Order Code IB87018

SPACE POLICY

Updated June 29, 1987

by

Patricia Humphlett and Marcia Smith

Science Policy Research Division

Congressional Research Service

CONTENTS

SPACE POLICY

SUMMARY

The space shuttle Challenger accident and the resulting investigation, combined with other launch vehicle failures in 1986 and 1987, have had an impact on both civilian and military space programs. Traditionally, Congress debates space issues in the context of funding bills for the National Aeronautics and Space Administration (NASA) and the Department of Defense (DOD). Most oversight of the issues discussed here occurs at the committee level during authorization and appropriation hearings. However, because of the attention the shuttle accident has drawn, and because of the overlap between NASA and DOD, some feel it is time for Congress to look at space policy more broadly. Some Members believe that the shuttle accident and NASA's response indicates that NASA is poorly managed and requires closer congressional oversight. Conversely, some charge that Congress is micromanaging budgetary issues.

The National Aeronautics and Space Administration (NASA) was established in 1958 as the civilian space agency while military space activities continued in the Department of Defense (DOD). NASA's current programs include the space shuttle, which is the cornerstone of manned space activities as well as a major launch vehicle, and the newest major initiative, a permanently manned space station. In addition, NASA conducts research in space science and applications and promotes the commercial use of space. In an era of fiscal restraint, there is some concern that the development of the space station will detract from other programs, particularly space science. DOD also uses space for a variety of support functions, including reconnaissance, communications, weather, and navigation. DOD's space budget has far surpassed NASA's budget, causing some to reexamine the interface between the two programs. Both NASA and DOD have had to deal with launch vehicle failures.

Returning the shuttle to safe operation is attracting considerable attention in Congress, along with NASA's plans to build a permanently occupied space station. NASA's management and operation of the shuttle and NASA and DOD's use of expendable launch vehicles (ELVs) is affecting the private sector firms producing ELVs and looking for launch service contracts. NASA's support for private sector activities is being reevaluated. Congress is concerned with how space policy is made and by whom, and whether Congress can get increased access to the policy-making mechanism. Finally, the need for long-term goals to guide the space program is being discussed.

ISSUE DEFINITION

In the wake of the Challenger tragedy and other launch vehicle failures in 1986 affecting both civilian and national security space missions, Congress is paying more attention to space activities and their underlying policy than at any time since the beginning of the Apollo program. The dominant issues include NASA's continued recovery from the shuttle accident, plans for building a space station, NASA management, duplication between NASA and DOD, commercialization and privatization of space, the space policy decision-making mechanism, and long-term goals. Coupled with the strong increase in military space activities, space policy has been catapulted once again into the national scene.

Traditionally, space issues are debated in the context of funding bills for the National Aeronautics and Space Administration (NASA) and the Department of Defense (DOD). Most oversight of the issues discussed here will probably occur at the committee level during authorization and appropriation hearings. However, in the aftermath of the shuttle accident, some feel it is time for Congress to look at space policy more broadly.

BACKGROUND AND ANALYSIS

The U.S. Civilian Space Program

The National Aeronautics and Space Act of 1958 (P.L. 85-568) outlines objectives for NASA in both aeronautical and space activities. NASA's space objectives include: (1) the expansion of human knowledge, (2) the improvement of space vehicles, (3) the development and operation of space transportation systems, (4) the establishment of long-range studies of space activities for peaceful and scientific purposes, (5) the preservation of the United States as a leader in space science and technology and in their application for peaceful purposes, (6) the transfer of information to other agencies, and (7) international cooperation.

The establishment of NASA, incorporating the National Advisory Committee on Aeronautics (NACA), symbolized the entrance of the United States into the space age. The Soviet Union had successfully orbited the first artificial satellite, Sputnik, in October 1957, lending the U.S. space program a new urgency. The first U.S. satellite, Explorer 1, was orbited in January 1958. In 1961, President Kennedy announced that the United States intended to put a man on the Moon within a decade. The Apollo program, costing approximately $25 billion (then-year dollars), achieved this goal in 1969, when two astronauts landed on the Moon. Meanwhile, the 1960s witnessed the development of communications and meteorological satellites, and a wide range of spacecraft for space science missions in Earth orbit or beyond. Apollo was followed by the Skylab space station program (to which three crews were sent in 1973-1974) and the Apollo-Soyuz Test Project in which a U.S. Apollo and a Soviet Soyuz docked for two days of joint experiments. These successes did not provide the immediate momentum for major follow-on programs such as a permanent manned space station or a manned mission to Mars, as some had

predicted. However, in 1972 President Nixon approved NASA's space shuttle program, and in 1984 President Reagan endorsed development of a permanently occupied space station for operation in the mid-1990s.

Although NASA is the primary agency for conducting civilian space activities in the United States, other agencies are also involved. The next largest is the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce, which operates civilian weather satellites. Several other agencies are data users or are otherwise involved in space policy.

Military Space Activities

The creation of NASA in 1958 was a deliberate step by the Eisenhower Administration to separate military and civilian space activities. President Eisenhower wanted to stress to the world that the United States was interested in the peaceful uses of space, but he recognized that space had military applications as well. The National Aeronautics and Space Act specified that military space activities would be conducted under the purview of the Department of Defense.

The Department of Defense (DOD) uses space for a variety of support functions -- reconnaissance (including photographic, electronic, early warning, and nuclear explosion detection), communications, weather, and navigation. In addition, DOD has a major interest in the possibilities of space-based weapons. The military space budget surpassed NASA's for the first time in 1982, and currently is about twice that of NASA.

In 1959, the United States conducted the first test of an antisatellite (ASAT) device to destroy satellites. This capability was deemed necessary not only so that Soviet satellites could be destroyed in times of hostilities, but also because there was concern that the Soviets might place offensive weapons in orbit. Although that ASAT program did not proceed to deployment, by 1964 the United States had an operational ASAT system using ground based missiles on Johnston Island. The system was decommissioned in 1975, and development of a new type of ASAT device using an air-launched homing interceptor began in 1977. That system is now the subject of considerable controversy in Congress and testing of the system is strictly limited. The Soviet Union developed its own ASAT system in the late 1960s, which DOD has considered operational since the 1970s. The debate over ASAT devices is discussed in CRS Issue Brief 85176.

The development of the U.S. air-launched ASAT sparked a more general debate about the "weaponization" of space that was expanded in 1983 by the announcement by President Reagan that he planned to investigate whether a strategic defense system should be developed to destroy incoming ballistic missiles, which might use space-based weapons. Called the Strategic Defense Initiative (SDI), or "Star Wars," this program has been the subject of considerable debate in Congress as well as a topic of strong international controversy (see CRS Report 86-8 and Issue Brief 85170). The program is still in a research phase, so it is not clear what part of it might be space-based. If the United States decides to deploy such a system, support functions of launch detection and missile tracking will

almost certainly involve satellites, but whether the weapons to destroy the missiles will be based in space remains an open question.

The ASAT and SDI debates naturally involve space policy in a broad sense, but the issues that surround them are more closely related to arms control and national security. Therefore, these subjects are not discussed at length in this issue brief.

Civilian/Military Interface

The separation between military and civilian space activities has remained in place throughout the history of the U.S. space program, but the functions performed by satellites and the vehicles that launch them are not easily divided. Both sectors use communications, navigation, weather, and remote sensing/reconnaissance satellites, which may operate at different frequencies or have different capabilities, but have similar technology. Furthermore, the same launch vehicles can be used to launch any type of military, civilian, or commercial satellite. This has become more apparent since the recent launch vehicles failures, as both DOD and NASA consider launch recovery options. In the area of launch vehicles, some have argued that increased redundancy is needed. In other areas, increased cooperation may allow a decrease in duplication.

The National Aeronautics and Space Act established a civilian/military liaison committee, dissolved in 1965, and the National Aeronautics and Space Council in the Executive Office of the President, abolished in 1973. Coordination has continued through interagency committees. President Reagan created the Senior Interagency Group/Space (SIG/Space) in 1982 to coordinate space policy, and its members include NASA, DOD, and other agencies involved in space policy, including the intelligence community. SIG/Space has been in the center of many policy decisions following the shuttle accident and is discussed in the issues section below.

Space Program Status

There are many issues facing the U.S. space program today, most of which center on NASA's program. As noted above, the most controversial military space activities (ASAT and SDI) are not discussed at length in this issue brief since their main issues are related to arms control and national security, rather than space policy.

Space Shuttle

The cornerstone of the U.S. manned space program is the space shuttle, or the space transportation system (STS), a partially reusable space vehicle. In 1972, President Nixon approved the shuttle program, and announced that it would be the Nation's primary launch vehicle, meeting a wide range of requirements. The first shuttle flight took place on Apr. 12, 1981. Through January 1986, there were a total of 24 flights, including two dedicated military flights. The 25th flight, on Jan. 28, 1986, ended in an explosion just after launch, the most serious space

accident in U.S. history. The shuttle accident and resulting investigation are discussed in CRS Issue Brief 86015.

The space shuttle has been used for a variety of operations. It serves as a satellite launch vehicle for government (military and civilian) and commercial satellites, often in conjunction with an upper stage, which carries the satellite to an orbit higher than the shuttle's capability. Space shuttle crews are also able to retrieve and repair satellites, and have conducted scientific research, some with potential commercial application. Several flights have been dedicated to Spacelab, a space science payload, providing a working environment in which the crew can conduct experiments.

NASA currently plans to resume shuttle flights in June 1988, but, in the meantime, the grounding of the shuttle has affected all users. In August 1986, President Reagan initiated a policy to limit the use of the shuttle by commercial customers to those with shuttle-unique spacecraft (see below). NASA has released a manifest for the first seven years after resuming operations which allocates 41% of flights to DOD, 47% to NASA (including space science and the space station), and 12% to commercial and foreign users. This represents an increase in flights for DOD, and a decrease for non-Government users. Bringing the shuttle back to safe operation and the Government's use of expendable launch vehicles are discussed in the Issues section below.

Space Station

In his 1984 State of the Union Address, President Reagan directed NASA to build a space station capable of being permanently occupied. NASA has described this program as the "next logical step" following the shuttle. New cost estimates in 1987 showed a dramatic increase in estimated costs for the space station (from $8 billion to $14.5 billion in FY84 dollars). Another $3-4 billion is expected to be spent by Japan, Canada, and the European Space Agency for their contributions to space station hardware. The space station will include one central structure and separate platforms located near the station or in polar orbit, and could be used for a variety of scientific and commercial applications. Negotiations with Europe, Japan and Canada are currently underway for their participation in the project.

Congress has raised several issues related to the funding and timing of the space station, as well as questions on some of its specific components. Currently, the major issues involve space station costs and DOD use of the station. [For additional information on the space station, see CRS Issue Brief 85209.]

Launch Vehicles: "Mixed Fleet" and Private ELVs

A series of launch failures in 1986, compounded by a limited availability of various launch vehicles, created a severe shortage in capability to launch U.S. satellites. The United States has four expendable launch vehicles (ELVs), Scout, Delta, Atlas, and Titan, and one reusable system, the space shuttle. When the shuttle program was approved in 1972, it was with the intent that it would replace all the ELVs.

Although the Government stopped ordering Atlas and Delta vehicles as planned, in 1984 the Air Force decided to retain the Titan family of vehicles and to add a new member (the Titan IV).

The space shuttle Challenger tragedy in January 1986 not only took the lives of seven astronauts, but grounded one of the major U.S. launch vehicles. It was followed by the explosion of a Titan and a Delta. Atlas vehicles have components similar to Delta, so they were also grounded for several months. Delta and Atlas were both flying by the end of 1986, and one version of the Titan resumed service in early 1987, but the shuttle will not fly again until 1988. One of the last remaining Atlas vehicles was destroyed during a launch attempt in March 1987 when it was hit by lightning.

These launch vehicle failures have severely complicated plans to launch satellites and has led to a governmental decision to have a "mixed fleet" of launch vehicles in which there will be several different types of vehicles available. In 1986, DOD selected McDonnell Douglas to build a new medium launch vehicle, MLV, based on the Delta design (called Delta II), and began considering a new advanced launch system (ALS). NASA and DOD are still determining the respective roles each should play in the development of the ALS program; DOD wants it for the Strategic Defense Initiative, while NASA may use it for the space station. NASA recently announced its plan to acquire launch services from the private sector. Initially, it will do so noncompetitively, but by 1991 NASA will acquire 5-9 launches on a competitive basis. The Department of Commerce is also interested in launching its weather satellites on private vehicles.

Several private companies are marketing launch vehicles for commercial launches. Attempts to "privatize" or "commercialize" launch vehicles date back to the early 1980s, but entrepreneurial companies encountered many problems. Companies with a guaranteed Government market have an advantage because making additional vehicles available to commercial users is less risky than maintaining a production line for only commercial users. Smaller companies that do not have guaranteed Government markets face greater risk. DOD recently awarded the Delta II contract to McDonnell Douglas, with the explicit intent that the Delta II be offered on the commercial market as well. McDonnell Douglas announced in April 1987 that it had nine reservations for commercial launches. Martin Marietta, which builds the Titan family, announced at the same time that it had a waiting list of 10 clients.

Space Science and Applications

NASA conducts space science programs to study the Earth and its environment, the Moon, other planets, the Sun and the universe. There are concerns that it will be increasingly difficult to fund new space science programs while NASA is developing the space station and recovering from the shuttle accident. The space science community has often argued that the expensive manned programs dominate NASA's budget, overshadowing space science. In addition, space science projects are also becoming increasingly costly, making them more difficult to fund. NASA budget requests have not included many new space science programs, nor has Congress added funds for major new programs.

Several major space science payloads were to have been launched on the shuttle in 1986: the Hubble Space Telescope (which will allow astronomers to see objects 10 times more clearly than from Earth), Ulysses (a European probe to study the polar regions of the sun), and the Galileo mission to Jupiter. Other major space science missions in development are the Magellan Venus radar mapping mission, the Mars Observer, and the Gamma Ray Observatory. The Space Telescope is scheduled for the fifth shuttle flight, and Ulysses and Galileo are on the shuttle manifest for 1989 and 1990. Reportedly, NASA is considering using ELVs to launch some of its planetary missions since a decision was made after the Challenger accident not to use a special high energy upper stage, the Centaur, with the shuttle.

In addition to space science, NASA continues to conduct advanced R&D for applications such as communications satellites and remote sensing, although the operation of these satellites is conducted outside of NASA. The major applications R&D program in which NASA is now engaged is the Advanced Communications Technology Satellite (ACTS) program, for which funding has been cut repeatedly by the Office of Management and Budget; there has, however, been sufficient support in Congress to reinstate funding.

Commercialization of Space

Through language in the FY85 NASA authorization bill, Congress amended the National Aeronautics and Space Act requiring NASA to encourage "the fullest commercial use of space." In 1984, NASA established its Office of Commercial Programs, following a Presidential policy statement (see below). Commercial space activities had been taking place long before that time; for example, some communications satellites have been commercially operated since 1965.

NASA and the private sector are now pursuing commercial activities in materials processing and on-orbit services. Materials processing is based on the ability to produce pure substances or new materials in microgravity, either on the space shuttle or the space station. Private companies also see a future market for on-orbit services, delivering fuel or supplies or providing space modules in addition to those proposed by NASA. Many of these ventures are dependent on use of the shuttle and will have low priority when the shuttle resumes flight, as is discussed in the issues section below.

Landsat

Since 1972, the United States had launched a series of remote sensing satellites called "Landsat" for monitoring the Earth's surface. Landsat data are used for crop forecasting, mineral exploration, land use management, and similar activities. Developed by NASA, the Landsat system was turned over to the National Oceanic and Atmospheric Administration (NOAA) in the Department of Commerce in 1979. Plans to turn operations over to the private sector were accelerated by the Reagan Administration, and in 1984 Congress passed the Land Remote Sensing Commercialization Act to provide for private operation of the system.

In 1985, a contractor named EOSAT was selected to operate the two existing Landsat satellites and to build and launch two more. The Reagan Administration promised EOSAT $250 million over several years to facilitate the transfer. Since then, EOSAT has been embroiled in a tug of war between the Administration and Congress over upholding that commitment. (See Issues section below.)

Reagan Administration Policy

In the aftermath of the Challenger accident, the Reagan Administration is reportedly planning to revisit its space policy to reflect recent changes. However, existing policies are described here as a point of reference.

In a 1982 directive, President Reagan outlined U.S. goals in space, including national security, international leadership, and scientific and economic benefits. The directive also created the Senior Interagency Group on Space (SIG/Space) to provide a policy forum for all Federal agencies involved in civilian and military space activities. The effectiveness of SIG/Space as a policy-making group is discussed below.

General U.S. goals in space were also the subject of the National Space Strategy, released in August 1984. The 1984 strategy also directed several agencies to identify requirements for future launch technology. NASA and DOD headed the National Space Transportation System Architecture study, which has been forwarded to the White House.

Commercialization of space was a major initiative in the Administration's space policy, and may be the most affected by the lack of shuttle flights. In May 1983, President Reagan issued a policy regarding the commercialization of ELVs, stating that the Government would facilitate the transfer of ELV operations to the private sector. In February 1984, he issued an Executive order designating the Department of Transportation as the lead agency. In August 1986, Reagan announced that the shuttle system would be limited to launching payloads that were shuttle-unique, in order to make better use of the shuttle and to support the private ELV industry, which has had difficulty in getting customers.

President Reagan issued a more general policy to promote the commercial use of space in July 1984, including initiatives in four different areas: economic, legal and regulatory, research and development, and implementation of policy. As a result, NASA created a new office to encourage private sector participation in space.

In the 1984 State of the Union address, Reagan directed NASA to build a permanently manned space station within a decade. The President's endorsement was the key to getting such a major new program funded.

International Cooperation and Competition

The National Aeronautics and Space Act specifically states that NASA conduct international space activities, and since 1958, it has entered into more than 1,000 agreements with over 100 countries. Many countries

have been important players in the space arena and some have begun to demand that the United States treat them as equal partners. International negotiations on space station cooperation have revolved around this issue.

Cooperation and competition between the United States and Soviet Union, as the world's superpowers, attracts much attention. The most notable example of cooperation was the Apollo-Soyuz Test Project in 1975. In recent years the Soviets tied cooperation in civilian space activities to dismantling the SDI program. In the summer of 1986, however, they decoupled the two activities and negotiations began in September 1986 to develop a new cooperative agreement. According to press accounts, agreement has been reached and an accord is now ready to be signed by leaders of both countries.

The United States is also facing competition in space. The Soviet Union, Japan, China, India, and the European Space Agency (ESA) can launch satellites. ESA, comprised of thirteen European countries, developed the Ariane launch vehicle, now being operated by a private company, Arianespace, in competition with the U.S. shuttle. A launch failure grounded the vehicle in 1986; Arianespace expects to resume launches in 1987. China also has begun to have success in marketing its launch vehicles worldwide. Even the Soviet Union has become interested in the commercial prospects of launch vehicles, selling remote sensing data, and flying materials processing experiments for other countries. Other areas of competition include: France in remote sensing, Europe and Japan in communications satellite technology and future generation launch vehicles, and Germany in materials processing.

Issues

Space issues have traditionally been debated in the context of NASA's and DOD's funding bills. The authorizing and appropriating committees are most actively involved in oversight on these issues. However, in the aftermath of the shuttle accident, and because of the overlap between military and civilian space activities, there may be increased interest in space policy. The dominant issues are likely to include:

Space Station

Of the myriad issues surrounding the space station program, the two most controversial are cost and DOD use of the station.

The increased cost estimate for the space station announced in April 1987 led the White House to propose building it in two phases. Phase I would cost $12.2 billion (FY84 dollars) while Phase II would cost $3.8 billion (FY84 dollars), for a total of $16 billion, twice the original estimate. This decision did not signal a complete commitment to the program by the White House, since the plan must now be reviewed by the National Research Council (of the National Academy of Sciences). NRC is expected to complete its review by Sept. 1, 1987. Meanwhile, NASA wants to release the requests for proposals (RFPs) for the final stage (Phase C/D) of space station design and development, so that contract awards can be made in October 1987. The final decisions regarding the space station

must await the NRC review, however, and the FY89 budget request will reflect that review. Nevertheless, NASA states that its request of $767 million for the space station in FY88 stands. The decision on Phase II of the program is not planned until 1991. Congress has not decided whether to fund the program with a multi-year authorization at a steady level for the next decade, a multi-year authorization with a bell-shaped funding profile (the typical way such programs are funded), or without a multi-year authorization at all. Congress will debate the impact of space station funding requirements on other NASA programs and NASA's ability to contain space station cost growth in the coming year.

Another issue is the extent to which DOD should be able to use the space station. DOD has made clear that although it cannot identify any specific needs at this time, it wants to retain the option of using the space station, even if it means that other countries will not participate in the program. Legislation has been introduced (H.R. 1733) to prevent DOD from using the space station at all. Other points of view argue that DOD should be allowed to perform research, but not test or deploy weapons systems, while still others assert that DOD should be allowed to use the space station for any and all national security purposes.

Returning the Shuttle to Safe Operation

Getting the space shuttle back into service as a safe, reliable means of space transportation will be NASA's focus of attention in the next year. The Presidential commission which investigated the cause of the shuttle accident (the Rogers Commission) released a report recommending corrective actions in June 1986. Thirty days after the report was released, NASA responded with a plan for making the required design and management changes to return the shuttle to safe operation. NASA currently estimates that the shuttle will resume flights in February 1988. Already there are indications that it may not be possible to meet that launch date. Both the Defense and NASA authorizing committees, through oversight, will likely probe to determine whether safety is at risk in order to meet the new schedule. The National Research Council has criticized NASA's new flight rate estimates as being too optimistic. NASA may be in the difficult position of trying to balance caution with the practical need to maintain program and political momentum. There are critics both within and outside of NASA who are concerned that, for example, a design change made to the solid rocket booster seal is not safe enough.

Landsat

The Reagan Administration's commitment to providing EOSAT with the promised funding to facilitate transfer of Landsat to the private sector has proved weak. The FY87 budget request for NOAA included no funding for the EOSAT contract. Congress restored some of the funding and directed NOAA to find the rest within its budget and to provide a new commercialization plan. The plan was submitted in late 1986, but called for less Government subsidization of EOSAT and only one more Landsat satellite. Congress rejected the new plan because it did not provide two follow-on satellites, which Congress considers necessary for commercialization. NOAA's FY88 budget request includes funding for EOSAT

(for the one-satellite plan), but the FY87 funding has not been released and EOSAT began laying off employees at the end of 1986. Currently, Congress and the Administration are at a standoff over one versus two satellites as Congress considers FY87 supplemental funding. Other countries have remote sensing programs: France is already marketing data from its land remote sensing satellite SPOT; the Soviet Union has indicated interest in selling its remote sensing data; and Japan and the European Space Agency are each planning remote sensing satellites in the near future as well. (For additional information, see CRS Report 87-477 SPR, Privatization of the Landsat Remote Sensing Satellite System: Current Issues.)

NASA Management

Congressional interest in NASA management covers a range of issues, including how NASA is managing specific programs, whether NASA has properly assigned priorities among programs, and whether NASA's internal structure is optimal for handling its responsibilities. In the first case, the House Appropriations Committee has been overseeing several specific aspects of the space station program, including power level and international participation. Some have charged that Congress is trying to micromanage the program. Because of the size of the program and its complexity, and because of management problems discovered in NASA following the Challenger accident, detailed oversight is likely to continue.

The second issue concerns the trade-off within NASA among different programs, and whether NASA's commitment to larger programs, such as shuttle and space station, drains resources from other activities, such as space science and applications. In the face of budgetary constraints and rising program costs, difficult choices may have to be made during the 100th Congress.

Finally, the Rogers Commission report on the shuttle accident recommended that NASA review its management structure. NASA contracted a management study, headed by General Samuel Phillips (Ret.), which resulted in many changes at NASA. Congress will be assessing whether they are the right changes.

Duplication between NASA and DOD

As budgets continue to be constrained, Congress may reevaluate duplication between the civilian and military space programs. The FY87 decision to have DOD provide the money to replace the space shuttle Challenger (but in the NASA budget) may presage a growing awareness of the close relationship between military and civilian space activities. When the shuttle resumes operations, DOD will use nearly half of all flights and this may also draw attention to military activities. NASA and DOD have begun to study future launch vehicle requirements, in preparation for determining an R&D and/or procurement program. Both agencies are funding research on the National Aerospace Plane, although NASA is providing a small percentage of the total.

Commercialization of Space

Although commercial opportunities in space have been considered by NASA to have great potential, skeptics have questioned the possibilities from the start. The grounding of the shuttle has at least delayed commercial activity, and may have caused serious long-term damage if companies lose confidence in the Government's ability to assure them access to space. NASA and some private companies are investigating possible ways to continue experimentation on the ground or through the use of ELVs during the hiatus in shuttle flights. NASA has a number of agreements to provide free shuttle flights to support commercialization, and recently released guidelines for scheduling commercial payloads on the shuttle when it resumes flight.

Private ELVs

In the privatization area, several firms are actively marketing ELV services and have benefitted from recent Government initiatives to support the industry. At issue is the amount of support and/or encouragement the Government needs to provide to prospective private launching services and whether NASA should purchase ELVs or ELV services from the private sector. In addition, the Federal Government represents a large share of the demand for launches, raising the question of whether a truly commercial launch services industry can emerge if some companies have guaranteed Government markets.

Space Policy Decision-Making Mechanism

The Senior Interagency Group/Space has come under increased scrutiny since the Challenger accident. The 99th Congress passed a provision in H.R. 5495, the FY87 NASA authorization bill, to replace SIG/Space with the National Space Council. The provision essentially would have reestablished the National Aeronautics and Space Council, originally created by the National Aeronautics and Space Act, but without the aeronautics component. However, President Reagan vetoed the bill because of objections to the Council, as well as to other provisions. The reasons for replacing SIG/Space with the Council include that it would involve higher level officials to speed decision-making and create a permanent staff for space policy. Legislation has been introduced in the 100th Congress to recreate the Council.

Long-Term Goals

Congress and the executive branch will consider long-term goals for the space program as they review the report of the National Commission on Space. The Commission, created by Congress, completed its report in 1986 and laid out an ambitious agenda for the U.S. space program over the next 50 years. NASA plans to announce its proposal for implementing the Commission's recommendations in 1987. Some observers have stated that it is very important to define long-term goals combined with a program for their implementation if the U.S. is to continue as a leader in space. NASA's authorizing and appropriations committees may want to examine the question of long-term goals in conjunction with budget decisions for the upcoming fiscal years and future years.

LEGISLATION

H.R. 1733 (Mineta)
Prohibits use of the space station by or on behalf of the Department of Defense. Introduced Mar. 19, 1987; referred to Committee on Science, Space, and Technology.

H.R. 1741 (Roe)
Authorizes FY88 appropriations for NASA. Introduced Mar. 31, 1987; referred to Committee on Science, Space, and Technology.

S. 1164 (Riegle)
Authorizes FY88 appropriations for NASA. Introduced May 7, 1987; referred to Committee on Commerce.

CONGRESSIONAL HEARINGS, REPORTS, AND DOCUMENTS

U.S. Congress. House. Committee on Science and Technology./ Committee on Armed Services. Assured access to space during the 1990s. Hearings, 99th Congress, 1st session. July 23-25, 1986. Washington, U.S. Govt. Print. Off., 1986. 183 p. (Also Report, Jan. 1986. 29 p.)

U.S. Congress. House. Committee on Science and Technology. NASA's long range plans. Hearings, 99th Congress, 1st session. Sept. 17, 19, 1985. Washington, U.S. Govt. Print. Off., 1986. 221 p.

----- Space science and the space station. Hearings, 99th Congress, 1st session. Sept. 24, 1985. Washington, U.S. Govt. Print. Off., 1986. 85 p.

----- Strategy for safely returning the space shuttle to flight status. Hearing, 99th Congress, 2d session. May 15, 1986. Washington, U.S. Govt. Print. Off., 1986. 121 p.

----- United States civilian space programs. Vols. I & II. Reports prepared by the Congressional Research Service. Washington, U.S. Govt. Print. Off., 1981 & 1983. 1339 & 381 p.
Committee prints.

U.S. Congress. Senate. Committee on Commerce, Science, and Transportation. Soviet space programs: 1976-1980, parts 1-3. Prepared by the Congressional Research Service. Washington, U.S. Govt. Print. Off., 1982, 1984, 1985.

CHRONOLOGY

04/03/87 --- President Reagan announced new "phased approach" to building the space station and new cost estimates for the program showing a dramatic increase.

08/15/86 --- President Reagan announced his decision to procure a replacement shuttle orbiter and to limit the use of the shuttle to

shuttle-unique payloads, limiting its use for commercial payloads.

05/23/86 --- The National Commission on Space released its report on long-term goals for the U.S. civilian space program.

05/03/86 --- Delta launch vehicle exploded during launch.

04/18/86 --- Titan launch vehicle exploded during launch.

01/28/86 --- Space shuttle Challenger exploded 73 seconds after lift-off, killing all seven crew members.

01/25/84 --- In his State of the Union address, President Reagan called for the development of a permanently occupied space station within a decade.

11/11/82 --- First "operational" launch of the space shuttle.

04/12/81 --- First launch of the space shuttle.

07/20/69 --- First men landed on the Moon (Apollo 11), fulfilling President Kennedy's 1961 mandate.

05/25/61 --- President Kennedy called upon the Nation to commit to the goal of landing a man on the Moon by the end of the decade.

05/05/61 --- Alan Shepard became the first American to reach space, although his flight was suborbital.

04/12/61 --- Yuri Gagarin became the first human to orbit Earth.

10/01/58 --- The National Aeronautics and Space Administration was created.

10/04/57 --- World's first satellite, Sputnik 1, was launched by the Soviet Union.

FOR ADDITIONAL READING

U.S. Congressional Budget Office. Setting space transportation policy for the 1990s, by David H. Moore. Washington, 1986. 52 p.

U.S. Library of Congress. Congressional Research Service. ASATs: antisatellite weapon systems. [Washington] 1987. (Updated regularly)
CRS Issue Brief 85176

----- Analysis of the FY88 budget request for the National Aeronautics and Space Administration. [Washington] 1987.
CRS Report 87-892 SPR

----- Commonly used acronyms and program names in the space program. [Washington] 1987.
CRS Report 87-256 SPR

----- NASA's proposed postponement of the Mars observer mission. Feb. 6, 1987. [Washington] 1987. 4 p.
CRS Report 87-123 SPR

----- Space activities of the United States, Soviet Union, and other launching countries, 1957-1986, by Marcia Smith. Rev. Feb. 27, 1987.
CRS Report 87-229 SPR

----- Space activities of the non-launching countries, by Patricia Humphlett. Rev. Mar. 7, 1985. 98 p.
CRS Report 85-72 SPR

----- Space launch options after the shuttle accident, by Patricia Humphlett and Arthur F. Manfredi. Jan. 27, 1987. 11 p.
CRS Issue Brief 86121

----- Space stations, by Marcia S. Smith. [Washington] 1987. (Updated regularly)
CRS Issue Brief 85209

----- The strategic defense initiative: program description and major issues, by Cosmo DiMaggio, Arthur Manfredi, and Steven Hildreth. Jan. 7, 1986. 47 p.
CRS Report 86-8 SPR

----- The strategic defense initiative: program facts, by Steven Hildreth and Alice Maroni. [Washington] 1987. (Updated regularly)
CRS Issue Brief 85170

----- Strategic forces: miniature homing vehicle (MHV) and antisatellite (ASAT), weapons facts, by Arthur Manfredi. Jan. 20, 1987. 7 p.
CRS Issue Brief 86052

U.S. National Aeronautics and Space Administration. Aeronautics and space report of the President; annual report. Washington, U.S. Govt. Print. Off.

U.S. National Commission on Space. Pioneering the space frontier. New York, Bantam books, 1986. 213 p.

U.S. Office of Technology Assessment. Civilian space policy and applications. Washington, 1982. 391 p.

----- International cooperation and competition in civilian space activities. Washington, 1985. 472 p.

----- Civilian space stations and the U.S. future in space. Washington, 1984. 234 p.

U.S. Presidential Commission on the Space Shuttle Challenger Accident. Report. Washington, U.S. Govt. Print. Off., 1986. 256 p.