causes.

Instead, the Soviets have attempted to commercialize the Mir, in the same way they have desperately tried to attract foreign currency by offering to sell space services such as Proton booster launches and Earth remote-sensing images. The Japanese Tokyo Broadcasting System recently paid the Russians over \$12 million to fly a journalist to the Mir, and other deals are in the making. U.S. companies, frustrated with the equivocation surrounding the Space Station Freedom, are contracting laboratory space for science experiments aboard the Soviet station. It has recently been mooted that a U.S. astronaut will train for a stay on the Mir, and that a cosmonaut may participate in the U.S. program.

One of the most mysterious Soviet space capabilities has been the Buran Space Shuttle, modeled after the U.S. Space Shuttle orbiters. The Buran underwent its first flight test in November 1988 in an unmanned, automatic mode. The Russians announced that it would be flown manned "soon," and would make up to four flights per year to the Mir, but it has not been tested since its maiden flight. James Oberg has commented that the "question is not when, but if, it will ever fly again."

The empty, previous-generation Salyut 7 space station is currently heading toward a fiery Earth reentry in the next few weeks, because the Soviet shuttle was not ready to rendez-

vous with it to bring at least parts of it back to Earth, as had been planned.

In May 1987, the Soviets flight-tested their Energia heavy-lift rocket, which is the first such heavy-lift capability developed since the U.S. ended production of the Saturn V. Two years later, after flights were delayed due to technical problems, a formal announcement was made that the flight rate would be slow due to a lack of payloads. One primary mission for the Energia had been to carry the Buran shuttle into Earth orbit, but that launch schedule has been stretched out.

Soviet officials have also stated that budgetary constraints meant that space science payloads would not be ready on time. The next launch of the Energia was supposed to have been in 1990, but it never took place.

In September 1989, Boris I. Gubanov, Energia's chief designer, explained that 1.2 million people in the Soviet Union were employed in the Energia and space shuttle programs. "If we start implementing an austerity plan, we'll destroy everything we've done up to now," he stated. Later that year, the 1990 Energia launch was canceled, with the next planned flight some time in 1991.

Soviets selling space reactor to U.S.

The most recent indication of how anxious the Soviets are to gain foreign currency, is the announced sale of a Topaz space nuclear reactor to the United States. The Soviets have used a family of space nuclear reactors, primarily for ocean reconnaissance satellites, for a number of years. The U.S. is not planning to fly such a reactor until near the turn of the century.

One year ago, Soviet scientists attending the annual conference on space nuclear power in Albuquerque, New Mexico, astonished the audience by declassifying the advanced Topaz nuclear design in technical papers they presented. A U.S. company offered to broker the technology, and apparently the offer has been accepted.

The newly won independence of nations in Eastern Europe has also put pressure on the Soviet space program. The fine technical capabilities of the Carl Zeiss company, formerly in East Germany, for example, which has years of experience in developing space optics systems, will now be coordinated with programs in the former West Germany, and will be less integrated with the Soviet programs.

But the situation is not unique to the U.S.S.R. Large Western European space projects have come under heavy budgetary attack as well.

European, U.S. programs cut back

For the past few years, there has been pressure from the British government to cut-back spending by the European Space Agency (ESA) on its large, manned programs, and more recently, pressure had come also from West Germany. The Europeans have committed to build the Columbus laboratory module for Freedom, in addition to an unmanned free-flyer for experiments coordinated with the Space Station. As

well, the French have organized an effort to build a small European space shuttle called Hermes, which other European nations are contributing to. The Ariane 5, which will be the launch vehicle to carry the Hermes and will be the first European booster reliable enough to carry astronauts, is also under development.

This year, all three projects will move from the design to the hardware stage, if ESA members decide to proceed, which will involve an approximate \$12 billion price tag for all three programs. Britain has opted out of participation in Hermes, Ariane 5, and Columbus, stating that it is too risky and costly, and also unnecessary for Europe to have an independent manned space capability. There have been technical design problems with Hermes, and doubts about the U.S. commitment to Freedom.

In October, Wolfgang Wild, the director of the German Space Agency DARA, called for the stretchout of both the Columbus and Hermes programs at the annual meeting of the International Astronautical Federation held in the German city of Dresden. Three years ago, Germany requested that the ESA budget be cut 15-20%. West German aerospace managers have pointed out that the economic strain of the unification of Germany will translate into less money available for the space program.

This spring ESA officials will make decisions which will determine the direction of the European space programs to the turn of the century. At this point, member nations are not confident they can continue to finance a full range of manned space programs, while pushing forward on the high-quality technologies for planetary and space science.

In the United States, there has been virtually no institutional opposition to the demoralized recommendations of the Advisory Committee on the Future of the U.S. Space Program to, in effect, phase out NASA's manned space programs. In hearings on Jan. 3 before House Committee on Science, Space, and Technology, Advisory Committee chairman Norman Augustine stressed the belief of the group that there is no future for the U.S. in space.

Augustine repeated to dismayed committee members the unsupportable belief that there is a "lack of consensus of what should be the goals" of the U.S. space program. Rep. Glen Browder (D-Ala.) asked the most profound question to the witness, regarding the committee's proposal that the manned missions to the Moon and Mars be undertaken only as the money becomes available. "Do you have any evidence to show that a go-as-you-pay program is not a not-going-anywhere program?" Browder asked. He reminded Augustine that the history of the space program showed that great things were accomplished when there were "bold goals."

Augustine responded that the difference with the Apollo program is that we then "thought we were in a race with the Soviets," and that more of GNP was being spent on space than "we would propose, even as advocates of the space program," today.