

Appropriation Summary: Exploration Capabilities

Millions of Dollars	FY 2004 9/28/04 Operating Plan	FY 2005 12/23/05 Operating Plan	FY 2006 Budget Request
<u>SPACE OPERATIONS</u>	<u>5,890.1</u>	<u>6,830.4</u>	<u>6,763.0</u>
International Space Station	1,363.7	1,676.3	1,856.7
Space Shuttle	4,060.9	4,669.0	4,530.6
Space and Flight Support	465.5	485.1	375.6
<u>TOTAL APPROPRIATION</u>	<u>5,890.1</u>	<u>6,830.4</u>	<u>6,763.0</u>



Astronauts Michael E. Lopez-Alegria and John B. Herrington work on the newly installed Port One truss on the International Space Station (ISS) during the STS-113 mission. The spacewalk lasted 6 hours, 10 minutes. The end effector of the Canadarm2 / Space Station Remote Manipulator System and Earth's horizon are visible in bottom of frame.

Themes

International Space Station

Space Shuttle

Space and Flight Support

SPACE OPERATIONS

Purpose

The Space Operations Mission Directorate (SOMD) programs ensure that the Nation will have reliable, safe, and affordable access to space for NASA's human and robotic explorers and open new exploration and research opportunities through the extension of human presence in Space. The SOMD enables NASA to achieve its goals by providing transportation systems such as the Space Shuttle, operational research facilities in space such as the International Space Station (ISS); and space communications systems and supporting space infrastructure. The SOMD also provides the unique system--the human system--necessary to open the space frontier to the broadest extent possible.

FY 2004 Accomplishments

The SOMD entered FY 2004 with an evolving Shuttle Return to Flight (RTF) plan and the objective of resuming the assembly of the International Space Station (ISS) before the end of the following year. RTF efforts rapidly progressed from planning to hardware redesign, then to delivery of upgraded and new flight hardware during the year. By year's end, all indications were that the first Shuttle launch to the ISS could be safely achieved in May of 2005 and that ISS assembly might be resumed before the end of calendar year 2005. Meanwhile, SOMD continued close coordination with the ISS International Partners that enabled continuous on-orbit station operations in spite of the post-Columbia Shuttle stand-down. Using Russian-provided launch vehicles, the ISS supported a

Mission Directorate: Space Operations

crew of two, successfully maintained critical onboard systems, continued to conduct research experiments, and maintained the capability to support continued ISS assembly after the first of two Shuttle RTF missions are completed. In the meantime, SOMD began planning for the phase-out of the Shuttle after the completion of ISS assembly, and began planning the transition to alternative launch services for long-term ISS logistic support and crew rotation.

The other Mission Directorates within NASA continue to maintain a high level of success for NASA missions using commercial launch services. All three NASA-managed launches of primary payloads in FY2004 were successful. Gravity Probe-B on April 20, 2004; Aura on July 15, 2004; and Messenger on August 3, 2004.

Theme Distribution

Budget Authority (\$ in millions)	FY 2004	FY 2005	FY 2006
International Space Station	1,363.7	1,676.3	1,856.7
Space Shuttle	4,060.9	4,669.0	4,530.6
Space and Flight Support	465.5	485.1	375.6
Total	5,890.1	6,830.4	6,763.0

Note: For all formats, the FY 2004 column reflects the FY 2004 Congressional Operating Plan, dated 9/28/2004. The FY 2005 column reflects the FY 2005 Congressional Operating Plan, dated 12/23/2004. The FY 2006 column represents the FY 2006 President's Budget Submit.

International Space Station

This Theme supports the construction and operations of a research facility in low Earth orbit as NASA's first step in achieving the Vision for Space Exploration. The ISS provides a unique, continuously operating capability to develop medical countermeasures for long-term human space travel: develop and test technologies and engineering solutions in support of exploration; and provide ongoing practical experience in living and working in space. It also supports a variety of pure and applied research for the U.S. and its International Partners. ISS assembly will be completed by the end of the decade. NASA is examining configurations for the Space Station that meet the needs of both the new space exploration vision and our international partners using as few Shuttle flights as possible. A key element of the ISS program is the crew and cargo services project, which will purchase services for cargo and crew transport using existing and emerging capabilities.

Overall Budget

The FY 2006 request is \$1,856.7 million; a \$180.4 million (or 11 percent) increase from the FY 2005 budget. Major features of this budget include:

- Funding is maintained throughout FY 2006 for continuous on-orbit operations and assembly after the Shuttle return to flight;
- Funding for Node 3 and the Environmental Control and Life Support System to accommodate research requirements beyond the baseline capability of U.S. and International Partner Core configuration;
- Funding for the acquisition of cargo and crew services to support the ISS.

Space Shuttle

The Space Shuttle is currently the only launch capability owned by the United States that enables human access to space, and the only vehicle that can support the assembly of the International Space Station (ISS). NASA will phase-out the Space Shuttle in 2010 when its role in ISS assembly is complete.

Overall Budget

The FY 2006 request is \$4,530.6 million; a \$138.4 million (or 3 percent) decrease from the FY 2005 budget. This budget will enable:

- Safe return to flight;
- Continuance of ISS assembly missions; and
- Planning for the phase-out of the Space Shuttle program in 2010, after nearly 30 years of duty.

Space and Flight Support

This theme encompasses Space Communications, Launch Services, Rocket Propulsion Testing, and Crew Health and Safety. Space Communications consists of (1) the Tracking and Data Relay Satellite System (TDRSS), which supports activities such as the Space Shuttle, ISS, Expendable Launch Vehicles, and research aircraft, and (2) the NASA Integrated Services Network, which provides telecommunications services at facilities, such as flight support networks, mission control centers and science facilities, and administrative communications networks for NASA Centers. The Launch Services program focuses on meeting the Agency's launch and payload processing requirements by assuring safe and cost-effective access to space via the Space Shuttle and expendable launch vehicles. Rocket Propulsion Testing supports a core of highly trained rocket test and engineering crews and test facilities. The Crew Health and Safety Program provide oversight and accountability for the total scope of health and safety of NASA's astronaut corps. Plum Brook Decommissioning will be shifted to Corporate G&A beginning in FY 2006.

Overall Budget

The FY 2006 request is \$375.6 million; a \$109.5 million (or 22 percent) decrease from the FY 2005 budget. The budget supports:

- Communications support of human and science missions;
- Launch services and support; and
- Rocket Propulsion Testing.

International Space Station



The International Space Station is a complex of research laboratories in low Earth orbit for conducting unique scientific and technological investigations in the space environment.

President's FY 2006 Budget Request (Dollars in Millions)

<u>International Space Station</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY2009</u>	<u>FY2010</u>
FY 2006 PRES BUD	1,363.7	1,676.3	1,856.7	1,835.3	1,790.9	2,152.3	2,375.5
Changes from FY 2005 Request	-134.4	-186.4	92.9	55.3	12.4	37.8	

Overview: *What NASA Accomplishes through the International Space Station Theme*

The International Space Station (ISS) is a complex of research laboratories in low Earth orbit (LEO) in which American and International astronauts are conducting unique scientific and technological investigations in a space environment. The objective of the ISS is to support scientific research for human space exploration and other activities requiring the unique attributes of humans in space. Consistent with the Vision for Space Exploration, NASA is refocusing U.S. Space Station research on activities that will prepare human explorers to travel beyond LEO, such as the development of countermeasures against space radiation and the long-term effects of reduced gravity. Two crew members are onboard ISS and conducting research operations supported by resupply and crew rotation using Russian Progress and Soyuz vehicles. Increased science capability must wait until on-orbit assembly resumes after the Shuttle returns to flight.

The FY 2006 Budget request provides funding for ISS launch processing activities, vehicle on-orbit assembly with a crew of three, logistics resupply and crew exchange, continuation of research payload and experiment deliveries to orbit. It also includes funding for development of habitability modifications and completion of the regenerative environmental control and life support system needed to increase the crew capacity, consistent with human space exploration research requirements. NASA plans to complete assembly of the ISS by the end of the decade. NASA is examining ISS configurations that meet the needs of both the new space exploration vision and our international partners while using as few Shuttle flights as possible. A key element in the future of the ISS program is the purchase of alternate cargo and crew transportation services to supplement the Shuttle when it is in service, and to replace it when it retires.

Relevance: *Why* NASA conducts International Space Station work

Relevance to national priorities, relevant fields, and customer needs:

The ISS serves as a platform for research activities that will prepare human explorers to travel beyond LEO. Research aboard the ISS is critical to: understanding the effects of space environments on the human body; developing techniques for mitigating these hazards; minimizing the logistical burden of supporting humans far from Earth; addressing remote medical emergencies; and demonstrating enabling technologies for human exploration. The ISS will vastly expand the human experience in living and working in space. The ISS represents an unprecedented level of international cooperation. The ISS Partnership agencies include NASA, the Russian Federal Space Agency (Roskosmos), the Canadian Space Agency (CSA), the European Space Agency (ESA), and the Japanese Aerospace Exploration Agency (JAXA). Additionally, there are several bilateral agreements between NASA and other nations such as Italy and Brazil, resulting in a total of 16 participating nations. International participation in the program has significantly enhanced the capabilities of the ISS.

Relevance to the NASA mission:

The Vision for Space Exploration outlines three tasks required for ISS: 1) Complete assembly by the end of the decade; 2) Focus U.S. research and use of the ISS on supporting space exploration goals; and 3) Conduct ISS activities in a manner consistent with international obligations.

Relevance to education and public benefits:

The ISS is the world's only space station and is central to NASA Vision and Mission. The ISS is a unique teaching tool, opening a new frontier for human learning and experience, allowing the Agency and its partners to pursue a series of related goals. The ISS enables the conduct of research to enable human and robotic exploration and development of space. No other facility can provide prolonged human research interaction in micro-gravity.

Performance

Major Activities Planned for FY 2006:

- Resume assembly of ISS.
- Maintain on-orbit operations.
- Reestablish on-orbit crew of three as early as Shuttle flight ULF1.1.
- Select commercial transportation service provider(s).

Major Recent Accomplishments:

- Sustained two ISS crews during Shuttle stand down.
 - Expanded capabilities for inflight maintenance.
 - Demonstrated techniques for micromanaging consumables.
 - Completed four successful EVA's.
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International Space Station Theme Commitment in Support of the NASA Mission :

NASA Objectives

Multiyear Outcomes

Annual Performance Goals supporting the Multiyear Outcomes

8. Focus research and use of the ISS on supporting space exploration goals, with emphasis on understanding how the space environment affects human health and capabilities, and developing countermeasures.

8.1 By 2010 complete assembly of the ISS, including U.S. components that support U.S. space exploration goals and those provided by foreign partners.

6ISS1 Reach agreement among the International Partners on the final ISS configuration.

8.2 Annually provide 90 percent of the optimal on-orbit resources available to support research, including power, data, crew time, logistics, and accommodations.

6ISS3 Provide 80 percent of FY 2006 planned on-orbit resources and accommodations to support research, including power, data, crew time, logistics and accommodations.

6ISS4 For FY 2006 ensure 90 percent functional availability for all ISS subsystems that support on-orbit research operations.

17. Pursue commercial opportunities for providing transportation and other services supporting International Space Station and exploration missions beyond Earth orbit. Separate to the maximum extent practical crew from cargo.

17.1 By 2010, provide 80 percent of optimal ISS up-mass, down-mass, and crew availability using non-Shuttle crew and cargo services.

6ISS2 Down select transportation service providers from FY 2005 ISS Cargo Acquisition RFP.

Efficiency Measures

6ISS5 Complete all development projects within 110% of the cost and schedule baseline.

6ISS6 Deliver at least 90% of scheduled operating hours for all operations and research facilities.

Program Management

The ISS Theme Director is General Michael C. Kostelnik, Deputy Associate Administrator for ISS and SSP, Space Operations Mission Directorate.

Quality

Independent Reviews:

- Assessment of cost, schedule, and technical risks for crew enhancement option.

Program Assessment Rating Tool (PART):

The International Space Station received a FY 2006 OMB PART rating of: Moderately Effective.

This year's PART found that the program has taken a number of steps to address deficiencies identified last year: 1) The program had improved management and clarity of purpose, the Administration allowed the program to continue construction of the Space Station beyond the U.S. core complete stage; 2) The program has developed annual efficiency measures and improve outcome-oriented long-term performance measure. The program has developed improved new measures that can be used to drive future performance improvements; and, 3) The program has effectively managed its budget reserves, and recommended continued good reserve management to forestall future cost increases. NASA has continued to manage reserves effectively, but Congressional cuts and increases in Space Shuttle return-to-flight costs have eroded the reserves.

Theme: International Space Station

Budget Detail

(Dollars in Millions)

Budget Authority (\$ millions)	FY2004	FY2005	Change	FY2006	Comments
International Space Station	1,363.7	1,676.3	180.4	1,856.7	
International Space Station	1,363.7	1,676.3	180.4	1,856.7	

COMPLIANCE WITH COST LIMITATIONS

NASA's evaluation of this budget projects that the International Space Station may exceed the \$25 billion cost limitation imposed in the NASA Authorization Act of 2000 (P.L. 106-391). Due largely to an increase of \$40M for Columbia related impacts, ISS development is now projected to exceed 5% in FY 2005 and consequently all FY 2005 ISS costs (\$2.06B) will be added to the cumulative total as required by the Act. Costs subject to the cost limitation through FY 2005 are \$25.8B.

Prior to the Columbia accident, NASA projected that development, as defined by the Act, would be substantially completed by the first quarter of FY 2005. Since the accident, the ISS program operations budget has been reduced significantly by appropriations action and internal budget reallocations to support Shuttle return to flight. In addition, the time to complete ISS assembly has been extended by the grounding of the Shuttle fleet, and the ISS research budget has also been reduced. The combined affect of the budget reductions and the delay in completing assembly may result in the Space Station program technically exceeding the development cost limitation of \$25B in FY 2005 even though program development is essentially complete and program performance has improved steadily over the past three years. Strict compliance with the Act would preclude NASA from implementing safety related improvements to the ISS and upgrades in research capabilities needed to enable the Vision for Space Exploration.

Space Shuttle flights supporting ISS are within the \$17.7 billion cost limitation imposed by the act. This is based on the assumption that the point at which the ISS will be substantially complete as defined by the Act will be reached will occur in FY 2007, after which development spending will fall below 5% of the total annual budget.

Of the \$23.7 billion appropriated for the International Space Station and related activities from FY 1994 through FY 2004, approximately \$23.5 billion has been obligated as of September 30, 2004. Remaining FY 2004 funds will be obligated in the course of FY 2005 performance.

A separate report required by the Act will be prepared and submitted.

Theme: International Space Station
Program: International Space Station Program

President's FY 2006 Budget Request (Dollars in Millions)

<u>International Space Station Program</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY2009</u>	<u>FY2010</u>
FY 2006 PRES BUD	1,363.7	1,676.3	1,856.7	1,835.3	1,790.9	2,152.3	2,375.5

Overview

The International Space Station (ISS) is a complex of research laboratories in low Earth orbit (LEO) in which American and international astronauts are conducting unique scientific and technological investigations in a space environment. The objective of the ISS is to support scientific research for human space exploration and other activities requiring the unique attributes of humans in space. Consistent with the Vision for Space Exploration, NASA is refocusing U.S. ISS research on activities that will prepare human explorers to travel beyond LEO, such as the development of countermeasures against space radiation and the long-term effects of reduced gravity.



The FY 2006 Budget request provides funding for the ISS launch processing activities, the resumption of vehicle on-orbit assembly with a crew of three, logistics resupply and crew exchange using the Space Shuttle, continuation of research payload and experiment deliveries to orbit. It also includes funding for full-scale development of habitability modifications and completion of the regenerative environmental control and life support system needed to increase the crew capacity, consistent with human space exploration research requirements.

The International Space Station in low Earth orbit.

NASA plans to complete assembly of the ISS by the end of the decade. NASA is examining ISS configurations that meet the needs of both the new space exploration vision and our international partners while using as few Shuttle flights as possible. A key element in the future of the ISS program is the purchase of alternate cargo and crew transportation services to supplement the Shuttle when it is in service, and to replace it when it retires.

Plans For FY 2006

During FY 2006, ISS will resume assembly, adding truss structure and Node 2 to accommodate attachment in international partner elements in subsequent years. As many as five assembly flights could take place during the fiscal year, but the exact assembly missions to be conducted will not be known until NASA completes its reassessment of the ISS final configuration. Crew size could be expanded once again to three international crew members and with Shuttle support expeditions could increase to three during the year. Included in the budget baseline for the first time is the funding to expand crew size beyond three. ISS will continue to provide safe and reliable assembly, activation, integration and operation of the ISS on-orbit. Ongoing activities in Mission Operations will provide the training, mission control operations, engineering support, and operations planning for continued safe flight. Safe and effective operation of the ISS will be NASA's number one priority. The Advanced Environmental Control and Life Support System, Node 3, and Habitability Upgrades will provide the necessary capabilities to support a total up to seven crew members. The development of the EXPRESS Pallet will begin in FY 2006 and continue through FY 2009. The development of the Space Station Power Transfer System, begun in FY 2004, will be completed in FY 2006.

Changes From FY 2005

- Resumption of U.S. crew rotation and logistics flights as the Space Shuttle returns to flight status.
- Greater than three crew capability included in baseline program.
- ISS reserves have been significantly impacted through appropriations reductions, full cost impacts and Shuttle RTF contributions.

Program Management

JSC is responsible for management of ISS core development. The NASA and JSC management Councils have program oversight responsibility.

Technical Description

The primary objective of the ISS is to support scientific research and other activities requiring the unique attributes of humans in space and is a crucial step in the Vision for Space Exploration. In concert with the new exploration vision, NASA will refocus U.S. Space Station research on activities such as the development of countermeasures against space radiation and the long-term effects of reduced gravity that prepare human explorers to travel beyond low Earth orbit.

Theme: International Space Station
Program: International Space Station Program

Implementation Schedule:

Project	Schedule by Fiscal Year							Purpose	Phase Dates													
	04	05	06	07	08	09	10		Beg	End												
ISS - Dates are subject to change								Assembly Flight 12A - P3/P4 Truss Segment assembly	Tech Form Dev Ops Res	Dec-05 Feb-16												
ISS - Dates are subject to change								Assembly Flight 12A.1 - P5 Truss segment assembly	Tech Form Dev Ops Res	Feb-06 Feb-16												
ISS - Dates are subject to change								Assembly Flight 13A - S3/S4 Truss Segment assembly	Tech Form Dev Ops Res	Apr-06 Feb-16												
ISS - Dates are subject to change								Assembly Flight 13A.1 - S5 Truss Segment assembly	Tech Form Dev Ops Res	Jun-06 Feb-16												
ISS - Dates are subject to change								Assembly Flight 15A - S6 Truss Segment assembly	Tech Form Dev Ops Res	Sep-06 Feb-16												
ISS - Dates are subject to change								Assembly Flight 10A - Node 2 assembly	Tech Form Dev Ops Res	Dec-06 Feb-16												
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	Operations (Ops)																					
	Research (Res)																					
	Represents a period of no activity for the Project																					

Strategy For Major Planned Acquisitions

- None

Key Participants

- International Partners: There are a total of 16 participating nations working on the ISS. Russia, ESA, Japan, Canada, and Italy are providing elements for the International Space Station.
- Boeing: Prime contractor for International Space Station Development and Sustaining Engineering.
- Russia: in addition to ISS elements and crew members, under the partnership agreement Soyuz and Progress have provided critical crew rotation and resupply during the Shuttle down period.

Risk Management

- **RISK:** NASA does not currently have an agreement in place with Russia to provide rescue capability beyond FY 2005. Without crew rescue NASA will not be able to maintain crew presence on ISS. **MITIGATION:** NASA is continuing to work with the International Partners to develop a plan for crew rescue beyond FY 2005.
- **RISK:** ISS assembly is contingent on Shuttle return to flight. Delays will further delay ISS assembly and require NASA reliance on partner launch assets. Cost impacts and on-orbit supportability issues will continue to grow. **MITIGATION:** In order to mitigate cost impacts ISS has continued ground development and delivery of hardware to KSC. The ISS program continues to prepare and maintain readiness for Shuttle return to flight. Coordinated use of partner launch assets has also facilitated uninterrupted ISS operation.
- **RISK:** Resupply of consumables and spare parts. With Shuttle grounded the ISS program has a limited ability to deliver the consumables and spare parts which sustain the crew and hardware systems. If critical functions cannot be sustained the crew will be returned to Earth by Russia's Soyuz vehicle. Until onboard crew are restored, there will be a higher risk of loss of the ISS vehicle. **MITIGATION:** NASA and its International Partners are cooperating to sustain onboard crew and vehicle systems. Russia's Progress and Soyuz spacecraft are delivering the necessary resources while choices of cargo are in response to current and projected conditions. Existing onboard reserves are managed to accommodate system failures and last beyond the arrival of each planned resupply vehicle

Space Shuttle



The program plays a vital role in exploring space and extending human presence across our solar system by providing critical support to the International Space Station.

President's FY 2006 Budget Request (Dollars in Millions)

<u>Space Shuttle</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY2009</u>	<u>FY2010</u>
FY 2006 PRES BUD	4,060.9	4,669.0	4,530.6	4,172.4	3,865.7	2,815.1	2,419.2
Changes from FY 2005 Request	115.9	349.8	204.5	-141.6	-161.2	-215.3	

Overview: *What NASA Accomplishes through the Space Shuttle Theme*

NASA is committed to supporting the first steps of the Vision for Space Exploration - completing the assembly of the International Space Station (ISS). The FY 2006 budget request assumes that the Space Shuttle will return to flight in late spring of 2005. NASA will retire the Space Shuttle once its role in Space Station assembly is complete. On January 14, 2004, the President said in announcing his Vision: "The Shuttle's chief purpose over the next several years will be to help finish assembly of the International Space Station. In 2010, the Space Shuttle - after nearly 30 years of duty - will be retired from service."

International Space Station assembly will be completed by the end of the decade. NASA is examining configurations for the Space Station that meet the needs of both the new space exploration vision and our international partners using as few Shuttle flights as possible. This assessment is critical to allowing NASA to continue work on Space Station assembly safely and retire the Shuttle as planned to make way for the Crew Exploration Vehicle.

The Space Operations Mission Directorate (SOMD) has fundamentally changed the way that the agency goes about the business of human space flight through reexamining and revamping our engineering practices and culture. SOMD has taken actions to meet/exceed the Columbia Accident Investigation Board (CAIB) recommendations, as well as to "raise the bar" with a number of self generated related actions towards compliance and meeting the milestones necessary to support and ensure a safe Return to Flight.

Relevance: *Why* NASA conducts Space Shuttle work

Relevance to national priorities, relevant fields, and customer needs:

In January 2004, President Bush announced the Vision for Space Exploration, which changed the long term focus of the Shuttle Program. The program's primary mission is to support space exploration by completing the assembly of the ISS as planned by the end of decade. The Space Shuttle will be retired in 2010. The Space Shuttle is currently the nation's only human-rated vehicle capable of supporting the ISS and activities in low earth orbit.

Relevance to the NASA mission:

The Space Shuttle supports NASA's mission by ensuring the provision of space access by increasing safety, reliability, and affordability through its remaining service life.

Relevance to education and public benefits:

The Space Shuttle provides long-term benefits to the public through support to the ISS program enabling researchers to undertake experiments in the unique environment of space. The Space Shuttle Program (SSP) is contributing to NASA's goal to excite students about science and mathematics and to help advance the Nation's education goals by supporting the Educator Astronaut Program.

Performance

Major Activities Planned for FY 2006:

- Safely fly planned Space Shuttle manifest.
- Initiate early actions for an orderly phase-out of the program.
- Ensure the proper technical integration of all Shuttle elements.

Major Recent Accomplishments:

- Successful disposition of more than two dozen CAIB and CAIB-related recommendations, including NASA self-initiated "raising the bar" actions.
 - Delivered first set of fully modified flight hardware for assembly and checkout at launch site.
 - Resumed processing activities in preparation for return to flight in late spring of 2005.
 - Incorporated safety and management improvements after reassessing the Shuttle baseline program.
-

Space Shuttle Theme Commitment in Support of the NASA Mission :

NASA Objectives

Multiyear Outcomes

Annual Performance Goals supporting the Multiyear Outcomes

6. Return the Space Shuttle to flight and focus its use on completion of the International Space Station, complete assembly of the ISS, and retire the Space Shuttle in 2010, following completion of its role in ISS assembly. Conduct ISS activities consistent with U.S. obligations to ISS partners.

6.1 Assure public, flight crew, and workforce safety for all Space Shuttle operations, and safely meet the manifest and flight rate commitment through completion of Space Station assembly.

6SSP1 Achieve zero Type A (damage to property at least \$1M or death) or Type B (damage to property at least \$250K or permanent hospitalization of three or more persons) mishaps in 2006;

Theme: Space Shuttle

Efficiency Measures

6SSP2 Complete all development projects within 110% of the cost and schedule baseline.

6SSP3 Deliver at least 90% of scheduled operating hours for all operations and research facilities.

Program Management

The Space Shuttle Theme Director is General Michael C. Kostelnik, Deputy Associate Administrator (ISS and SSP), Space Operations Mission Directorate.

Quality

Independent Reviews:

- Stafford-Covey Return to Flight Task Group - On-going review through FY 2004; will continue until first flight.
- Inspector General Review - June 2004, review of ET Thermal Protection System Debris Shedding Report.
- Inspector General Review - July 2004, Return to Flight Task Group Business Processes.
- Inspector General Review - September 2004, Solid Rocket Booster Bolt Catchers.
- Government Account Office (GAO) Report - November 2004, Space Shuttle Report - Cost for Hubble Science Mission and Implementation of Safety Recommendations.
- GAO Audit - NASA's Shuttle Workforce Change; Report due Spring 2005.
- Inspector General Review - Space Shuttle Imaging, On-going Review through FY 2004; will continue until CAIB recommendations fully implemented, last status April 2004.

Program Assessment Rating Tool (PART):

The Shuttle received a FY 2005 OMB PART rating of: Results Not Demonstrated

The assessment found that the Shuttle had improved its planning and management, but due to the tragic loss of Space Shuttle Columbia in February 2003, the program met almost none of its annual performance measures and made little progress towards achieving its long term goals.

Existing actions are: 1) Plan to retire the Shuttle when its role in assembling the ISS is complete; 2) Return the Shuttle safely to flight and continue using it to support the ISS; and , 3) Develop outcome-oriented short and long-term measures for the Space Shuttle Program.

Budget Detail

(Dollars in Millions)

Budget Authority (\$ millions)	FY2004	FY2005	Change	FY2006	Comments
Space Shuttle	4,060.9	4,669.0	-138.3	4,530.6	
Space Shuttle Program	4,060.9	4,669.0	-138.3	4,530.6	

President's FY 2006 Budget Request (Dollars in Millions)

<u>Space Shuttle Program</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY2009</u>	<u>FY2010</u>
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Overview

NASA is committed to achieving the first steps of the Vision for Space Exploration - completing the assembly of the International Space Station (ISS). The FY 2006 budget request assumes that the Space Shuttle will return to flight in late spring of 2005. The Space Operations Mission Directorate (SOMD) has fundamentally changed the way that the Agency goes about the business of human space flight through re-examining and re-vamping our engineering practices and culture following the Columbia tragedy. SOMD has taken actions to implement the Columbia Accident Investigation Board (CAIB) recommendations, as well as to "raise the bar" with a number of self-generated related actions initiated by NASA towards compliance and meeting the milestones necessary to support and ensure a safe return to flight.



Space Shuttle projects play a vital role in NASA's goal to explore space and extend human presence across the solar system by providing the critical support for launching the Shuttle to continue the assembly and operation of the International Space Station.

Plans For FY 2006

The program's primary mission is: to support space exploration by completing the assembly of the ISS as planned by the end of the decade; safely fly the planned Space Shuttle manifest; initiate early actions for an orderly transition of the program; and ensure the proper technical integration of all Shuttle elements.

Changes From FY 2005

- NASA continues to implement the CAIB recommendations for the Space Shuttle return to flight scheduled for the spring of 2005.
- Cancellation of the Cockpit Avionics Upgrade in December 2004.
- Completion of development for the Advanced Health Monitoring System Phase I Upgrade in FY 2005.

Program Management

The Centers at JSC, KSC, MSFC, and SSC are responsible for SSP project management. The NASA and SOMD Program Management Councils have oversight.

Technical Description

The Space Shuttle comprises three major functions - Program Integration, Ground and Flight Operations and Flight Hardware. Program Integration assures the successful technical integration of all Shuttle elements and payloads into each mission. Ground and Flight Operations provides: final integration and checkout of all hardware elements for launch including support capability for launch countdown and landing; assures successful accomplishment of pre-flight planning; operations control activities; flight crew training and operations support; aircraft maintenance and operations; and life sciences mission operations. Flight Hardware assures the vehicle hardware and software are designed, developed, manufactured, and tested sufficiently to enable safe and reliable transportation.

Implementation Schedule:

Project	Schedule by Fiscal Year							Purpose	Phase Dates							
	04	05	06	07	08	09	10		Beg	End						
Flight and Ground Operations								Provides final integration/checkout of all elements for launch. Also includes a wide variety of planning, training, operations control, crew, life sciences, and aircraft support activities.	Tech Form Dev Ops Res	Dec-10						
Flight Hardware								Produces and maintains the various flight hardware and software elements.	Tech Form Dev Ops Res	Dec-10						
Program Integration								Ensures the proper technical integration of all Shuttle elements and payloads. Includes high-priority mission assurance projects for safety, supportability, and infrastructure.	Tech Form Dev Ops Res	Dec-10						
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Strategy For Major Planned Acquisitions

- Space Flight Operations - prime contractor for integration, ground and flight operations, Orbiter and SRB. Performer will be United Space Alliance.

Risk Management

- RISK:** Failure to complete External Tank modifications. Unlikely occurrence. Potential delay in Space Shuttle return to flight if modifications are not completed or additional modifications are required. **MITIGATION:** Continued to implement all the relevant CAIB recommendations and initiated an aggressive program to eliminate the technical problems for safe Shuttle flights to lessen the likelihood of a risk event.
- RISK:** Delay in implementation of Orbiter Boom Sensor Capability for first two flights. Unlikely occurrence. Potential delay in Space Shuttle return to flight if vehicle is not allowed to fly without this capability for first two flights. **MITIGATION:** Implementation of relevant CAIB recommendations to lessen the likelihood of a risk event occurring.
- RISK:** Failure to complete final External Tank Debris Assessment. Unlikely occurrence. Potential delay in Space Shuttle return to flight if additional risk is uncovered in assessment. **MITIGATION:** Implementation of all relevant CAIB recommendation to lessen the likelihood of a risk event occurring.

Space and Flight Support



Space and Flight Support includes Space Communications, Launch Services, Rocket Propulsion Testing, and Crew Health and Safety program services.

President's FY 2006 Budget Request (Dollars in Millions)

<u>Space and Flight Support</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY2009</u>	<u>FY2010</u>
FY 2006 PRES BUD	465.5	485.1	375.6	370.9	400.0	399.7	399.1
Changes from FY 2005 Request	33.7	-7.0	-59.2	-58.6	-55.7	-53.7	

Overview: *What NASA Accomplishes through the Space and Flight Support Theme*

Space and Flight Support, managed by the Space Operations Mission Directorate, is comprised of several distinct Agency-level services. These services include Space Communications, Launch Services, Rocket Propulsion Testing (RPT), and Crew Health and Safety (CHS). These services are critical for conducting space exploration, aeronautical research, and biological and physical research. These services are provided to a wide range of customers, including NASA scientists and engineers, other Federal agencies, universities, foreign governments and industry interests.

Space and Flight Support transferred the Advanced Systems Program to Exploration Systems beginning in FY 2005, and the Environmental program budget (Plum Brook nuclear facility dismantling and environmental compliance and restoration) to the Corporate G&A account beginning in FY 2006.

Theme: Space and Flight Support

Relevance: *Why* NASA conducts Space and Flight Support work

Relevance to national priorities, relevant fields, and customer needs:

Space and Flight Support includes the enabling capabilities required to conduct space exploration and expand scientific knowledge of the Earth and our universe. Without these capabilities NASA could not perform many of its missions and the American public would not receive many benefits of the Nation's space program.

Relevance to the NASA mission:

Space and Flight Support enables NASA's ability to extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations. Each of these capabilities play a critical support role in the success of NASA's missions and goals.

Relevance to education and public benefits:

Benefits of Space and Flight Support include the relay of scientific data from space to Earth, the safe launching of Space Shuttles and expendable launch vehicles necessary for research, the assurance that rocket systems have been adequately tested, and the testing and implementation of various human health and illness prevention measures. A space program properly supported by this Theme will produce research data that can be used to generate new scientific knowledge through the study of the physical sciences, biological sciences, Earth sciences, planetary science, and more. These activities benefit both the general public and the education community.

Performance

Major Activities Planned for FY 2006:

- Support Space Shuttle return to flight.
- Launch six Expendable Launch Vehicles (ELV) of primary payloads.
- Implement the Mission Operation Voice Enhancement Upgrade Project and the Space Network Expansion Project.
- Participate in technology demonstration of miniature SAR/Communication integrated payload for Chandrayaan-1 mission.
- Evaluate concepts to support Exploration Systems Mission Directorate timelines.

Major Recent Accomplishments:

- Performed three successful NASA-managed ELV launches of primary payloads: Gravity Probe B on April 20, 2004, Aura on July 15, 2004 and Messenger on August 3, 2004.
 - Initiated Steering Committee for Communications and Navigation capability roadmap.
 - Successfully provided administrative and/or mission support through the NASA Space Network and the NASA Integrated Services Network.
 - Maximized efficiency and generated cost savings for NASA and other customers by minimizing duplication in propulsion test capabilities.
 - Initiated Space Communications Architecture Working Group.
-

Space and Flight Support Theme Commitment in Support of the NASA Mission :

NASA Objectives

Multiyear Outcomes

Annual Performance Goals supporting the Multiyear Outcomes

6. Return the Space Shuttle to flight and focus its use on completion of the International Space Station, complete assembly of the ISS, and retire the Space Shuttle in 2010, following completion of its role in ISS assembly. Conduct ISS activities consistent with U.S. obligations to ISS partners.

6.2 Provide safe, well-managed and 95 percent reliable space communications, rocket propulsion testing, and launch services to meet Agency requirements.

6SFS1 Establish the Agency-wide baseline space communications architecture, including a framework for possible deep space and near Earth laser communications services.

6SFS2 Maintain NASA success rate at or above a running average of 95 percent for missions on the FY 2005 Expendable Launch Vehicle (ELV) manifest.

6SFS3 Achieve at least 95 percent of planned data delivery for the International Space Station, each Space Shuttle mission, and low-Earth orbiting missions for FY 2005.

6SFS4 Define and provide space transportation requirements for future human and robotic exploration and development of space to all NASA and other government agency programs pursuing improvements in space transportation.

8. Focus research and use of the ISS on supporting space exploration goals, with emphasis on understanding how the space environment affects human health and capabilities, and developing countermeasures.

8.3 Reduce Crew downtime due to health-related reasons during space flight missions.

6SFS5 Achieve a 5 percent reduction in downtime.

8.5 By 2008, develop and test the following candidate countermeasures to ensure the health of humans traveling in space: bisphosphonates, potassium citrate, and mitodrine.

6SFS6 Certify medical fitness of all crew members before launch.

Efficiency Measures

6SFS7 Complete all development projects within 110% of the cost and schedule baseline.

6SFS8 Deliver at least 90% of scheduled operating hours for all operations and research facilities.

6SFS9 Increase the throughput of the Space Network and NASA Wide Area Network per unit cost on an annual basis.

Program Management

The Theme Directors are Robert Spearing (Space Communications), Karen Poniatowski (Launch Services), Headquarters (CHS), and Stephen Brettel (RPT).

Quality

Independent Reviews:

- Under assessment

Program Assessment Rating Tool (PART):

Space and Flight Support received an FY 2006 PART rating of Adequate.

The assessment found that the programs were generally effective in providing services to NASA and other customers, but needed better plans to improve those services in the future.

Existing actions are: 1) Continue to fund the program at an essentially flat level, but strive to improve the program's results by increasing efficiency; 2) Develop, a plan to independently review all of the major program elements to support improvements and evaluate effectiveness and relevance; 3) Develop better measures that will help to drive program improvement; and 4) Remove ECR from the SFS portfolio and make it a part of NASAs corporate G&A costs.

Budget Detail

(Dollars in Millions)

Budget Authority (\$ millions)	FY2004	FY2005	Change	FY2006	Comments
Space and Flight Support	465.5	485.1	-109.4	375.6	
Advanced Systems	14.3				
Plum Brook Decommissioning	84.2	75.4	-75.4		
Space Communications	157.4	192.7	-19.5	173.3	
Launch Services	141.1	143.8	-19.8	124.0	
Rocket Propulsion Testing	60.0	65.8	3.3	69.1	
Crew Health and Safety	8.5	7.4	1.9	9.3	

Theme: Space and Flight Support

Program: Space Communications

President's FY 2006 Budget Request (Dollars in Millions)

<u>Space Communications</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY2009</u>	<u>FY2010</u>
FY 2006 PRES BUD	157.4	192.7	173.3	174.8	194.8	194.4	194.1

Overview

NASA's flight missions must be linked to the Earth to accomplish their mission objectives. Resulting in the economic advantages over separate systems, NASA uses a common infrastructure to provide these essential links. The responsibility of this infrastructure is vested with the Space Operations Mission Directorate's Space Communications Program. This multi-mission approach dramatically reduces operational costs.

When viewed as a unit, Space Communications activities are one part of an interdependent triad that is absolutely essential to this Nation's space programs. Space Communications functions, while often less visible, are no less vital than the payloads and the launch systems that carry them to their destinations. Mission success is possible only when all three elements meet their performance requirements.

One of the key challenges of the Program is predicting and understanding future mission communications needs and then determining how to meet those needs by incorporating new technology while stimulating and encouraging development of commercial sources. The budget for the Program is based upon flight missions' requirements and those technological development capabilities necessary to meet future mission needs. The Program is also developing a communication and navigation architecture that will support the Exploration and Science Programs through the 2030 time period.

The Program supports the Agency's goal to improve the provision of access to space for the Nation by making it increasingly safe, reliable, and affordable. For more information, please see <http://www.spacecomm.nasa.gov>.



Present complement of eight Satellites on-orbit.

Theme: Space and Flight Support

Program: Space Communications

Plans For FY 2006

Several major functions will continue into FY 2006:

1. Providing reliable, cost-effective operational support to NASA missions and non-NASA missions
2. Enhancing the Space Network (SN) space-to-ground link terminal
3. Conducting studies for a follow-on Tracking and Data Relay Satellites (TDRS) initiative in order to ensure continuity of TDRS services
4. Providing administrative, scientific, and mission control telecommunications services
5. Managing Data Standards with increased focus on transitioning to a more efficient international body
6. Managing NASA's access to Spectrum required to: conduct space and ground based radio transmission, operate navigation systems, and conduct mission sensor operations
7. Supporting the Spectrum environment studies to better understand frequency and device interferences
8. Conducting proof-of-concept demonstration of the Distress Alerting Satellite System involving placement of 406 Mhz distress beacon repeaters on the Global Positioning System

Critical systems are severely past the end of their lifetime. Replacement of systems that frequently fail and are costly to maintain is on-going. Mission Voice systems across the Agency will be replaced over the next several years in order to minimize risk to NASA missions.

Space communications and navigation architecture, responsive to the Vision for Space Exploration, is under development. Tasks will be identified to ensure cost-effective evolution of the architecture capabilities. Some technology initiatives will be restructured to better support the Exploration Program needs.

Changes From FY 2005

- There were no major programmatic changes from the FY 2005 budget submission.

Program Management

The SN, NISN, GN, DSN, and WATR networks are managed and funded by different Directorates. Managing control boards and working groups are established.

Technical Description

TDRS is the core of the SN providing in-flight communications with spacecraft operating in low-Earth orbit. SN provides uplink/downlink facilities at White Sands and Guam. NISN transports administrative, scientific, and mission control data among NASA facilities and its industrial/scientific partners. Both networks provide service to non-NASA missions on a reimbursable basis.

Other activities: initiating and managing communications and navigation technology initiatives to reduce cost; developing an architecture to support Exploration and Science Programs; managing access to communications frequencies in order to conduct space/ground based transmissions; and conducting proof-of-concept for a new space-based search and rescue system to improve distress alert and location capability.

Theme: Space and Flight Support

Program: Space Communications

Implementation Schedule:																					
Project	Schedule by Fiscal Year							Purpose	Phase Dates												
	04	05	06	07	08	09	10		Beg	End											
Space Communications								Provide space communications support to all NASA missions and non NASA missions.	Tech Form Dev Ops Res	Oct-03 Sep-10											
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Strategy For Major Planned Acquisitions

- Mission Operations Voice Enhancement for telecommunications network. Full and Open Competition.

Key Participants

- Federal Government Agencies (Network support, Comm/Navigation Architecture, Standards and Spectrum Management, special studies).
- Corporations (Network and Systems implementation, Technology, Architecture, special studies).

Risk Management

- RISK: Reliability studies show an eventual need to procure additional TDRS satellites to meet legacy and projected new mission requirements on the SN.

Highly likely MITIGATION: Senior level discussions are on-going.

- RISK: Space Network (SN) services are provided to non-NASA missions on a reimbursable basis. This reimbursement, which is offset against the NASA budget request, is anticipated to continue at the current level through FY 2006. A decline in this reimbursement may require additional NASA appropriated funds for the SN.

Possible after 2006 MITIGATION: Discussions with reimbursable customers are on-going.

Theme: Space and Flight Support

Program: Launch Services

President's FY 2006 Budget Request (Dollars in Millions)

<u>Launch Services</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY2009</u>	<u>FY2010</u>
FY 2006 PRES BUD	141.1	143.8	124.0	116.1	122.8	123.0	122.6

Overview

Assuring reliable and cost effective access to space for civilian missions is critical to achieving the Vision for Space Exploration NASA has been asked to undertake for the Nation. NASA has assigned responsibility for understanding the full range of civil space launch needs to the Space Operations Mission Directorate Launch Services Program. This program, which works closely with other government agencies and the launch industry, seeks to ensure that the most safe, reliable, on time, cost-effective launch opportunities are available on a wide range of launch systems to achieve the national goals for leadership in understanding the earth and exploring the universe.

A key challenge of the Program is understanding the launch needs of the different civil government customers. These customers seek to: understand Earth processes, including use of weather satellites; explore the universe with planetary probes, Mars rovers, and orbiters; and, to enhance life on earth by understanding the universe in which we live using various scientific missions. The Program purchases fixed-price launch services from domestic suppliers and provides oversight to ensure that these valuable, one of a kind missions safely leave the earth to explore the world beyond.

The Program works with customers from universities, industry, government agencies and international partners from the earliest phase of a mission.

The funding provides the capability for NASA to maintain critical skills providing technical management of launch services on the full fleet of existing and new launch systems.



Messenger Launch on Delta II at Cape Canaveral on August 3, 2004.

Theme: Space and Flight Support

Program: Launch Services

Plans For FY 2006

FY 2006 funding supports a wide range of activity critical to fulfilling NASA's science and exploration agenda. The six NASA launches planned for FY 2006 are: Spacetech-5; Aeronomy of Ice in the Mesosphere (AIM); Solar Terrestrial Relations Observatory (STEREO); Dawn; New Horizons and Geostationary Operational Environmental Satellite O (GOES-O). Spacetech-5 and AIM will be flown on Pegasus XL vehicles, STEREO and Dawn on Delta IIs, New Horizons on an Atlas V and GOES-O on a Delta IV. See Science Mission Themes for mission details.

- Advanced planning and trade studies for some 20 scientific and exploration missions.
- Advanced planning to support International Space Station cargo services.
- Continued partnership with the Defense Advanced Research Projects Agency (DARPA) on the FALCON program seeking to enable new cost effective launch capability for small payloads.
- Advanced planning to support the evolving launch requirements for the Moon and Mars exploration.
- Complete certification of the new Delta IV and Atlas V launch systems planned for NASA use in FY 2006.

Changes From FY 2005

- There were no major programmatic changes from the FY 2005 budget submission.

Program Management

NASA consolidated responsibility for understanding and meeting Agency launch requirements in the Launch Services Program.

Technical Description

Applying lessons learned from the Columbia Accident Investigation, the Program has Agency responsibility for acquiring launch services from private sector suppliers and/or DoD and for gathering the necessary engineering talent focused on moving scientific inquiry safely from the ground to space. The technical team serves as the bridge between NASA customers and launch contractors to assure that standards for safety and mission success are consistently applied with one common objective: To provide the systems level engineering oversight that strives to offer every NASA mission an opportunity to leave the Earth on a journey of exploration. This team has achieved a high level of mission success for NASA missions and consistently outperforms its goal of 95 percent or better launch success.

Implementation Schedule:																						
Project	Schedule by Fiscal Year							Purpose	Phase Dates													
	04	05	06	07	08	09	10		Beg	End												
Launch Services								Responsible for enabling access to space for all NASA missions and other select governemnt missions as required.	Tech Form Dev Ops Res	Oct-03 Sep-10												
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Theme: Space and Flight Support

Program: Launch Services

Strategy For Major Planned Acquisitions

- The Expendable Launch Vehicle Integrated Support (ELVIS) contract base period expires 9/30/05. The Program Office will evaluate and recommend whether existing options will be exercised.
- The NASA Launch Services ELV contracts have a bi-annual on-ramp period available to the Launch Services every February and August for new emerging Launch Services providers to be considered.

Key Participants

- Domestic launch service providers offering vehicles in all sizes from a variety of launch locations.
- Reimbursable Federal agency customers (NOAA, MDA).
- Other Federal agencies engaged in space launch (DOD, USAF, NRO, DARPA) to collaborate and coordinate the use of limited launch infrastructure assets.

Risk Management

- **RISK:** The lack of growth in the commercial launch market has placed a great strain on domestic launch providers' ability to offer government users a full range of launch opportunities. **MITIGATION:** The Program utilizes the Flight Planning Board as the Forum to aggregate Agency requirements and enable a purchasing strategy that helps to sustain capability in different market niches. The Program coordinates with other government space launch users to understand market impacts on space launch and work together on creative mitigation approaches.
- **RISK:** Launch systems are designed and operated by humans and have a less than 100 percent reliability. NASA missions, often one of a kind payloads, warrant an assured access to space strategy that is constantly vigilant and strives for success. **MITIGATION:** Assure the Program has the resources and tools needed to continue to provide the Nation with highly skilled systems level engineering talent focused on leveraging partnerships with industry and other government agencies to achieve sustained mission success for the full range of civil missions seeking access to space.

President's FY 2006 Budget Request (Dollars in Millions)

Rocket Propulsion Testing	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010
FY 2006 PRES BUD	60.0	65.8	69.1	70.1	71.8	71.9	72.1

Overview

The Rocket Propulsion Test (RPT) Program manages NASA's rocket propulsion test assets, activities, and resources; advances test technologies; and reduces propulsion test costs through the safe and efficient utilization of rocket propulsion test facilities in support of NASA programs, commercial partners, and the Department of Defense (DoD). The Program ensures appropriate levels of capability and competency are maintained for items such as engine development and certification, flight support testing, anomaly resolution, upgrades, life cycle testing, and certification extensions.

The Program strategy is to: fund and maintain a core capability of skilled test and engineering crews and test stand facilities; consolidate and streamline NASA's rocket test infrastructure; establish and maintain world-class test facilities; modernize test facility equipment; provide non-project specific equipment and supplies; and develop effective facility/infrastructure maintenance strategies and performance. The performing Centers are located at: Stennis Space Center (SSC), Marshall Space Flight Center (MSFC), Johnson Space Center-White Sands Test Facility (JSC-WSTF), and Glenn Research Center-Plum Brook Station (GRC-PBS). These facilities have a replacement value of two billion dollars.

RPT supports several National Strategic Objectives including: returning the Space Shuttle to flight; developing a new Crew Exploration Vehicle for missions beyond low Earth orbit; and developing and demonstrating power generation and propulsion capabilities required to support exploration of Mars and other destinations. Further information can be found at: <https://rockettest.ssc.nasa.gov/>



The Rocket Propulsion Test Program is performed at four NASA Centers.

Theme: Space and Flight Support
Program: Rocket Propulsion Testing

Plans For FY 2006

Support for the current inventory of 32 test stands in various operational states ranging from active to mothballed will continue to be funded. Studies to identify "at-risk" support and test facilities will be completed and used to assist in funding decisions relative to supporting the Vision for Space Exploration. In addition, the RPT Program will continue to assist in the requirements definition for some low Earth orbit and in-space propulsion systems and related technologies. Investments in infrastructure for RPT performing Centers are planned. Specifically, refurbishments to the steam system at Glen Research Center - Plum Brook Station are planned. The Program Commitment Agreement was drafted in FY 2004 and submitted to Space Operations Mission Directorate for formal review and acceptance. The Program Management Plan was also drafted and coordinated with the performing RPT Centers in FY 2004. Efforts are underway to have both program documents approved and signed during FY 2005.

Changes From FY 2005

- No significant changes.

Program Management

The Program Office is located at SSC. The management of the program is accomplished through the RPT Management Board chaired by the Program Manager.

Technical Description

RPT provides for non-programmatic support of test facilities at the performing Centers. This includes funding for test facility management, maintenance, sustaining engineering, operations, and facility modernization required to keep test-related facilities in a state of operational readiness. The RPT budget does not include resources to support the marginal costs of testing (e.g., direct labor, propellants, materials, program-unique facility modifications, etc.) since these activities are to be funded by programs as a direct cost when they occupy the RPT test stands. NASA, DoD, and commercial partners schedule time for the RPT-supported test stands. The scheduled time may include program-specific facility modifications in addition to the testing of the program-specific test article.

Implementation Schedule:																					
Project	Schedule by Fiscal Year							Purpose	Phase Dates												
	04	05	06	07	08	09	10		Beg	End											
Rocket Propulsion Test Program								Provides development of space transportation propulsion systems by sustaining "world-class" core capabilities required by rocket engine development and testing programs.	Tech Form Dev Ops Res	Oct-96 Sep-10											
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Strategy For Major Planned Acquisitions

- A new Test Operations Contract, TOC, was in place effective 1 September 2004. The TOC allows critical test operations skills and efficiencies to be maintained and shared between affected Centers.

Theme: Space and Flight Support

Program: Rocket Propulsion Testing

Key Participants

- The primary contractors for Technical Services and Support are Jacobs-Sverdrup, Mississippi Space Services, Honeywell, and Plum Brook Operations Support Group.

Risk Management

- **RISK:** A formal Risk Management Plan is in development in FY 2005. **MITIGATION:** Plan is in development.

Theme: Space and Flight Support

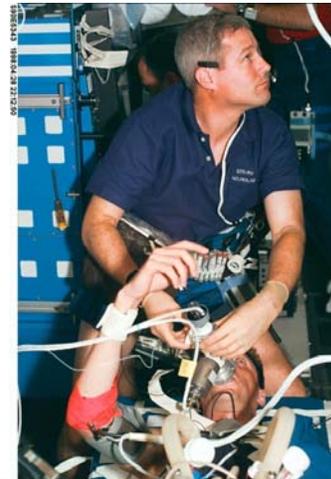
Program: Crew Health and Safety

President's FY 2006 Budget Request (Dollars in Millions)

<u>Crew Health and Safety</u>	<u>FY2004</u>	<u>FY2005</u>	<u>FY2006</u>	<u>FY2007</u>	<u>FY2008</u>	<u>FY2009</u>	<u>FY2010</u>
FY 2006 PRES BUD	8.5	7.4	9.3	9.8	10.6	10.4	10.3

Overview

The purpose of the Crew Health and Safety (CHS) Office is to raise awareness and accountability for the total scope of health and safety of NASA's astronaut corps. The CHS Office is responsible for providing a program of comprehensive health care necessary to enable a healthy and productive crew during all phases of spaceflight missions, and to prevent and mitigate long-term negative health consequences. The major functions of Crew Health and Safety are to provide headquarters leadership, advocacy and support for efforts to: design, implement, and manage a comprehensive health care program for spaceflight; provide mission support on operational health-related issues and tasks; conduct astronaut medical selection certification and health maintenance; and conduct technology development and clinical operational efforts required to support long-duration spaceflight missions.



(28 April 1998) --- Jay C. Buckey, Jr., and James A. Pawelczyk, payload specialists, conducting human autonomic experiments in the Neurolab of the Earth-orbiting Space Shuttle Columbia.

Plans For FY 2006

NASA will finalize the development of a standardized battery of clinical and physiological tests for all crewmembers, to use in health risk/operations impact analysis. Workshops are planned to refine evidence-based information with the intent of applying this information to operational medicine. Crew Health Surveillance special projects include a two-year study of the effect of space flight on pharmacologic agents determining whether or not space flight significantly alters the effectiveness of medications. Real-Time Mission Evaluation supports the definition/implementation of medical care system requirements for all missions in conjunction with medical operations efforts. This is a program that responds as needed to address problems that may arise with medical care systems. Ongoing maintenance of the Longitudinal Study of Astronaut Health which archives astronaut medical record information in database form and performs data analyses to support clinical care and long-term health assessments of the astronauts. Remote Medical Diagnostic and Informatics will design, implement and maintain a comprehensive data management infrastructure to support the objectives of the Space Medicine Program. The Health Maintenance System Inventory Tracking Tool and Mission Planning Tool will be implemented this year. NASA will continue adding all forms of clinical data to the Computerized Medical Information System, which is an electronic medical record used for real-time documentation of clinical care at the point of care. Develop and maintain environmental standards for all space exploration platforms. Design, develop, and implement a comprehensive health care system for space flight.

Theme: Space and Flight Support

Program: Crew Health and Safety

Changes From FY 2005

- There were no major programmatic changes from the FY 2005 budget submission.

Program Management

Crew Health and Safety is managed at Headquarters, with its core programs performed for SSP and ISS by the Life Sciences Directorate at JSC.

Technical Description

Manage health care for entire Astronaut Corps, both in space and during ground-based training. Certify the medical health of astronauts before flight and provide them with care throughout their careers. Medically support the FY 2005 Shuttle return to flight activities including planning, training, and medical operations support.

Implementation Schedule:										
Project	Schedule by Fiscal Year						Purpose	Phase Dates		
	04	05	06	07	08	09		10	Beg	End
Crew Health and Safety(CHS)							Protects our astronauts from the hazards of space travel and identifies methods that allow astronauts to improve their performance.	Tech		
								Form		
								Dev		
								Ops	Oct-03	Sep-10
								Res		

	Tech & Adv Concepts (Tech)
	Formulation(Form)
	Development (Dev)
	Operations (Ops)
	Research (Res)
	Represents a period of no activity for the Project

Strategy For Major Planned Acquisitions

- No major acquisition planned.

Key Participants

- The International Partners are involved in many areas of operational medicine planning.

Overview

The NASA Office of Inspector General (OIG) budget request for Fiscal Year 2006 is \$32.4 million. The request supports our mission to prevent and detect crime, fraud, waste, abuse, and mismanagement while promoting economy, effectiveness, and efficiency within the Agency. This request represents the OIG resources needed at NASA Headquarters and field offices to fulfill the OIG mission. Recognizing that the number of identified audits, investigations, inspections, assessments, and other activities significantly exceed the available resources; continuous adjustments of priorities will be necessary to ensure that a balanced coverage of NASA's programs and operations is maintained, critical and sensitive matters are promptly evaluated and investigated, and that all OIG customers receive timely, accurate, and complete responses.

The OIG, Office of Audits (OA) conducts independent, objective audits and reviews of NASA and NASA contractor programs and projects to improve NASA operations as well as a broad range of professional audit and advisory services. It also comments on NASA policies and is responsible for the oversight of audits performed under contract or by other Federal agencies. The OA helps NASA accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the economy, efficiency and effectiveness of NASA operations.

The OIG Office of Investigations (OI) identifies, investigates, and refers for prosecution cases of crime, waste, fraud, and abuse in NASA programs and operations. The OIG's Federal law enforcement officers investigate false claims, false statements, conspiracy, theft, mail fraud, and violations of Federal laws, such as the *Procurement Integrity Act* and the *Anti-Kickback Act*. Through its investigations, the OI also seeks to prevent and deter crime at NASA. The OI Computer Crimes unit has solved cases involving extortion of NASA and contractor personnel, loss of communications services, and the use of NASA-funded networks to further criminal enterprises including the compromise of advanced technologies and industrial espionage.

NASA's OIG FY 2006 request is broken out as follows:

- 82.7 percent of the proposed budget is dedicated to personnel and related costs, including salaries, benefits, monetary awards, worker's compensation, transportation subsidies and training, as well as the government's contributions for Social Security, Medicare, health and life insurance, retirement accounts, matching contributions to Thrift Savings Plan accounts, the required 25 percent law enforcement availability pay for criminal investigators, and permanent change of station costs.
- 4.0 percent of the proposed budget is dedicated to travel, including the cost of transportation, per diem at current rates, and related expenses. The OIG staff is located at 14 offices in or near NASA installations and contractor facilities.
- 13.3 percent of the proposed budget is dedicated to operations and equipment, including government vehicles, special equipment for criminal investigators, and information technology equipment unique to the OIG. The Agency's annual financial audit is included in this funding.

Budget Authority (\$ in millions)	FY 2004	FY 2005	FY 2006
Personnel and Related Costs	23.0	25.5	26.8
Travel	1.2	1.2	1.3
Operations and Equipment	2.9	4.6	4.3
Total	27.1	31.3	32.4