

Final Report to the President on the U.S. Space Program

- July 24, 1991 President announces NSPD 4, National Space Launch Strategy.
- September 30, 1991 *Report of the Earth Observing System (EOS) Engineering Review Committee*, prepared under the leadership of Edward Frieman, is released.
- February 13, 1992 President announces NSPD 5, Landsat Remote Sensing Strategy.
- March 13, 1992 President announces NSPD 6, Space Exploration Initiative Strategy.
- June 5, 1992 President announces NSPD 7, Space-based Global Change Observation System.
- June 17, 1992 President Bush and Russian President Yeltsin sign cooperation agreement which provides a framework for joint U.S./Russia cooperative projects.
- November 19, 1992 Vice President's Space Policy Advisory Board releases a report, prepared by a Task Group led by Daniel J. Fink, *The Future of the U.S. Space Industrial Base*.
- November 19, 1992 Vice President's Space Policy Advisory Board releases a report, prepared by a Task Group led by E. C. (Pete) Aldridge, Jr., *The Future of the U.S. Space Launch Capability*.
- January 4, 1993 Vice President's Space Policy Advisory Board releases a report, prepared by a Task Group led by Laurel Wilkening, *A Post Cold War Assessment of U.S. Space Policy*.

Appendix II

Executive Order Establishing the National Space Council

Executive Order 12675

April 20, 1989

Establishing the National Space Council

By the authority vested in me as President by the Constitution and laws of the United States of America, and in order to provide a coordinated process for developing a national space policy and strategy and for monitoring its implementation, it is hereby ordered as follows:

Section 1. Establishment and Composition of the National Space Council.

(a) There is established the National Space Council ("the Council").

(b) The Council shall be composed of the following members:

- (1) The Vice President, who shall be Chairman of the Council;
- (2) The Secretary of State;
- (3) The Secretary of the Treasury;
- (4) The Secretary of Defense;
- (5) The Secretary of Commerce;
- (6) The Secretary of Transportation;
- (7) The Director of the Office of Management and Budget;
- (8) The Chief of Staff to the President;
- (9) The Assistant to the President for National Security Affairs;
- (10) The Assistant to the President for Science and Technology;
- (11) The Director of Central Intelligence; and
- (12) The Administrator of the National Aeronautics and Space Administration.

(c) The Chairman shall, from time to time, invite the following to participate in meetings of the Council:

- (1) The Chairman of the Joint Chiefs of Staff; and
- (2) The heads of other executive departments and agencies and other senior officials in the Executive Office of the President.

Section 2. Functions of the Council.

(a) The Council shall advise and assist the President on national space policy and strategy, and perform such other duties as the President may from time to time prescribe.

(b) In addition, the Council is directed to:

- (1) review United States Government space policy, including long-range goals, and develop a strategy for national space activities;
- (2) develop recommendations for the President on space policy and space-related issues;

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- (3) monitor and coordinate implementation of the objectives of the President's national space policy by executive departments and agencies; and
 - (4) foster close coordination, cooperation, and technology and information exchange among the civil, national security, and commercial space sectors, and facilitate resolution of differences concerning major space and space-related policy issues.
- (c) The creation and operation of the Council shall not interfere with existing lines of authority and responsibilities in the departments and agencies.

Section 3. Responsibilities of the Chairman.

- (a) The Chairman shall serve as the President's principal advisor on national space policy and strategy.
- (b) The Chairman shall, in consultation with the members of the Council, establish procedures for the Council and establish the agenda for Council activities.
- (c) The Chairman shall report to the President on the activities and recommendations of the Council. The Chairman shall advise the Council as appropriate regarding the President's directions with respect to the Council's activities and national space policy generally.
- (d) The Chairman shall authorize the establishment of such committees of the Council, including an executive committee, and of such working groups, composed of senior designees of the Council members and of other officials invited to participate in Council meetings, as he deems necessary or appropriate for the efficient conduct of Council functions.

Section 4. National Space Policy Planning Process.

- (a) The Council will establish a process for developing and monitoring the implementation of national space policy and strategy.
- (b) To implement this process, each agency represented on the Council shall provide such information regarding its current and planned space activities as the Chairman shall request.
- (c) The head of each executive department and agency shall ensure that its space-related activities conform to national space policy and strategy.

Executive Order 12675

Section 5. Establishment of Vice President's Space Policy Advisory Board.

- (a) The Vice President shall establish, in accordance with the provisions of the Federal Advisory Committee Act, as amended (5 U.S.C. App. 2), governing presidential advisory committees, an advisory committee of private citizens to advise the Vice President on the space policy of the United States ("the Board").
- (b) The Board shall be composed and function as follows:
 - (1) The Board shall be composed of members appointed by the Vice President.
 - (2) The Vice President shall designate a Chairman from among the members of the Board. The Executive Secretary of the National Space Council shall serve as the Secretary to the Board.
 - (3) Members of the Board shall serve without any compensation for their work on the Board. However, they shall be entitled to travel expenses, including per diem in lieu of subsistence, as authorized by law, for persons serving intermittently in the Government service (5 U.S.C. 5701-5707), to the extent funds are available for that purpose.
 - (4) Necessary expenses of the Board shall be paid from funds available for the expenses of the National Space Council.
 - (5) Notwithstanding the provisions of any other Executive Order, the responsibilities of the President under the Federal Advisory Committee Act, as amended, except that of reporting annually to the Congress, which are applicable to the Board established by this order, shall be performed on a reimbursable basis by the Director of the Office of Administration in the Executive Office of the President, in accordance with the guidelines and procedures established by the Administrator of General Services.

Section 6. Microgravity Research Board.

Section 1(c) of Executive Order No. 12660 is amended by deleting "Economic Policy Council" and inserting in lieu thereof "National Space Council."

Section 7. Administrative Provisions.

- (a) The Office of Administration in the Executive Office of the President shall provide the Council with such administrative support on a reimbursable basis as may be necessary for the performance of the functions of the Council.

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- (b) The President shall appoint an Executive Secretary, who shall appoint such staff as may be necessary to assist in the performance of the Council's functions.
- (c) All Federal departments, agencies, and interagency councils and committees having an impact on space policy shall extend, as appropriate, such cooperation and assistance to the Council as is necessary to carry out its responsibilities under this order.
- (d) The head of each agency serving on the Council or represented on any working group or committee of the Council shall provide such administrative support as may be necessary, in accordance with law and subject to the availability of appropriations, to enable the agency head or its representative to carry out his responsibilities.

Section 8. Reports.

The Council shall submit an annual report setting forth its assessment of and recommendations for the space policy and strategy of the United States Government.

Appendix III

National Space Policy Directives

National Space Policy Directive 1

November 2, 1989

National Space Policy

Introduction

This document contains national policy, guidelines, and implementing actions with respect to the conduct of United States space programs and related activities.

United States space activities are conducted by three separate and distinct sectors: two strongly interacting governmental sectors (Civil and National Security) and a separate, nongovernmental Commercial Sector. Close coordination, cooperation, and technology and information exchange will be maintained among these sectors to avoid unnecessary duplication and promote attainment of United States space goals.

Goals and Principles

A fundamental objective guiding United States space activities has been, and continues to be, space leadership. Leadership in an increasingly competitive international environment does not require United States preeminence in all areas and disciplines of space enterprise. It does require United States preeminence in the key areas of space activity critical to achieving our national security, scientific, technical, economic, and foreign policy goals.

The overall goals of United States space activities are: (1) to strengthen the security of the United States; (2) to obtain scientific, technological, and economic benefits for the general population and to improve the quality of life on Earth through space-related activities; (3) to encourage continuing United States private-sector investment in space and related activities; (4) to promote international cooperative activities, taking into account United States national security, foreign policy, scientific, and economic interests; (5) to cooperate with other nations in maintaining the freedom of space for all activities that enhance the security and welfare of mankind; and, as a long-range goal, (6) to expand human presence and activity beyond Earth orbit into the solar system.

United States space activities shall be conducted in accordance with the following principles:

- The United States is committed to the exploration and use of outer space by all nations for peaceful purposes and for the benefit of all mankind. "Peaceful purposes" allow for activities in pursuit of national security goals.
- The United States will pursue activities in space in support of its inherent right of self-defense and its defense commitments to its allies.
- The United States rejects any claims to sovereignty by any nation over outer space or celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right of sovereign nations to acquire data from space.

- The United States considers the space systems of any nation to be national property with the right of passage through and operations in space without interference. Purposeful interference with space systems shall be viewed as an infringement on sovereign rights.
- The United States shall encourage and not preclude the commercial use and exploitation of space technologies and systems for national economic benefit. These commercial activities must be consistent with national security interests, and international and domestic legal obligations.
- The United States will, as a matter of policy, pursue its commercial space objectives without the use of direct Federal subsidies.
- The United States shall encourage other countries to engage in free and fair trade in commercial space goods and services.
- The United States will conduct international cooperative space-related activities that are expected to achieve sufficient scientific, political, economic, or national security benefits for the Nation. The United States will seek mutually beneficial international participation in space and space-related programs.

Civil Space Policy

The United States civil space sector activities shall contribute significantly to enhancing the Nation's science, technology, economy, pride, sense of well-being and direction, as well as United States world prestige and leadership. Civil sector activities shall comprise a balanced strategy of research, development, operations, and technology for science, exploration, and appropriate applications.

The objectives of the United States civil space activities shall be (1) to expand knowledge of the Earth, its environment, the solar system, and the universe; (2) to create new opportunities for use of the space environment through the conduct of appropriate research and experimentation in advanced technology and systems; (3) to develop space technology for civil applications and, wherever appropriate, make such technology available to the commercial sector; (4) to preserve the United States preeminence in critical aspects of space science, applications, technology, and manned space flight; (5) to establish a permanently manned presence in space; (6) to engage in international cooperative efforts that further United States overall space goals.

Commercial Space Policy

The United States Government shall not preclude or deter the continuing development of a separate nongovernmental Commercial Space Sector. Expanding private sector investment in space by the market-driven Commercial Sector generates economic benefits for the Nation and supports governmental Space Sectors with an increasing range of space goods and services. Governmental Space Sectors shall purchase commercially available space goods and services to the fullest extent feasible and shall not conduct activities with potential commercial applications that preclude or deter Commercial Sector space activities, except for national security or public safety reasons. Commercial Sector space activities shall be supervised or regulated only to the extent required by law, national security, international obligations, and public safety.

National Security Space Policy

The United States will conduct those activities in space that are necessary to national defense. Space activities will contribute to national security objectives by (1) deterring, or if necessary, defending against enemy attack; (2) assuring that forces of hostile nations cannot prevent our own use of space; (3) negating, if necessary, hostile space systems; and (4) enhancing operations of United States and allied forces. Consistent with treaty obligations, the national security space program shall support such functions as command and control, communications, navigation, environmental monitoring, warning, surveillance, and force application (including research and development of programs which support these functions).

Inter-Sector Policies

This section contains policies applicable to, and binding on, the National Security and Civil Space Sectors.

The United States Government will maintain and coordinate separate national security and civil operational space systems where differing needs of the sectors dictate.

Survivability and endurance of national security space systems, including all necessary system elements, will be pursued commensurate with the planned use in crisis and conflict, with the threat, and with the availability of other assets to perform the mission.

Government sectors shall encourage, to the maximum extent feasible, the development and use of United States private sector space capabilities.

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A continuing capability to remotely sense the Earth from space is important to the achievement of United States space goals. To ensure that the necessary capability exists, the United States Government will: (a) ensure the continuity of Landsat-type remote sensing data; (b) discuss remote sensing issues and activities with foreign governments operating or regulating the private operation of remote sensing systems; (c) continue government research and development for future advanced remote sensing technologies or systems; and (d) encourage the development of commercial systems, which image the Earth from space, competitive with, or superior to, foreign-operated civil or commercial systems.

Assured access to space, sufficient to achieve all United States space goals, is a key element of national space policy. United States space transportation systems must provide a balanced, robust, and flexible capability with sufficient resiliency to allow continued operations despite failures in any single system. The United States Government will continue research and development on component technologies in support of future transportation systems. The goals of United States space transportation policy are: (1) to achieve and maintain safe and reliable access to, transportation in, and return from, space; (2) to exploit the unique attributes of manned and unmanned launch and recovery systems; (3) to encourage, to the maximum extent feasible, the development and use of United States private sector space transportation capabilities; and (4) to reduce the costs of space transportation and related services.

Communications advancements are critical to all United States space sectors. To ensure necessary capabilities exist, the United States Government will continue research and development efforts for future advanced space communications technologies.

The United States will consider and, as appropriate, formulate policy positions on arms control measures governing activities in space, and will conclude agreements on such measures only if they are equitable, effectively verifiable, and enhance the security of the United States and our allies.

All space sectors will seek to minimize the creation of space debris. Design and operations of space tests, experiments, and systems will strive to minimize or reduce accumulation of space debris consistent with mission requirements and cost-effectiveness. The United States Government will encourage other spacefaring nations to adopt policies and practices aimed at debris minimization.

Implementing Procedures

Normal interagency procedures will be employed wherever possible to coordinate the policies enunciated in this directive.

Executive Order No. 12675 established the National Space Council to provide a coordinated process for developing a national space policy and strategy and for monitoring its implementation.

The Vice President serves as the Chairman of the Council, and as the President's principal advisor on national space policy and strategy. Other members of the Council are the Secretaries of State, Treasury, Defense, Commerce, and Transportation; the Chief of Staff to the President, the Director of the Office of Management and Budget, the Assistant to the President for National Security Affairs, the Assistant to the President for Science and Technology, the Director of Central Intelligence, and the Administrator of the National Aeronautics and Space Administration. The Chairman, from time to time, invites the Chairman of the Joint Chiefs of Staff, the heads of executive agencies, and other senior officials to participate in meetings of the Council.

Policy Guidelines and Implementing Actions

The following Policy Guidelines and Implementing Actions provide a framework through which the policies in this directive shall be carried out. Agencies will use these sections as guidance on priorities, including preparation, review, and execution of budgets for space activities, within the overall resource and policy guidance provided by the President. Affected Government agencies shall ensure that their current policies are consistent with this directive and, where necessary, shall establish policies to implement these practices.

Civil Space Sector Guidelines

Introduction. In conjunction with other agencies: NASA will continue the lead role within the Federal Government for advancing space science, exploration, and appropriate applications through the conduct of activities for research, technology, development, and related operations; National Oceanic and Atmospheric Administration will gather data, conduct research, and make predictions about the Earth's environment; DOT will license and promote commercial launch operations which support Civil Sector operations.

Space Science. NASA, with the collaboration of other appropriate agencies, will conduct a balanced program to support scientific research, exploration, and experimentation to expand understanding of: (1) astrophysical phenomena and the origin and evolution of the universe; (2) the Earth, its environment, and its dynamic relationship with the Sun; (3) the origin and evolution of the solar system; (4) fundamental physical, chemical, and biological processes; (5) the effects of the space environment on human beings; and (6) the factors governing the origin and spread of life in the universe.

Space Exploration. In order to investigate phenomena and objects both within and beyond the solar system, NASA will conduct a balanced program of manned and unmanned exploration.

- Human Exploration. To implement the long-range goal of expanding human presence and activity beyond Earth orbit into the solar system, NASA will continue the systematic development of technologies necessary to enable and support a range of future manned missions. This technology program (Pathfinder) will be oriented toward a Presidential Decision on a focused program of manned exploration of the solar system.
- Unmanned Exploration. NASA will continue to pursue a program of unmanned exploration where such exploration can most efficiently and effectively satisfy national space objectives by, among other things: achieving scientific objectives where human presence is undesirable or unnecessary; exploring realms where the risks or costs of life support are unacceptable; and providing data vital to support future manned missions.

Permanent Manned Presence. NASA will develop the Space Station to achieve permanently manned operational capability by the mid-1990s. Space Station Freedom will: (1) contribute to United States preeminence in critical aspects of manned spaceflight; (2) provide support and stability to scientific and technological investigations; (3) provide early benefits, particularly in the materials and life sciences; (4) promote private sector experimentation preparatory to independent commercial activity; (5) allow evolution in keeping with the needs of Station users and the long-term goals of the United States; (6) provide opportunities for Commercial Sector participation; and (7) contribute to the longer term goal of expanding human presence and activity beyond Earth orbit into the solar system.

Manned Spaceflight Preeminence. Approved programs, such as efforts to improve and safely operate the Space Transportation System (STS) and to develop, deploy, and use the Space Station, are intended to ensure United States preeminence in critical aspects of manned spaceflight.

Space Applications. NASA and other agencies will pursue the identification and development of appropriate applications flowing from their activities. Agencies will seek to promote private sector development and implementation of applications.

- Such applications will create new capabilities, or improve the quality or efficiency of continuing activities, including long-term scientific observations.
- NASA will seek to ensure its capability to conduct selected critical missions through an appropriate mix of assured access to space, on-orbit sparing, advanced automation techniques, redundancy, and other suitable measures.
- Agencies may enter cooperative research and development agreements on space applications with firms seeking to advance the relevant state of the art consistent with United States Government space objectives.

- Management of Federal civil operational remote sensing is the responsibility of the Department of Commerce. The Department of Commerce will: (a) consolidate Federal needs for civil operational remote sensing products to be met either by the private sector or by the Federal Government; (b) identify needed civil operational system research and development objectives; and (c) in coordination with other departments or agencies, provide for the regulation of private sector operational remote sensing systems.

Civil Government Space Transportation. The unique Space Transportation System (STS) capability to provide manned access to space will be exploited in those areas that offer the greatest national return, including contributing to U.S. preeminence in critical aspects of manned spaceflight. The STS fleet will maintain the Nation's capability and will be used to support critical programs requiring manned presence and other unique STS capabilities. In support of national space transportation goals, NASA will establish sustainable STS flight rates to provide for planning and budgeting of Government space programs. NASA will pursue appropriate enhancements to STS operational capabilities, upper stages, and systems for deploying, servicing, and retrieving spacecraft as national and user requirements are defined.

International Cooperation. The United States will foster increased international cooperation in civil space activities by seeking mutually beneficial international participation in civil space and space-related programs. The National Space Council shall be responsible for oversight of civil space cooperation with the Soviet Union. No such cooperative activity shall be initiated until an appropriate interagency review has been completed. U.S. cooperation in international civil space activities will:

- United States participation in international space ventures, whether public or private, must be consistent with U.S. technology transfer laws, regulations, Executive Orders, and Presidential Directives.
- Support the public, nondiscriminatory direct readout of data from Federal civil systems to foreign ground stations and the provision of data to foreign users under specified conditions.
- Be conducted in such a way as to protect the commercial value of intellectual property developed with Federal support. Such cooperation will not preclude or deter commercial space activities by the U.S. private sector, except as required by national security or public safety.

Commercial Space Sector Guidelines

NASA, and the Departments of Commerce, Defense, and Transportation, will work cooperatively to develop and implement specific measures to foster the growth of private sector commercial use

of space. A high-level focus for commercial space issues has been created through establishment of the National Space Council.

To stimulate private sector investment, ownership, and operation of space assets, the U.S. Government will facilitate private sector access to appropriate U.S. space-related hardware and facilities, and encourage the private sector to undertake commercial space ventures. Governmental Space Sectors shall:

- Utilize commercially available goods and services to the fullest extent feasible, and avoid actions that may preclude or deter commercial space sector activities, except as required by national security or public safety. A space good or service is "commercially available" if it is currently offered to a Government service procurement request. "Feasible" means that such goods or services meet mission requirements in a cost-effective manner.
- Enter into appropriate cooperative agreements to encourage and advance private sector basic research, development, and operations while protecting the commercial value of the intellectual property developed.
- Provide for the use of appropriate Government facilities on a reimbursable basis.
- Identify, and eliminate or propose for elimination, applicable portions of United States laws and regulations that unnecessarily impede Commercial Space Sector activities.
- Encourage free and fair trade in commercial space activities. Consistent with the goals, principles, and policies set forth in this directive, the United States Trade Representative will consult, or, as appropriate, negotiate with other countries to encourage free and fair trade in commercial space activities. In entering into space-related technology development and transfer agreements with other countries, executive departments and agencies will take into consideration whether such countries practice and encourage free and fair trade in commercial space activities.
- Provide for the timely transfer of Government-developed space technology to the private sector in such a manner as to protect its commercial value, consistent with national security.
- Price Government-provided goods and services consistent with OMB Circular A-25.

National Security Space Sector Guidelines

General:

- The Department of Defense (DoD) will develop, operate, and maintain an assured mission capability through an appropriate mix of robust satellite control, assured access to space, on-orbit sparing, proliferation, reconstitution, or other means.
- The national security space program, including dissemination of data, shall be conducted in accordance with Executive Orders and applicable directives for the protection of national security information and commensurate with both the missions performed and the security measures necessary to protect related space activities.
- DoD will ensure that the national security space program incorporates the support requirements of the Strategic Defense Initiative.

Space Support:

- The National Security Space Sector may use both manned and unmanned launch systems as determined by specific mission requirements. Payloads will be distributed among launch systems and launch sites to minimize the impact of loss of any single launch system or launch site on mission performance. The DoD will procure unmanned launch vehicles or services and maintain launch capability on both the East and West coasts. DoD will also continue to enhance the robustness of its satellite control capability through an appropriate mix of satellite autonomy and survivable command and control, processing, and data dissemination systems.
- DoD will study concepts and technologies which would support future contingency launch capabilities.

Force Enhancement:

- The National Security Space Sector will develop, operate, and maintain space systems and develop plans and architectures to meet the requirements of operational land, sea, and air forces through all levels of conflict commensurate with their intended use.

Space Control:

- The DoD will develop, operate, and maintain enduring space systems to ensure its freedom of action in space. This requires an integrated combination of antisatellite, survivability, and surveillance capabilities.
- Antisatellite (ASAT) Capability. The United States will develop and deploy a comprehensive capability with programs as required and with initial operational capability at the earliest possible date.
- DoD space programs will pursue a survivability enhancement program with long-term planning for future requirements. The DoD must provide for the survivability of selected, critical national security space assets (including associated terrestrial components) to a degree commensurate with the value and utility of the support they provide to national-level decision functions, and military operational forces across the spectrum of conflict.
- The United States will develop and maintain an integrated attack warning, notification, verification, and contingency reaction capability which can effectively detect and react to threats to United States space systems.

Force Application:

- The DoD will, consistent with treaty obligations, conduct research, development, and planning to be prepared to acquire and deploy space systems should national security conditions dictate.

Inter-Sector Guidelines:

The following paragraphs identify selected, high-priority cross-sector efforts and responsibilities to implement plans supporting major United States space policy objectives:

Space Transportation Guidelines:

- The United States national space transportation capability will be based on a mix of vehicles, consisting of the Space Transportation System (STS), unmanned launch vehicles (ULVs), and in-space transportation systems. The elements of this mix will be defined to support the mission needs of National Security and Civil Government Sectors of United States space activities in the most cost-effective manner.

- As determined by specific mission requirements, National Security Space Sector will use the STS and ULVs. In coordination with NASA, the DoD will assure the Shuttle's utility to national defense and will integrate missions into the Shuttle system. Launch priority will be provided for national security missions as implemented by NASA-DoD agreements. Launches necessary to preserve and protect human life in space shall have the highest priority except in times of national security emergency.
- The STS will continue to be managed and operated in an institutional arrangement consistent with the current NASA/DoD Memorandum of Understanding. Responsibility will remain in NASA for operational control of the STS for civil missions, and in the DoD for operational control of the STS for national security missions. Mission management is the responsibility of the mission agency.
- United States commercial launch operations are an integral element of a robust national space launch capability. NASA will not maintain an expendable launch vehicle (ELV) adjunct to the STS. NASA will provide launch services for commercial and foreign payloads only where those payloads must be man-tended, require the unique capabilities of the STS, or it is determined that launching the payloads on the STS is important for national security or foreign policy purposes. Commercial and foreign payloads will not be launched on Government-owned or -operated ELV systems except for national security or foreign policy reasons.
- Civil Government agencies will encourage, to the maximum extent feasible, a domestic commercial launch industry by contracting for necessary ELV launch services directly from the private sector or with DoD.
- NASA and the DoD will continue to cooperate in the development and use of military and civil space transportation systems and avoid unnecessary duplication of activities. They will pursue new launch and launch support concepts aimed at improving cost-effectiveness, responsiveness, capability, reliability, availability, maintainability, and flexibility. Such cooperation between the National Security and Civil Sectors will ensure efficient and effective use of national resources.

Guidelines for the Federal Encouragement of Commercial Unmanned Launch Vehicles (ULVs):

- The United States Government fully endorses and will facilitate the commercialization of United States unmanned launch vehicles (ULVs).
- The Department of Transportation (DOT) is the lead agency within the Federal Government for developing, coordinating, and articulating Federal policy and regulatory guidance pertaining to United States commercial launch activities in consultation with DoD, State, NASA, and other

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concerned agencies. All executive departments and agencies shall assist the DOT in carrying out its responsibilities, as set forth in the Commercial Space Launch Act and Executive Order 12465.

- The United States Government encourages the use of its launch and launch-related facilities for United States commercial launch operations.
- The United States Government will have priority use of Government facilities and support services to meet national security and critical mission requirements. The United States Government will make all reasonable efforts to minimize impacts on commercial operations.
- The United States Government will not subsidize the commercialization of ULVs, but will price the use of its facilities, equipment, and services with the goal of encouraging viable commercial ULV activities in accordance with the Commercial Space Launch Act.
- The United States Government will encourage free market competition within the United States private sector. The United States Government will provide equitable treatment for all commercial launch operators for the sale or lease of Government equipment and facilities consistent with its economic, foreign policy, and national security interests.
- NASA and DoD, for those unclassified and releasable capabilities for which they have responsibility, shall, to the maximum extent feasible:
 - Use best efforts to provide commercial launch firms with access, on a reimbursable basis, to national launch and launch-related facilities, equipment, tooling, and services to support commercial launch operations;
 - Develop, in consultation with the DOT, contractual arrangements covering access by commercial launch firms to national launch and launch-related property and services they request in support of their operations;
 - Provide technical advice and assistance to commercial launch firms on a reimbursable basis, consistent with the pricing guidelines herein; and
 - Conduct, in coordination with DOT, appropriate environmental analyses necessary to ensure that commercial launch operations conducted at Federal launch facilities are in compliance with the National Environmental Policy Act.

Government ULV Pricing Guidelines:

The price charged for the use of United States Government facilities, equipment, and service will be based on the following principles:

- Price all services (including those associated with production and launch of commercial ULVs) based on the direct costs incurred by the United States Government. Reimbursement shall be credited to the appropriation from which the cost of providing such property or service was paid.
- The United States Government will not seek to recover ULV design and development costs or investments associated with any existing facilities or new facilities required to meet United States Government needs to which the U.S. Government retains title.
- Tooling, equipment, and residual ULV hardware on hand at the completion of the United States Government's program will be priced on a basis that is in the best overall interest of the United States Government, taking into consideration that these sales will not constitute a subsidy to the private sector operator.

Commercial Launch Firm Requirements:

Commercial launch firms shall:

- Maintain all facilities and equipment leased from the United States Government to a level of readiness and repair specified by the United States Government.
- ULV operators shall comply with all requirements of the Commercial Space Launch Act, all regulations issued under the Act, and all terms, conditions, or restrictions of any license issued or transferred by the Secretary of Transportation under the Act.

Technology Transfer Guidelines:

- The United States will work to stem the flow of advanced Western space technology to unauthorized destinations. Executive departments and agencies will be fully responsible for protecting against adverse technology transfer in the conduct of their programs.
- Sales of United States space hardware, software, and related technologies for use in foreign space projects will be consistent with relevant international and bilateral agreements and arrangements.

Space Infrastructure

All Sectors shall recognize the importance of appropriate investments in the facilities and human resources necessary to support United States space objectives and maintain investments that are consistent with such objectives. The National Space Council will conduct a feasibility study of alternate methods for encouraging private sector investment, including capital funding, of United States space infrastructure such as ground facilities, launcher developments, and orbital assembly and test facilities.

- The primary forum for negotiations on nuclear and space arms is the Nuclear and Space Talks (NST) with the Soviet Union in Geneva. The instructions to the United States Delegation will be consistent with this National Space Policy Directive, established legal obligations, and additional guidance by the President. The United States will continue to consult with its allies on these negotiations and ensure that any resulting agreements enhance the security of the United States and its allies. Any discussions on arms control relating to activities in space in forums other than NST must be consistent with, and subordinate to, the foregoing activities and objectives.

National Space Policy Directive 2 September 5, 1990

Commercial Space Launch Policy

Policy Findings

A commercial space launch industry can provide many benefits to the U.S., including indirect benefits to U.S. national security.

The long-term goal of the United States is a free and fair market in which U.S. industry can compete. To achieve this, a set of coordinated actions is needed for dealing with international competition in launch goods and services in a manner that is consistent with our nonproliferation and technology transfer objectives. These actions must address both the short term (actions which will affect competitiveness over approximately the next ten years) and those which will have their principal effect in the longer term (i.e., after approximately the year 2000).

- In the near term, this includes trade agreements and enforcement of those agreements to limit unfair competition. It also includes the continued use of U.S.-manufactured launch vehicles for launching U.S. Government satellites.
- For the longer term, the United States should take actions to encourage technical improvements to reduce the cost and increase the reliability of U.S. space launch vehicles.

Implementing Actions

U.S. Government satellites will be launched on U.S.-manufactured launch vehicles unless specifically exempted by the President.

Consistent with guidelines to be developed by the National Space Council, U.S. Government agencies will actively consider commercial space launch needs and factor them into their decisions on improvements in launch infrastructure and launch vehicles aimed at reducing cost, and increasing responsiveness and reliability, of space launch vehicles.

The U.S. Government will enter into negotiations to achieve agreement with the European Space Agency (ESA), ESA member states, and others as appropriate, which defines principles of free and fair trade.

Nonmarket launch providers of space launch goods and services create a special case because of the absence of market-oriented pricing and cost structures. To deal with their entry into the market, there needs to be a transition period during which special conditions may be required.

There also must be an effective means of enforcing international agreements related to space launch goods and services.

National Space Policy Directive 3
February 12, 1991

U.S. Commercial Space Policy Guidelines

A fundamental objective guiding United States space activities has been space leadership, which requires preeminence in key areas of space activity. In an increasingly competitive international environment, the U.S. Government encourages the commercial use and exploitation of space technologies and systems for national economic benefit. These efforts to encourage commercial activities must be consistent with national security and foreign policy interests; international and domestic legal obligations, including U.S. commitments to stem missile proliferation; and agency mission requirements.

United States space activities are conducted by three separate and distinct sectors: two U.S. Government sectors — the civil and national security — and a nongovernmental commercial space sector. The commercial space sector includes a broad cross section of potential providers and users, including both established and new market participants. There also has been a recent emergence of State government initiatives related to encouraging commercial space activities. The commercial space sector is comprised of at least five market areas, each encompassing both Earth- and space-based activities, with varying degrees of market maturity or potential:

Satellite Communications - the private development, manufacture, and operation of communications satellites and marketing of satellite telecommunications services, including position location and navigation;

Launch and Vehicle Services - the private development, manufacture, and operation of launch and reentry vehicles, and the marketing of space transportation services;

Remote Sensing - the private development, manufacture, and operation of remote sensing satellites and the processing and marketing of remote sensing data;

Materials Processing - the experimentation with, and production of, organic and inorganic materials and products utilizing the space environment; and

Commercial Infrastructure - the private development and provision of space-related support facilities, capabilities, and services.

In addition, other market-driven commercial space sector opportunities are emerging.

The U.S. Government encourages private investment in, and broader responsibility for, space-related activities that can result in products and services that meet the needs of Government and other customers in a competitive market. As a matter of policy, the U.S. Government pursues its commercial space objectives without the use of direct Federal subsidies. A robust commercial space sector has the potential to generate new technologies, products, markets, jobs, and other economic benefits for the Nation, as well as indirect benefits for national security.

Commercial space sector activities are characterized by the provision of products and services such that:

- private capital is at risk;
- there are existing, or potential, nongovernmental customers for the activity;
- the commercial market ultimately determines the viability of the activity; and
- primary responsibility and management initiative for the activity resides with the private sector.

Implementing Guidelines

The following implementing guidelines shall serve to provide the U.S. private sector with a level of stability and predictability in its dealings with agencies of the U.S. Government. The agencies will work separately but cooperatively, as appropriate, to develop specific measures to implement this strategy. U.S. Government agencies shall, consistent with national security and foreign policy interests, international and domestic legal obligations, and agency mission requirements, encourage the growth of the U.S. commercial space sector in accordance with the following guidelines:

- U.S. Government agencies shall utilize commercially available space products and services to the fullest extent feasible. This policy of encouraging U.S. Government agencies to purchase, and the private sector to sell, commercial space products and services has potentially large economic benefits.
 - A space product or service is “commercially available” if it is currently offered commercially, or if it could be supplied commercially in response to a Government procurement request.
 - “Feasible” means that products and services meet mission requirements in a cost-effective manner.
 - “Cost-effective” generally means that the commercial product or service costs no more than governmental development or directed procurement where such Government costs include applicable Government labor and overhead costs, as well as contractor charges and operations costs.
 - However, the acquisition of commercial space products and services shall generally be considered cost effective if they are procured competitively using performance-based contracting techniques. Such contracting techniques give contractors the freedom and financial incentive to achieve economies of scale by combining their Government and commercial work, as well as increased productivity through innovation.

- U.S. Government agencies shall actively consider, at the earliest appropriate time, the feasibility of their using commercially available products and services in agency programs and activities.
- U.S. Government agencies shall continue to take appropriate measures to protect from disclosure any proprietary data which is shared with the U.S. Government in the acquisition of commercial space products and services.
- U.S. Government agencies shall promote the transfer of U.S. Government-developed technology to the private sector.
 - U.S. Government-developed unclassified space technology will be transferred to the U.S. commercial space sector in as timely a manner as possible and in ways that protect its commercial value.
 - U.S. Government agencies may undertake cooperative research and development activities with the private sector, as well as State and local governments, consistent with policies and funding, in order to fulfill mission requirements in a manner which encourages the creation of commercial opportunities.
 - With respect to technologies generated in the performance of Government contracts, U.S. Government agencies shall obtain only those rights necessary to meet Government needs and mission requirements, as directed by Executive Order 12591.
- U.S. Government agencies may make unused capacity of space assets, services, and infrastructure available for commercial space sector use.
 - Private sector use of U.S. Government agency space assets, services, and infrastructure shall be made available on a reimbursable basis consistent with OMB Circular A-25 or appropriate legislation.
- U.S. Government agencies may make available to the private sector those assets which have been determined to be excess to the requirements of the U.S. Government in accordance with U.S. law and applicable international treaty obligations. Due regard shall be given to the economic impact such transfer may have on the commercial space sector, promoting competition, and the long-term public interest.
- The U.S. Government shall avoid regulating domestic space activities in a manner that precludes or deters commercial space sector activities, except to the extent necessary to meet international and domestic legal obligations, including those of the Missile Technology Control Regime.

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Accordingly, agencies shall identify, and propose for revision or elimination, applicable portions of U.S. laws and regulations that unnecessarily impede commercial space sector activities.

- U.S. Government agencies shall work with the commercial space sector to promote the establishment of technical standards for commercial space products and services.
- U.S. Government agencies shall enter into appropriate cooperative agreements to encourage and advance private sector basic research, development, and operations. Agencies may reduce initial private sector risk by agreeing to future use of privately supplied space products and services where appropriate.
 - “Anchor tenancy” is an example of such an arrangement, whereby U.S. Government agencies can provide initial support to a venture by contracting for enough of the future product or service to make the venture viable in the short term. Long-term viability and growth must come primarily from the sale of the product or service to customers outside the U.S. Government.
 - There must be demonstrable U.S. Government mission or program requirements for the proposed commercial space good or service. In assessing the U.S. Government’s mission or program requirements for these purposes, the procuring agency may consider consolidating all anticipated U.S. Government needs for the particular product or service, to the maximum extent feasible.
 - U.S. Government agencies entering into such arrangements may take action, consistent with current policies and funding availability, to provide compensation to commercial space providers for future termination of missions for which the products or services were required.
- The United States will work toward establishment of an international trading environment that encourages market-oriented competition by working with its trading partners to:
 - Establish clear principles for international space markets that provide an atmosphere favorable to stimulating greater private investment and market development;
 - Eliminate direct Government subsidies and other unfair practices that undermine normal market competition among commercial firms;
 - Eliminate unfair competition by governments for business in space markets consistent with domestic policies that preclude or deter U.S. Government competition with commercial space sector activities.

The U.S. Commercial Space Policy Guidelines are consistent with the National Space Policy and the U.S. Commercial Space Launch Policy, which remain fully applicable to activities of the governmental space sectors and the commercial space sector.

Reporting Requirements

U.S. Government agencies affected by these guidelines are directed to report by October 1, 1991, to the National Space Council on their activities related to the implementation of these policy guidelines.

National Space Policy Directive 4
July 24, 1991

National Space Launch Strategy

Introduction

National space policy provides a framework within which agencies plan and conduct U.S. Government space activities. The National Space Launch Strategy provides guidance for implementation of that policy with respect to access to and from space.

Assured access to space is a key element of U.S. national space policy and a foundation upon which U.S. civil, national security, and commercial space activities depend.

United States space launch infrastructure, including launch vehicles and supporting facilities, should: (1) provide safe and reliable access to, transportation in, and return from space; (2) reduce the costs of space transportation and related services, thus encouraging expanded space activities; (3) exploit the unique attributes of manned and unmanned launch and recovery systems; and (4) encourage, to the maximum extent feasible, the development and growth of U.S. private sector space transportation capabilities which can compete internationally.

Space Launch Strategy

The National Space Launch Strategy is composed of four elements:

- (1) Ensuring that existing space launch capabilities, including support facilities, are sufficient to meet U.S. Government manned and unmanned space launch needs.
- (2) Developing a new unmanned, but man-rateable, space launch system to greatly improve national launch capability with reductions in operating costs and improvements in launch system reliability, responsiveness, and mission performance.
- (3) Sustaining a vigorous space launch technology program to provide cost-effective improvements to current launch systems, and to support development of advanced launch capabilities, complementary to the new launch system.
- (4) Actively considering commercial space launch needs and factoring them into decisions on improvements in launch facilities and launch vehicles.

These strategy elements will be implemented within the overall resource and policy guidance provided by the President.

Strategy Guidelines

Existing Space Launch Capability

- (1) A mixed fleet comprised of the Space Shuttle and existing expendable launch vehicles will be the primary U.S. Government means to transport people and cargo to and from space through the current decade and will be important components of the Nation's launch capability well into the first decade of the 21st century.
- (2) To meet U.S. Government needs, agencies will conduct programs to systematically maintain and improve the Space Shuttle, current U.S. expendable launch vehicle fleets, and supporting launch site facilities and range capabilities. Such programs shall be cost-effective relative to current and programmed mission needs and to investments in new launch capabilities.
- (3) As the Nation is moving toward development of a new space launch system, the production of additional Space Shuttle orbiters is not planned. The production of spare parts should continue in the near term to support the existing Shuttle fleet, and to preserve an option to acquire a replacement orbiter in the event of an orbiter loss or other demonstrable need. By continuing to operate the Shuttle conservatively, by taking steps to increase the reliability and lifetime of existing orbiters, and by developing a new launch system, the operational life of the existing orbiter fleet will be extended. The Space Shuttle will be used only for those important missions that require manned presence or other unique Shuttle capabilities, or for which use of the Shuttle is determined to be important for national security, foreign policy, or other compelling purposes.
- (4) Consistent with U.S. national security and national space policy, the U.S. Government may seek to recover residual value from ballistic missiles which are, or subsequently become, surplus to the needs of the Department of Defense. Prior to any release of such missiles, including components, beyond those already approved for use as space launch vehicles, the Department of Defense will conduct, and the National Space Council and the National Security Council will review, an assessment of alternative disposition options for such missiles.

Disposition options will be evaluated in terms of their consistency with U.S. national security and foreign policy interests, available agency resources, defense industrial base considerations, and with due regard to economic impact on the commercial space sector, promoting competition, and the long-term public interest.

New Space Launch System

- (1) The Department of Defense and the National Aeronautics and Space Administration will undertake the joint development of a new space launch system to meet civil and national security needs. The goal of this launch program is to greatly improve national launch capability with reductions in operating costs and improvements in launch system reliability, responsiveness, and mission performance.
- (2) The new launch system, including manufacturing processes and production and launch facilities, will be designed to support a range of medium- to heavy-lift performance requirements and to facilitate evolutionary change as requirements evolve. The design may take advantage of existing components from both the Space Shuttle and existing expendable rockets in order to expedite initial capability and reduce development costs. While initially unmanned, the new launch system will be designed to be man-rateable in the future.
- (3) The new launch system will be managed, funded, and developed jointly by the Department of Defense and the National Aeronautics and Space Administration. The development program will be structured in the near term toward the goal of a first flight in 1999. However, the program should allow for several schedule options for the first flight and should identify key intermediate milestones. Since the new launch system will provide the opportunity for significant long-term benefits to the commercial space launch industry, the agencies should actively explore the potential for U.S. private sector participation. Final decisions on the program schedule, including the date of the first flight, will be made during fiscal year 1993, based on updated requirements and technical and budgetary considerations at that time. A joint program plan will be prepared by the Department of Defense and the National Aeronautics and Space Administration and reviewed by the National Space Council.
- (4) The Department of Defense and the National Aeronautics and Space Administration will plan for the transition of selected space programs from current launch systems to the new launch system at appropriate program milestones to insure mission continuity and to minimize satellite and other transition costs.

Space Launch Technology

- (1) In addition to conducting the focused development program for a new launch system, appropriate U.S. Government agencies will continue to conduct broadly based research and focused technology programs to support long-term improvements in national space launch capabilities. This technology effort shall address launch system components (e.g., engines, materials, structures, avionics); upper stages; improved launch processing concepts; advanced

launch system concepts (e.g., single-stage-to-orbit concepts, including the National AeroSpace Plane); and experimental flight vehicle programs.

- (2) The Department of Defense, the Department of Energy, and the National Aeronautics and Space Administration will coordinate space launch technology efforts and, by December 1, 1991, jointly prepare a 10-year space launch technology plan.

Commercial Space Launch Considerations

- (1) In addition to addressing Government needs, improvement of space launch capabilities can facilitate the ability of the U.S. commercial space launch industry to compete. Consistent with U.S. space policy, U.S. Government agencies will actively consider commercial space launch needs and factor them into decisions on existing space launch capabilities, development of a new space launch system, and implementation of space launch technology programs in the following ways:
 - (a) U.S. Government-funded investments will be consistent with approved budgets and U.S. Government requirements.
 - (b) U.S. Government agencies, in acquiring space launch-related capabilities, should:
 - [1] Allow contractors, to the fullest extent feasible, the flexibility to accommodate commercial needs when developing launch vehicles and infrastructure to meet Government needs.
 - [2] Emphasize procurement strategies which are based on: "best value" rather than lowest cost, performance-based functional requirements, commercial production and quality-assurance standards and techniques, and the use of commercially offered space products and services.
 - [3] Encourage commercial and State and local government investment and participation in the development and improvement of U.S. launch systems and facilities.
 - [4] Provide for private sector retention of technical data rights, except those rights necessary to meet Government needs or to comply with statutory responsibilities.
 - (c) U.S. Government agencies should seek to remove, where appropriate, legal or administrative impediments to private sector arrangements such as industry teams, consortia, cost-sharing, and joint production agreements which may benefit U.S.

Government needs and economic competitiveness. Agencies should also seek legislative authority for stable long-term commitments to purchase space transportation services.

- (d) Within applicable law, U.S. Government agencies are encouraged to use industry advisory groups to facilitate the identification of commercial space launch needs and the elimination of barriers that unnecessarily impede commercial space launch activities. U.S. agencies are also encouraged to consult with State and local governments.
- (2) U.S. Government agencies should develop explicit provisions to implement these guidelines for actively considering commercial space launch needs. As appropriate, agencies should solicit public views on these provisions.

Reporting Requirements

U.S. Government agencies affected by these strategy guidelines are directed to report by December 1, 1991, to the National Space Council on their activities related to the implementation of these policies.

National Space Policy Directive 5
February 13, 1992

Landsat Remote Sensing Strategy

Policy Goals

A remote sensing capability such as is currently being provided by Landsat satellites 4 and 5 benefits the civil and national security interests of the United States and makes contributions to the private sector which are in the public interest. For these reasons, the United States Government will seek to maintain continuity of Landsat-type data. The U.S. Government will:

- a. Provide data which are sufficiently consistent in terms of acquisition geometry, coverage characteristics, and spectral characteristics with previous Landsat data to allow comparisons for change detection and characterization;
- b. Make Landsat data available to meet the needs of national security, global change research, and other Federal users; and,
- c. Promote and not preclude private sector commercial opportunities in Landsat-type remote sensing.

Landsat Strategy

The Landsat strategy is composed of the following elements:

- (1) Ensuring that Landsat satellites 4 and 5 continue to provide data as long as they are technically capable of doing so, or until Landsat 6 becomes operational.
- (2) Acquiring a Landsat 7 satellite with the goal of maintaining continuity of Landsat-type data beyond the projected Landsat 6 end of life.
- (3) Fostering the development of advanced remote sensing technologies, with the goal of reducing the cost and increasing the performance of future Landsat-type satellites to meet U.S. Government needs, and potentially, enabling substantially greater opportunities for commercialization.
- (4) Seeking to minimize the cost of Landsat-type data for U.S. Government agencies and to provide data for use in global change research in a manner consistent with the Administration's Data Management for Global Change Research Policy Statements.
- (5) Limiting U.S. Government regulations affecting private sector remote sensing activities to only those required in the interest of national security, foreign policy, and public safety.
- (6) Maintaining an archive, within the United States, of existing and future Landsat-type data.
- (7) Considering alternatives for maintaining continuity of data beyond Landsat 7.

These strategy elements will be implemented within the overall resource and policy guidance provided by the President.

Implementing Guidelines

The Department of Commerce will:

- (1) Complete and launch Landsat 6.
- (2) In coordination with OMB, arrange for the continued operation of Landsat satellites 4 and 5 until Landsat 6 becomes operational.

The Department of Defense and the National Aeronautics and Space Administration will:

- (1) Develop and launch a Landsat 7 satellite of at least equivalent performance to replace Landsat 6 and define alternatives for maintaining data continuity beyond Landsat 7.
- (2) Prepare a plan by March 1, 1992, which addresses management and funding responsibilities, operations, data archiving and dissemination, and commercial considerations associated with the Landsat program. This plan will be coordinated with other U.S. Government agencies, as appropriate, and reviewed by the National Space Council.
- (3) With the support of the Department of Energy and other appropriate agencies, prepare a coordinated technology plan that has as its goals improving the performance and reducing the cost for future Landsat-type remote sensing systems.

The Department of the Interior will continue to maintain a national archive of Landsat-type remote sensing data.

Affected agencies will identify funds, within their approved fiscal year 1993 budget, necessary to implement this strategy.

Reporting Requirements

U.S. Government agencies affected by these strategy guidelines are directed to report by March 15, 1992, to the National Space Council on the implementation of this strategy.

National Space Policy Directive 6

March 13, 1992

Space Exploration Initiative Strategy

Introduction

The Space Exploration Initiative Strategy approves the next in a series of steps to be taken by the National Aeronautics and Space Administration (NASA), the Department of Defense (DoD), the Department of Energy (DOE), and other Federal agencies regarding the planning for, and conduct of, the Nation's Space Exploration Initiative (SEI), which includes both Lunar and Mars elements, manned and robotic missions, and supporting technology. This series of steps augments previous Presidential Directives and recognizes the recommendations of both the Advisory Committee on the Future of the U.S. Space Program and the SEI Synthesis Group. The exploration of space is one of the fundamental goals of the U.S. civil space program. The SEI objectives, which build upon previous accomplishments, as well as upon existing programs, include a return to the Moon — this time to stay — and human expeditions to Mars. In addition, the objectives will provide a strategic framework for the conduct of the U.S. civil space program and will help focus investments in many areas of goal-oriented research and development by government, industry, and academia. Consistent with the Commercial Space Policy this framework is also intended to encourage private sector activities which augment or support the SEI objectives.

NASA is the principal implementing agency for the SEI. DoD and DOE, as participating agencies, will have major roles in support of the SEI in the conduct of technology development and concept definition. Other U.S. Government agencies are encouraged to participate by developing activities supportive of the SEI.

Exploration Responsibilities and Actions

To establish a firm foundation and clear direction for the SEI, the following actions shall be undertaken immediately:

a. NASA shall establish an exploration office headed by the Associate Administrator for Exploration and staffed by NASA and representatives from other participating agencies. The Associate Administrator shall be responsible for architecture and mission studies, planning, and program execution, as well as the definition of resulting requirements for research, technology, infrastructure, mission elements, and program implementation. As director of the exploration office, the Associate Administrator shall prepare an annual status report. The NASA Administrator shall present this report to the National Space Council.

b. Working with participating agencies, NASA's Associate Administrator for Exploration shall develop a strategic plan for the SEI to establish the basis for integrating existing and future SEI-related activities. This plan shall address research, technology development, and operations and identify the relationships between the SEI mission elements and the U.S. space infrastructure.

c. A Steering Committee for Space Exploration shall be established, chaired by NASA's Associate Administrator for Exploration, and shall include representation from participating agencies. The

Committee shall be the senior interagency forum for coordinating organizational interfaces, reports, plans and activities, and SEI-related programs and budgets, and for identifying those issues requiring consideration by the National Space Council. The Department of State shall participate in any meetings of the Committee related to international cooperation or other international activity.

Exploration Guidelines

To insure that necessary preparatory activities are accomplished, the following steps shall be taken:

a. The participating agencies shall address critical, long-lead research and technology development activities which are supportive of the exploration strategic plan.

b. The Department of Commerce and other appropriate agencies shall encourage the development of SEI-related proposals which foster private sector investments, ownership, and operation of space-related projects and ventures, as well as promote U.S. economic competitiveness. These agencies shall seek increased cooperation with the private sector through mechanisms such as technology transfer agreements, cooperative research and development agreements, and consortia, as appropriate.

c. Exploration requirements shall be incorporated into the evolutionary plans for the new national launch system.

d. NASA, DoD, and DOE shall continue technology development for space nuclear power and propulsion while ensuring that these activities are performed in a safe and environmentally acceptable manner and consistent with existing laws and regulations, treaty obligations, and agency mission requirements.

e. NASA and appropriate participating agencies shall implement a definitive life science program in support of the human exploration of the Moon and Mars.

f. All participating agencies should include space exploration in their respective educational programs. In addition, participating agencies shall take advantage of university research capabilities and cooperative education programs in SEI-related activities.

g. International cooperation in this endeavor is feasible and could offer significant benefits to the United States, subject to the satisfaction of national security, foreign policy, scientific, and economic interests.

h. Expanding on individual agency efforts to improve and streamline acquisition procedures, the Associate Administrator for Exploration, and participating agencies, shall work with the Office of Management and Budget and the Office of Federal Procurement Policy to develop improved U.S. Government procurement practices available for SEI acquisition.

i. The exploration office shall seek innovative ideas by encouraging input from all sectors of American society.

Reporting Requirements

a. By November 1992, the first annual status report shall be presented to the National Space Council. It shall address options for exploration architectures and initial capabilities.

b. The initial version of the Strategic Plan for the Space Exploration Initiative shall be presented to the National Space Council by April 1992, and updated regularly thereafter. The initial version shall focus on technology development and alternate mission architectures.

National Space Policy Directive 7

June 5, 1992

Space-based Global Change Observation

Introduction

The U.S. Global Change Research Program (USGCRP) is a key component of the Nation's overall approach to global stewardship and is one of the Nation's highest priority science programs. This program's goal is to provide a sound scientific basis for developing national and international policy relating to natural and human-induced changes in the Earth system. The ultimate success of the USGCRP depends upon an integrated set of ground- and space-based observation and research programs. The United States is planning and implementing a series of satellite missions that include NASA's Mission to Planet Earth, related environmental satellites, and activities of other agencies to provide these global observations for the next several decades. For the purposes of this document, these systems are collectively referred to as the Space-based Global Change Observation System (S-GCOS).

Objectives

a. General

The Space-based Global Change Observation System will provide space-based global observations which, together with other observations and studies, coordinated through the U.S. Global Change Research Program, will provide the scientific information to help understand the Earth system.

b. Specific

In support of the USGCRP, the S-GCOS shall:

1. Improve our ability to detect and document changes in the global climate system to determine, as soon as possible, whether there is global warming or other potentially adverse global environmental changes; and, if changes are detected, determine the magnitude of these changes and identify their causes.
2. Provide data to help identify and understand the complex interactions that characterize the Earth system in order to anticipate changes and differentiate between human-induced and natural processes.
3. Provide for a data system to manage the information collected by S-GCOS as an integral part of the Global Change Data and Information System, consistent with the USGCRP data policy.
4. Provide for the development and demonstration of new space-based remote sensing technologies for global change observation and identify candidate technologies for future operational use.

Implementing Actions

This directive provides guidance to agencies developing, deploying, operating, or supporting S-GCOS elements to acquire and manage relevant observations and data sets for the USGCRP.

a. International Cooperation

It is recognized that the goals and objectives of the U.S. Global Change Research Program can best be achieved through the mutually reinforcing research of all nations and many organizations and programs, which require a large measure of bilateral and multilateral cooperation. Accordingly, participating agencies may explore, in accordance with this directive and established procedures, international cooperation in space-based global change observation.

b. Interagency Coordination

Space-based Global Change Observation System activities are conducted in the context of the USGCRP. The Federal Coordinating Council on Science, Engineering, and Technology (FCCSET), through its Committee on Earth and Environmental Sciences (CEES), is responsible for developing and coordinating the USGCRP, and for the activities and requirements of the USGCRP and, therefore, for the Space-based Global Change Observation System. All S-GCOS agencies shall participate with other USGCRP agencies and the CEES in the development and coordination of the Space-based Global Change Observation System Program Plan. The provision, management, and exchange of data will be a key element of the USGCRP.

The CEES will coordinate the interagency development of the Global Change Data and Information System (GCDIS), which integrates appropriate observations, regardless of platform basing mode or orientation of data (land, oceanographic, atmospheric, or space). All agencies involved with S-GCOS will participate with other USGCRP agencies in planning for the GCDIS, with a goal of maximizing the system's interoperability. Data sets intended for the GCDIS shall be responsive to the requirements of, and be accessible to, global change scientists and U.S. Government-authorized research and operational users.

c. National Aeronautics and Space Administration (NASA)

The National Aeronautics and Space Administration is the lead agency for planning Space-based Global Change Observation System activities, and is responsible for developing and operating the NASA component of the S-GCOS. This component shall be developed to provide maximum program flexibility within budget constraints. As part of the USGCRP, NASA shall:

1. Lead the development and preparation of a coordinated interagency Space-based Global Change Observation System Program Plan, to be delivered to the National Space Council (NSpC),

National Security Council (NSC), the Office of Science and Technology Policy (OSTP), and the Office of Management and Budget (OMB) by the CEES through FCCSET. This plan will guide agencies' S-GCOS activities.

2. Continue with the Mission to Planet Earth by conducting the ongoing development, operation, and scientific use of instruments and satellites designed to observe and monitor processes that govern key aspects of global environmental change.

3. As part of the Mission to Planet Earth, develop the Earth Observing System (EOS), comprised of intermediate and small sized satellites as recommended by the EOS Engineering Review Panel.

4. Plan and develop, in an incremental and evolutionary manner, the EOS Data and Information System (EOSDIS), which is the NASA part of the data and information system for S-GCOS. This data and information system shall be compatible with other parts of the USGCRP Global Change Data and Information System, and able to incorporate, as appropriate, currently available Earth observations, such as those from Landsat, and provide an active archive for S-GCOS system data sets. Prototype versions of this system, using existing Earth observations, shall be constructed to demonstrate system utility and functions.

5. Develop new instruments and space systems for global change monitoring, utilizing technologies from NASA and other S-GCOS agencies. A plan for related NASA research and development activity shall be integral to the interagency-coordinated Space-based Global Change Observation System Program Plan.

d. Department of Energy (DOE)

The Department of Energy shall participate with NASA and the other appropriate S-GCOS agencies in developing satellite systems to maintain data continuity for the understanding of the Earth's radiation budget, starting in 1995, consistent with the Space-based Global Change Observation System Program Plan.

The DOE shall participate with other S-GCOS agencies in conducting research and development for advanced technologies that can offer promise of increased performance and/or lower cost for advanced long-term global change monitoring systems. A plan for related DOE research and development activity shall be integral to the interagency-coordinated Space-based Global Change Observation System Program Plan.

e. Department of Defense (DoD)

The participation of the Department of Defense in the Space-based Global Change Observation System shall consist of related activities derived from current and planned DoD programs. DoD, in cooperation with the Director of Central Intelligence, as appropriate, will identify those technologies and programs that support the S-GCOS and shall seek to make appropriate technology and data from those programs available. DoD may also seek to identify and take advantage of S-GCOS programs and capabilities, as appropriate.

f. Department of Commerce (DOC)

The Department of Commerce, through the National Oceanic and Atmospheric Administration (NOAA), shall participate in the collection, processing, archiving, retrieval, and use of oceanic- and atmospheric-oriented data and shall, consistent with the Space-based Global Change Observation System Program Plan, provide for the permanent archiving, management, access, and distribution of oceanic and atmospheric Earth science data sets for global change research, including data sets obtained by the S-GCOS. DOC/NOAA shall work with other appropriate agencies to transition, as appropriate, systems, technology, and/or sensors developed for use in the S-GCOS to operational use. The Space-based Global Change Observation System Program Plan shall include a discussion of the criteria related to the desirability and economic feasibility of transitioning specific S-GCOS assets to operational use.

g. Department of the Interior

The Department of the Interior shall assist in the collection, processing, archiving, retrieval, and use of land-oriented data and shall, consistent with the Space-based Global Change Observation System Program Plan, provide for the permanent archiving, management, access, and distribution of land-oriented Earth science data sets for global change research, including data sets obtained by S-GCOS.

h. Department of State

The Department of State has a role in Space-based Global Change Observation with respect to international agreements, significant activities, or arrangements with foreign countries, international organizations, or commissions where the United States and one or more foreign countries are members. Prior to discussions between participating agencies and foreign entities that could reasonably be expected to lead to such agreements, activities, or arrangements, the Department of State shall be consulted and, as appropriate, shall coordinate interagency review of the proposed U.S. position to ensure consistency with U.S. foreign policy, national security, and economic interests, and satisfaction of applicable legal requirements. This shall not affect the ability of participating agencies

to explore, in accordance with established procedures, scientific, technical, and programmatic aspects of proposed international cooperation that do not involve commitments or foreign policy concerns.

Reporting Requirements

a. NASA shall lead the preparation of a coordinated and integrated interagency Space-based Global Change Observation System Program Plan that shall be forwarded by the CEES through FCCSET to the NSpC, NSC, OSTP, and OMB not later than July 1, 1992. This plan shall address the S-GCOS architecture, existing and planned S-GCOS satellite systems, technology development activities, sensor suites, launch systems, supporting agency contributions, and the data and information systems.

b. Each March, FCCSET/CEES shall prepare and forward a Space-based Global Change Observation System Program Report on the progress and accomplishments of the S-GCOS to the NSpC, NSC, OSTP, and OMB. The Space-based Global Change Observation System Program Plan will meet this requirement for 1992.