The International Space Station (ISS) is a complex of research laboratories in low Earth orbit for conducting unique scientific and technological investigations in microgravity environment.

# International Space Station

## MAJOR EVENTS IN FY 2005

- Increase crew size to 3 persons delivered by Shuttle after the Shuttle returns to flight; and
- Resume ISS Assembly with Shuttle after it returns to flight.

## **Theme:** International Space Station

### OVERVIEW

The International Space Station (ISS) is a complex of research laboratories in low Earth orbit in which American and International astronauts are conducting unique scientific and technological investigations in a microgravity environment. The primary objective of the ISS is to support scientific research and other activities requiring the unique attributes of humans in space. 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.

Although the Columbia accident has delayed assembly, two crew members are on board and are conducting reduced on-orbit research operations supported by resupply and crew rotation using Russian Progress and Soyuz vehicles. The program continues to complete flight hardware development in order to minimize the financial impact of the assembly delay. Increased science capability must wait until on orbit assembly resumes after the Shuttle returns to flight.

Following large Space Station cost overruns in previous years, the Administration linked the development or deployment of any ISS components beyond the "U.S. Core Complete" configuration and delivery of international partner elements to the program's ability to demonstrate improvement in cost estimation and resolution of technical issues. Since then, NASA has implemented numerous positive changes that have resulted in improved program management and control over the program's cost. The Space Station program is now free to move forward to complete construction of the International Space Station, including those U.S. components that support the goals of U.S. space exploration, by the end of the decade.

The FY05 Budget provides funding for continued development of the vehicle, operations to support continued assembly, logistics re-supply, crew exchange, research operations and other utilization within the constraints of uncertainty about when the Shuttle will return to flight. Impacts from the Shuttle hiatus, programmatic changes, and institutional requirements have resulted in reductions to the ISS Program's estimated budget reserve. Once the Shuttle returns to flight and the schedule for future assembly of the Space Station is understood, the program will undergo a re-baselining activity.

NASA plans to dedicate the Shuttle to ISS assembly and phase out the Shuttle when its role in ISS assembly is complete, planned by the end of this decade. NASA plans to acquire cargo and crew transportation services to supplement and eventually replace the Space Shuttle. The ISS program has a new project, ISS Cargo and Crew Services, which will responsible for the purchase of launch, delivery, and earth return services for ISS cargo including the replacement of failed orbital replacement units, the replenishment of research materials and products, and the purchase of human-rated launch, delivery, and return capability for expedition crew rotation.

| Missions | Goals supported by this Theme | Objectives supporting those Goals |
|---|---|---|
| To Understand and Protect Our Home Planet | 3. Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia. | 3.1 Enhance the Nation's security through partnerships with DOD, DHS and other U.S. or international government agencies. |
| Exploration Capabilities | 8. Ensure the provision of space access, and improve it by increasing safety, reliability, and affordability. | 8.1 Assure safe, affordable, and reliable crew and cargo access and return from the International Space Station. |
| | | 8.4 Assure capabilities for world-class research on a laboratory in low Earth orbit. |
| | 9. Extend the duration and boundaries of human space flight to create new opportunities for exploration and discovery. | 9.3 Demonstrate the ability to support a human presence in low Earth orbit as a stepping-stone to human presence beyond. |

### RELEVANCE

The ISS will serve as a platform for research on activities that prepare human explorers to travel beyond low Earth orbit, such as the development of countermeasures against space radiation and the long-term effects of reduced gravity. In addition, the ISS will vastly expand the human experience in living and working in space, encourage and enable development of space, and provide a capability to perform unique, long-duration, space-based research in cell and developmental biology, plant biology, human physiology, fluid physics, combustion science, materials science and fundamental physics. ISS will also provide a unique platform for making observations of Earth's surface and atmosphere, the Sun, and other astronomical objects. The ISS represents an unprecedented level of international cooperation. Space Station Partnership agencies include NASA, the Russian Aviation and Space Agency (Rosaviakosmos), 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. During the current Shuttle hiatus, Russian participation has been critical to the continued operation of the Space Station.

## **Theme:** International Space Station

| Education and Public Benefits |
|---|
| The ISS is the world's only space station and is central to the NASA vision and mission. The ISS will be used as a unique teaching tool, opening a new frontier for human learning and experience, and allows the Agency and its partners to pursue a series of related goals. It enables the conduct of research to enable human and robotic exploration and development of space, as well as basic and applied research in biological and physical sciences and applied research and development. No other facility can provide provides prolonged human research interaction in zero-gravity and routine sample return to Earth. |

### IMPLEMENTATION

This Theme is composed of two Development and three Operational areas. Individual information templates are included for each. Enterprise Official is William F. Readdy, Associate Administrator for Space Flight. The theme Director is General Michael C. Kostelnik, the Deputy Associate Administrator for ISS and Space Shuttle. The program management and reporting flows from the Program Manager, William Gerstenmaier, located at the Johnson Space Center, to the Deputy Associate Administrator for ISS and the Space Shuttle Program. The Deputy Associate Administrator for ISS and the Space Shuttle Program reports directly to the Associate Administrator for Space Flight who reports directly to the NASA Administrator. The Agency Program Management Council has oversight responsibility.

Go to Project Homepage for more information: http://spaceflight.nasa.gov/station/index.html

The Space Station programs expects to complete the "U.S. core" of the Space Station approximately 17 months after the Shuttle returns to flight and to complete the entire Space Station (including international contributions) approximately five years after the Shuttle returns to flight. To achieve NASA's plan to phase out the Space Shuttle by the end of the decade, NASA may modify the assembly sequence of the Space Station. The following chart reflects the ISS implementation schedule based on the Shuttle returning to flight in September 2004.

### IMPLEMENTATION SCHEDULE

| Theme Element | Schedule | Purpose |
|---|---|---|
| ULF1 - Logistics Module | Sep-04 | Research and Resupply; Maintenance |
| 12A - P3/P4 Truss Segment | Feb-05 | Truss Assembly |
| 12A.1 - P5 Truss Segment | Apr-05 | Truss Assembly & Logistical Support |
| 13A - S3/S4 Truss Segment | Jun-05 | Truss Assembly |
| 13A.1 - S5 Truss | Sep-05 | Truss Assembly & Logistical Support |
| 15A - S6 Truss Segment | 10/5/2004 | Truss Assembly |
| 10A - Node 2 | Feb-06 | US Core Complete |
| ULF2 - Logistics Module | Mar-06 | Research and Re-supply; Maintenance |
| 1E - ESA Columbus Laboratory | Jun-06 | Partner Element Delivery & Activation |
| 1J/A - Japanese Experiment Logistics Module | Jan-07 | Partner Element Delivery & Activation |
| 2J/A - JEM Exposed Facility | 10/1/2007 | Partner Element Delivery & Activation |
| 1J - Japanese Experiment Module (JEM) | 4/1/2007 | Partner Module Delivery & Activation |
| 14A - Cupola | 6/1/2008 | Element & Equipment Delivery - Int'l Partner Complete |
| 9A.1 - Russian Science Power Platform (SPP) | Aug-09 | Partner Element Delivery & Activation |
| ULF7 - Centrifuge Accommodation Module | Nov-09 | Utilization and Module Delivery |

Tailoring: Full compliance with NPG 7120.5B was achieved in FY 2003.

### STATUS

By end of FY2003, a total of 37 U.S. and Russian flights, as well as seven crew increments, were accomplished, with an eighth crew increment underway. The current crew will operate the Station until the end of April 2004.

## **Theme:** International Space Station

ISS operations were significantly impacted by the loss of the Space Shuttle Columbia on February 1, 2003. The next ISS crew exchange used a Soyuz spacecraft, 6S, to replace the three-member Expedition 6 with the two-man Expedition 7 crew. The Expedition 8 crew is continuing to conduct a limited research program.

ISS achievements during FY2003 included**:**

- The addition of two Space Station truss segments (S1 and P1) with ancillary equipment in October and in November 2002;
- The accumulation of a total of 51 extravehicular activities, with 318.5 hours accumulated time, by U.S. and Russian crewmembers in support of ISS assembly;
- The launch of two Russian Soyuz spacecraft (Soyuz 5 and 6)-- the first a "taxi" flight carrying Belgian guest cosmonaut Frank De Winne, the second with the ISS Expedition 7 crew; and
- The launch of three Progress logistics flights (10P, 11P, 12P), taking consumables, spare parts and propellant to the Station.

The Program Assessment and Rating Tool (PART) evaluation concluded that Space Station program had not demonstrated results, due mainly to the loss of the Space Shuttle Columbia, which affected the program's ability to meet several of its annual performance goals or to make large strides toward achieving long-term goals. To improve the next PART evaluation, the program must resume assembly operations and develop additional annual and long-term efficiency measures.

### PERFORMANCE MEASURES

| **Outcomes/Annual Performance Goals (APGs)** | |
|---|---|
| *Outcome 3.1.4* | *Demonstrate effective international collaboration on the International Space Station.* |
| 5ISS1 | In concert with the ISS International Partners, extend a continuous two-person (or greater) crew presence on the ISS through the end of FY2004. |
| *Outcome 8.1.1* | *Acquire non-Shuttle, crew and cargo access and return capability for the Station by 2010.* |
| 5ISS7 | Baseline a strategy and initiate procurement of cargo delivery service to the ISS. |
| *Outcome 8.4.1* | *Provide a safe, reliable, and well-managed on-orbit research facility.* |
| 5ISS2 | Achieve zero Type-A (damage to property at least $1M or death) or Type-B (damage to property at least $250K or permanent disability or hospitalization of 3 or more persons) mishaps in FY2004. |
| 5ISS3 | Based on the Space Shuttle return-to-flight plan, establish a revised baseline for ISS assembly (through International Core Complete) and research support. |
| 5ISS4 | Provide at least 80% of up-mass, volume and crew-time for science as planned at the beginning of FY2004. (Supports Objective 1.1, 3.5, 4.1 and 4.2) |
| *Outcome 8.4.2* | *Expand the ISS crew size to accommodate U.S. and International Partner research requirements.* |
| 5ISS5 | Obtain agreement among the International Partners on the final ISS configuration. |
| *Outcome 9.3.1* | *Develop experience in working and living in space by continuously supporting a crew on-board the ISS through 2016.* |
| 5ISS6 | Continuously sustain a crew to conduct research aboard the ISS |
| **Uniform Measures** | |
| 5ISS8 | Complete all development projects within 110% of the cost and schedule baseline. |
| 5ISS9 | Deliver at least 90% of scheduled operating hours for all operations and research facilities. |

### INDEPENDENT REVIEWS

| Review Types | Performer | Last Review Date | Next Review Date | Purpose |
|---|---|---|---|---|
| Crew Enhancement Option Assessment | TBD | N/A | 6/04 | Assessment of cost, schedule, and technical risks for crew enhancement option. |

## **Theme:** International Space Station

### BUDGET

| Budget Authority ($ millions) | FY 2003 | FY 2004 | Change | FY 2005 | Comments |
|---|---|---|---|---|---|
| **International Space Station** | **1,462.4** | **1,498.1** | **+364.6** | **1,862.7** | |
| Development | 231.9 | 146.8 | -47.8 | 99.0 | |
| ISS Core Development | 200.1 | 101.3 | -31.9 | 69.4 | |
| ISS Capability Upgrades | 31.8 | 45.5 | -15.9 | 29.6 | |
| Operations | 1,230.5 | 1,351.3 | +412.4 | 1,763.7 | |
| Spacecraft Operations | 658.6 | 710.2 | +101.8 | 812.0 | |
| Launch and Mission Operations | 289.6 | 439.9 | +18.4 | 458.3 | |
| Operations Program Integration | 282.3 | 201.2 | +152.2 | 353.4 | |
| ISS Cargo/Crew Services | | | +140.0 | 140.0 | New Activity |

Indicates changes since the previous year's President's Budget Submit

Indicates budget numbers in full cost.

**Theme:** International Space Station
**Development:** ISS Core Development

## PURPOSE

| Objectives | Performance Measures |
|---|---|
| 8.4 | 5ISS3,8 |

Vehicle development of the ISS is responsible for providing an on-orbit, habitable laboratory for science and research activities, including flight and test hardware and software, flight demonstrations for risk mitigation, facility construction, Shuttle hardware and integration for assembly and operation of the Station, mission planning, and integration of Space Station systems.

## OVERVIEW

Space Station elements are provided by U.S. and international partners Russia, Europe, Japan, and Canada. The U.S. elements include nodes, laboratory module, airlock, truss segments, photovoltaic arrays, three pressurized mating adapters, an unpressurized logistics carrier, and a cupola. Various systems have been developed by the United States, including thermal control, life support, navigation, command and data handling, power systems, and internal audio/video. Other U.S. elements being provided through bilateral agreements include the pressurized logistics modules provided by the Italian Space Agency, Node 2 provided by ESA, and the centrifuge accommodation module/centrifuge provided by the Japanese. During FY04, it is expected that the Space Shuttle will return to flight and the assembly of the ISS will resume. In the meantime, the ISS will continue on-orbit research operations with two crew, and with resupply and crew rotation provided by Russian Progress and Soyuz vehicles. Expedition 8 will be completed and expeditions nine and ten will be accomplished during FY04. Node 2 and the last truss segment (S6) will be completing their final integrated testing and be ready for final pre-launch test and checkout in preparation for Space Shuttle integration.

## PROGRAM MANAGEMENT

The program management and reporting flows from the Program Manager, William Gerstenmaier, located at the Johnson Space Center (JSC), to the Deputy Associate Administrator (DAA) for ISS and SSP. The DAA for ISS & SSP reports directly to the Associate Administrator for Space Flight who reports directly to the NASA Administrator. The Agency Program Management Council (PMC) has oversight responsibility. Full compliance with NPG 7120.5B was achieved in FY 2003.

## TECHNICAL COMMITMENT

Program Commitment Agreement signed August 19, 2003. The baseline was defined by a May 2002 Cost Analysis Requirements Document.

| Technical Specifications | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| Crew Size | Three international crew members | -- |
| Power | 80 Kilowatts | -- |
| Accommodations | 27 U.S. User Racks | -- |
| External Payload Sites | 24 External payload sites on truss. Ten sites on JEM Exposed Facility | -- |
| Optical Viewing | Nadir viewing optical research window | -- |
| Ku Band Downlink | 1.5 - 2.46 Terabits per day average | -- |
| Operational Life | Ten years after deployment of the U.S. Laboratory (FY 2016) | -- |

| Schedule | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| Dates subject to change depending on Shuttle return to flight and possible modifications to the ISS assembly sequence. | | |
| 9A - S1 Truss | Launched October 2002 | +2 months |
| 11A - P1 Truss | Launched November 2002 | +2 Months |
| 12A - P3/P4 Truss | Feb 2005 | 0 months |
| 12A.1 - P5 Truss | Apr 2005 | 0 months |
| 13A - S3/S4 Truss | Jun 2005 | +21 months |
| 13A.1 - S5 Truss | Sep 2005 | +24 months |
| 15A - S6 Truss | Oct 2005 | +22 months |
| 10A - Node 2 - U.S. CORE COMPLETE | Feb 2006 | +24 months |

## ACQUISITION STRATEGY AND PERFORMING ORGANIZATIONS

The Prime Contractor for design, development, test and evaluation of major elements of U.S. Flight Hardware and Engineering Support for the integration of the Space Station is Boeing Aerospace. The prime contract which covers development and operations has been extended through September 2006. In FY2003, direct procurements from Boeing represented about 37% of budget authority in development and operations.

| Current Acquisition | Actual* | Selection Method | Actual* | Performer | Actual* |
|---|---|---|---|---|---|
| Cooperative Agreement | 0% | Full & Open Competition | 18% | Industry | 99% |
| Cost Reimbursable | 87% | Sole Source | 82% | Government | 0% |
| Fixed Price | 4% | | 100% | NASA Intramural | 0% |
| Grants | 0% | | | University | 0% |
| Other | 9% | Sci Peer Review | 0% | Non Profit | 1% |
| *As of FY 2003 direct procurement | 100% | *As of FY 2003 direct procurement | | *As of FY 2003 direct procurement | 100% |

| Future Acquisition - Major | Selection | Goals |
|---|---|---|
| None | | |

## AGREEMENTS

External: 1.) Intergovernmental Agreement (IGA) Active (1/29/98) 2.) NASA/RSA Memorandum of Understanding (MOU) Active (1/29/98) 3.) NASA/ESA MOU Active ( 1/29/98) 4.) NASA/Government of Japan (GOJ) MOU Active (2/24/98) 5.) NASA/CSA MOU Active (1/29/98) 6.) NASA/ESA Early Utilization Agreement Active (3/18/97) 7.) NASA/Italian Space Agency (ASI) MOU on the Design, Development, Operation, and Utilization of Three Mini- Pressurized Logistics Modules for the ISS Active (10/9/97) 8.) NASA-GOJ Agreement in Principle for CAM and Related Hardware Active (9/10/97) 9.) NASA-Brazilian Space Agency Implementing Arrangement for ISS Cooperation Active (10/14/97).

## RISK MITIGATION

**Risk Date: 10/17/2003**

| Top Risks | G | Overall | G | Cost | R | Schedule | G | Technical | Probability | Impact | Mitigation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R | Assembly sequence uncertainty until Shuttle returns to flight | | | | | | | | High | High | In place |

## INDEPENDENT REVIEWS

| Review Types | Performer | Last Review Date | Next Review Date | Purpose |
|---|---|---|---|---|
| None scheduled in FY 2005. | | | | |

## BUDGET/LIFE CYCLE COST

| Budget Authority ($ millions) | Prior | FY03 | FY04 | FY05 | FY06 | FY07 | FY08 | FY09 | BTC | Total | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FY2005 PRESBUD | 12,315.3 | 200.1 | 101.3 | 69.4 | 65.5 | 55.8 | 22.4 | 15.7 | | 12,845.5 | |
| Development | 12,315.3 | 200.1 | 101.3 | 69.4 | 65.5 | 55.8 | 22.4 | 15.7 | | 12,845.5 | |
| Changes since 2004 PRESBUD | -0.2 | -78.3 | -6.3 | +18.4 | +31.9 | -1.5 | -18.7 | +15.7 | | -39.2 | |
| Development | -0.2 | -78.3 | -6.3 | +18.4 | +31.9 | -1.5 | -18.7 | +15.7 | | -39.2 | |
| FY2004 PRESBUD | 12,315.5 | 278.4 | 107.6 | 51.0 | 33.6 | 57.3 | 41.1 | | | 12,884.6 | |
| Development | 12,315.5 | 278.4 | 107.6 | 51.0 | 33.6 | 57.3 | 41.1 | | | 12,884.6 | |
| Initial Baseline | 9,088.1 | | | | | | | | | 9,088.1 | |
| Flight Hardware | 7,139.0 | | | | | | | | | 7,139.0 | FY95 budget est |
| TMAS | 513.6 | | | | | | | | | 513.6 | FY95 budget est |
| Ops Cap Dev | 882.0 | | | | | | | | | 882.0 | FY95 budget est |
| Other (Trans Supt, Prog Spt, FTD) | 553.5 | | | | | | | | | 553.5 | FY95 budget est |

Indicates changes since the previous year's President's Budget Submit
Indicates budget numbers in full cost.

**Theme:** International Space Station
**Development:** ISS Capability Upgrades

## Purpose

| Objectives | Performance Measures |
|---|---|
| 8.4 | 5ISS2,5,8 |

ISS Capability Upgrades enable potential enhancements to accommodate research requirements. Expansion of crew size above the U.S. Core baseline is in formulation. Development of a regenerative environmental control and life support system (ECLSS), Node 3, and habitability modifications are expected to continue into FY 2005, based on the selection of a specific enhancement option in FY 2004.

## Overview

ECLSS and Node 3, managed by the Marshall Space Flight Center and reporting to the ISS Program, and Node 3, built by the Italian company, Alenia, are critical pacing items requiring funding to enable option paths to expand the ISS crew to greater than three after U.S. Core complete. They also provide critical life support dissimilar redundancy to the Russian life support system, Elektron Oxygen Generator. The FY 2005 budget includes funding to continue this effort. Funding beyond FY 2005 will be addressed once a final ISS configuration is determined.

## Program Management

The program management and reporting flows from the Program Manager, Bill Gerstenmaier, located at the Johnson Space Center (JSC), to the Deputy Associate Administrator (DAA) for ISS and SSP. The DAA for ISS and SSP reports directly to the Associate Administrator for Space Flight who reports directly to the NASA Administrator. The Agency Program Management Council (PMC) has ISS governing responsibility. Full compliance with NPG 7120.5B was achieved in FY 2003.

## Technical Commitment

Program Commitment Agreement signed August 19, 2003; Baseline was defined by May 2002 Cost Analysis Requirements Document (CARD).

| Technical Specifications | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| Node-3 Atmosphere | 14.7 psi | -- |
| Node-3 Length | 249 inches (20.75 ft) | -- |
| Node-3 Diameter | 175 Inches (14.6 ft) | -- |
| Node-3 Volume | 3470 cu ft. | -- |
| Node-3 Ports | Six (5 ACBM, 1 PCBM) | -- |
| Advanced ECLSS Dissimilar design | ECLSS redundancy(from Russian System); O2 Generation System - Up to 41K lbs of recycled Water; Water Recovery System - up to 7,500 lbs of O2 | -- |
| Advanced ECLSS Support Increased: | Crew size to 7 | -- |

| Schedule | FY 2005 President's Budget | Baseline | Change from Baseline |
|---|---|---|---|
| Advanced ECLSS Oxygen Generator Assembly | Systems Tests Complete 11/12/04 | 09/09/2004 | +2 Months |
| Advanced ECLSS Urine Processing Assembly | Rack Level Test Complete January 2005. | 08/10/2004 | +5 Months |
| Advanced ECLSS Water Processing Assembly | Rack 1 Systems Tests Complete 06/28/2004 | 03/25/2004 | +3 Months |
| Advanced ECLSS Water Recovery System | Systems Tests Complete 03/29/2005 | 01/05/2004 | +10 Months |
| Node-3 | Joint NASA/ASI Development Plan Baseline February 2004 | -- | -- |
| Node-3 | Delivery to Kennedy Space Center 01/2008 | -- | -- |
| Node-3 | TBD Shuttle Return to Flight | -- | -- |

## Acquisition Strategy and Performing Organizations

The Node 3/ECLSS project is being developed by a combination of international partners, NASA, and contractors. Alenia is building the Node 3 under contract with Italian Space Agency. Boeing under contract with NASA is providing critical software and hardware to Alenia. Advanced ECLSS is being developed by Marshall Space Flight Center. Major ECLSS orbital replacement unit development and rack level integration for two of three racks is being provided by Hamilton Sundstrand. Marshall Space Flight Center will provide total ECLSS integration.

**Theme:** International Space Station
**Development:** ISS Capability Upgrades

| Current Acquisition | Actual* | Selection Method | Actual* | Performer | Actual* |
|---|---|---|---|---|---|
| Cooperative Agreement | 0% | Full & Open Competition | 25% | Industry | 69% |
| Cost Reimbursable | 96% | Sole Source | 75% | Government | 31% |
| Fixed Price | 1% | | 100% | NASA Intramural | 0% |
| Grants | 0% | | | University | 0% |
| Other | 3% | Sci Peer Review | % | Non Profit | 0% |
| *As of FY 2003 direct procurement | 100% | *As of FY 2003 direct procurement | | *As of FY 2003 direct procurement | 100% |

| Future Acquisition - Major | Selection | Goals |
|---|---|---|
| None | | |

## Agreements

External: NASA/Italian Space Agency MOU on the Design, Development, and Delivery of Two Integrated Nodes (10/97).

## Risk Mitigation

**Risk Date: 10/17/2003**

| Top Risks | Y | Overall | Y | Cost | Y | Schedule | Y | Technical | Probability | Impact | Mitigation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | Orbital replacement unit life cycle test failures | | | | | | | | Medium | Medium | In Place |

## Independent Reviews

| Review Types | Performer | Last Review Date | Next Review Date | Purpose |
|---|---|---|---|---|
| ECLSS, Node 3, Habitation Mods Independent Cost Estimate | JSC Systems Management Office | 9/02 | 6/04 | Assessment of cost, schedule and technical risks. |

## Budget/Life Cycle Cost

| Budget Authority ($millions) | Prior | FY03 | FY04 | FY05 | FY06 | FY07 | FY08 | FY09 | BTC | Total | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FY2005 PRESBUD | 633.9 | 31.8 | 45.5 | 29.6 | 16.0 | 9.8 | 3.9 | 0.8 | | 771.3 | |
| ECLSS | 183.4 | 22.6 | 19.3 | 11.2 | 9.3 | 3.7 | | | | 249.5 | |
| Node 3 | 8.3 | 9.2 | 26.2 | 18.4 | 6.7 | 6.1 | 3.9 | 0.8 | | 79.6 | |
| CRV | 171.8 | | | | | | | | | 171.8 | |
| RPA | 270.4 | | | | | | | | | 270.4 | |
| Changes since 2004 PRESBUD | -13.0 | | -0.3 | +2.5 | -4.4 | -0.1 | +3.9 | +0.8 | | -10.6 | |
| ECLSS | -0.6 | +0.6 | -0.1 | +5.5 | +5.4 | +2.8 | | | | +13.6 | |
| Node 3 | | -0.6 | -0.2 | -3.0 | -9.7 | -2.9 | +3.9 | +0.8 | | -11.8 | |
| CRV | -12.4 | | | | | | | | | -12.4 | |
| FY2004 PRESBUD | 646.9 | 31.8 | 45.8 | 27.1 | 20.4 | 9.9 | | | | 781.9 | |
| ECLSS | 184.0 | 22.0 | 19.4 | 5.7 | 3.9 | 0.9 | | | | 235.9 | |
| Node 3 | 8.3 | 9.8 | 26.4 | 21.4 | 16.4 | 9.0 | | | | 91.3 | |
| CRV | 184.2 | | | | | | | | | 184.2 | |
| RPA | 270.4 | | | | | | | | | 270.4 | |
| Initial Baseline | 1,487.3 | 202.3 | 195.0 | 15.4 | 10.5 | 7.7 | | | | 1,918.2 | |
| ECLSS (Nov-02) | 183.4 | 22.5 | 12.3 | 1.0 | | | | | | 219.2 | 02 PMR est., dev. only |
| Node 3 (Nov-02) | 8.3 | 9.8 | 16.7 | 14.4 | 10.5 | 7.7 | | | | 67.4 | 02 PMR est., dev. only |
| CRV (Jan-98) | 461.0 | 165.0 | 166.0 | | | | | | | 792.0 | FY99 budget est |
| RPA (Jan-99) | 834.6 | 5.0 | | | | | | | | 839.6 | FY00 budget est |

Indicates changes since the previous year's President's Budget Submit
Indicates budget numbers in full cost.

**Theme:** International Space Station
**Operations:** Spacecraft Operations

## PURPOSE

| Objectives | Performance Measures |
|---|---|
| 3.1, 8.4, 9.3 | 5ISS1-2,6,9 |

The primary objective of the Spacecraft Operations Program is to safely and reliably assemble, activate, integrate, and operate the ISS on-orbit, and to perform these activities in an affordable manner. This requires a significant level of planning, coordination, and execution. Spacecraft Operations provides the engineering expertise and analysis to sustain the performance and reliability of Space Station hardware and software systems, spares provisioning, and maintenance and repair as detailed in the budget table.

## OVERVIEW

The first ISS crew was launched in October 2000 and a series of international crews now permanently inhabit the Station. The ISS assembly period spans more than half a decade, with infrastructure and logistics deployed over multiple flights. Because of the program's complexity, the Space Station team has done extensive planning for operations of several different ISS vehicle configurations on-orbit. The Space Station program is drawing on the experience derived from Skylab, the Shuttle-Mir program, and that gained from operating the Space Shuttle for nearly two decades to address the unique circumstances of building and operating an ever-changing vehicle. Engineering for sustaining and supporting the flight hardware and software, crew systems and maintenance, and EVA systems, is consolidated and performed at the Johnson Space Center, with support from the Marshall Space Flight Center for pressurized modules and environmental control subsystems. Flight hardware spares and repair costs continue to be controlled by maintenance and repair capabilities, including hardware depots that effectively utilize the Kennedy Space Center, and original equipment manufacturers or other certified industry repair resources.

## PROGRAM MANAGEMENT

The program management and reporting flows from the Program Manager, Bill Gerstenmaier, located at the Johnson Space Center, to the Deputy Associate Administrator (DAA) for ISS and SSP. The DAA for ISS & SSP reports directly to the Associate Administrator for Space Flight who reports directly to the NASA Administrator. The Agency Program Management Council (PMC) has ISS oversight responsibility. Full compliance with NPG 7120.5B was achieved in FY 2003.

## TECHNICAL COMMITMENT

Program Commitment Agreement signed August 19, 2003. Baseline was defined by May 2002 Cost Analysis Requirements Document (CARD).

| Technical Specifications | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| Operational Life | Nominal operations and utilization lifetime to 2015, and a one - year decommissioning period. | -- |
| Shuttle Logistical Flights | Five per year. | -- |
| Power to User Payloads | 26 kW minimum continuous power and 30 kW annual average after U.S. Core Complete. | -- |
| Microgravity Crew Time | At least 180 days annually (four periods greater than 30 days). | -- |
| Spacecraft | Each flight increment nominally planned for 180 days on-orbit. Maintain and sustain U.S. flight and ground hardware and software to ensure integrity of the ISS design and the completion of research. | -- |

| Schedule | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| 9A - S1 Truss | Launched October 2002 | +2 Months |
| 11A - P1 Truss | Launched November 2002 | +2 months |
| 12A - P3/P4 Truss Segments | Feb 2005 | -- |
| 12A.1 - P5 Truss | Apr 2005 | -- |
| 13A - S3/S4 Truss Segments | Jun 2005 | +21 months |
| 13A.1 - S5 Truss | Sep 2005 | +24 months |
| 15A - S6 Truss Segment | Oct 2005 | +22 months |
| 10A - S6 Truss - U.S. Core Complete | Feb 2006 | +24 months |

**Theme:** International Space Station
**Operations:** Spacecraft Operations

## ACQUISITION STRATEGY AND PERFORMING ORGANIZATIONS

The Prime Contractor for design, development, test, and evaluation of major elements of U.S. Flight Hardware and Engineering Support for the integration of the entire Space Station is Boeing Aerospace. . The prime contract which covers development and operations has been extended through September 2006. In FY 2003, direct procurements from Boeing represented about 37% of budget authority in development and operations. Changes since FY04 Pres. Budget: None

| Current Acquisition | Actual* | Selection Method | Actual* | Performer | Actual* |
|---|---|---|---|---|---|
| Cooperative Agreement | 0% | Full & Open Competition | 14% | Industry | 99% |
| Cost Reimbursable | 93% | Sole Source | 86% | Government | 0% |
| Fixed Price | 5% | | | NASA Intramural | 0% |
| Grants | 0% | | 100% | University | 0% |
| Other | 2% | Sci Peer Review | % | Non Profit | 1% |
| *As of FY 2003 direct procurement | 100% | *As of FY 2003 direct procurement | | *As of FY 2003 direct procurement | 100% |

| Future Acquisition - Major | Selection | Goals |
|---|---|---|
| 1. Contract restructuring | Start Oct '03 | 25% Full & Open Competition; 100% Cost Reimbursable |

## AGREEMENTS

External: 1.) Intergovernmental Agreement (IGA) Active (1/29/98) 2.) NASA/RSA Memorandum of Understanding (MOU) Active (1/29/98) 3.) NASA/ESA MOU Active (1/29/98) 4.) NASA/GOJ MOU Active (2/24/98) 5.) NASA/CSA MOU Active (1/29/98) 6.) NASA/ESA Early Utilization Agreement Active (3/18/97) 7.) NASA/Italian Space Agency (ASI) MOU on the Design, Development, Operation, and Utilization of Three Mini- Pressurized Logistics Modules for the ISS Active (10/9/97) 8.) NASA-GOJ Agreement in Principle for CAM and Related Hardware Active (9/10/97) 9.) NASA-Brazilian Space Agency Implementing Arrangement for ISS Cooperation Active (10/14/97).

## RISK MITIGATION

**Risk Date: 10/17/2003**

| Top Risks | G | Overall | G | Cost | Y | Schedule | G | Technical | Probability | Impact | Mitigation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R | Internal Active Thermal Control System coolant impact to system integrity | | | | | | | | Medium | Medium | In Place |
| R | Control Moment Gyroscope issues | | | | | | | | Medium | Medium | In Place |

## INDEPENDENT REVIEWS

| Review Types | Performer | Last Review Date | Next Review Date | Purpose |
|---|---|---|---|---|
| None scheduled for FY 2005. | | | | |

**Theme:** International Space Station
**Operations:** Spacecraft Operations

## BUDGET

| Budget Authority ($ millions) | FY03 | FY04 | FY05 | Comments |
|---|---|---|---|---|
| FY2005 PRESBUD | 658.6 | 710.2 | 812.0 | |
| ISS Spacecraft Management .. | 91.9 | 133.2 | 245.0 | |
| ISS Elements .. | 76.9 | 26.6 | 32.9 | |
| Flight Systems .. | 110.1 | 143.5 | 93.4 | |
| Avionics Systems .. | 53.0 | 56.2 | 51.2 | |
| Crew Systems .. | 12.9 | 14.1 | 10.6 | |
| Extra-Vehicular Activity Systems. | 72.2 | 46.1 | 124.2 | |
| Flight Software .. | 33.1 | 148.4 | 126.9 | |
| Logistics & Maintenance | 208.6 | 142.1 | 124.1 | |
| Crew Transfer Vehicle | | | 3.7 | |
| Changes since 2004 PRESBUD | -51.8 | -126.4 | | |
| ISS Spacecraft Management | -55.5 | -101.6 | | |
| ISS Elements | +15.2 | -1.4 | | |
| Flight Systems | -1.1 | -5.6 | | |
| Avionics Systems | +2.0 | -2.3 | | |
| Crew Systems | +0.9 | -0.5 | | |
| Extra-Vehicular Activity Systems | +34.3 | -2.8 | | |
| Flight Software | -97.7 | -6.0 | | |
| Logistics & Maintenance | +50.1 | -6.2 | | |
| FY2004 PRESBUD | 710.4 | 836.6 | | |
| ISS Spacecraft Management | 147.4 | 234.8 | | |
| ISS Elements | 61.7 | 28.0 | | |
| Flight Systems | 111.2 | 149.1 | | |
| Avionics Systems. | 51.0 | 58.5 | | |
| Crew Systems | 11.9 | 14.6 | | |
| Extra-Vehicular Activity Systems | 37.9 | 48.9 | | |
| Flight Software | 130.8 | 154.4 | | |
| Logistics & Maintenance | 158.4 | 148.3 | | |

Indicates changes since the previous year's President's Budget Submit
Indicates budget numbers in full cost.

**Theme:** International Space Station

**Operations:** Launch and Mission Operations

## PURPOSE

| Objectives | Performance Measures |
|---|---|
| 8.4 | 5ISS2,4,9 |

Launch and Mission Operations provides training, mission control operations, operations engineering support, operations planning and cargo integration, medical support, and launch site processing for the International Space Station.

## OVERVIEW

The first crew was launched to the ISS in October 2000 and international crews have continued, to inhabit the ISS ever since. The ISS assembly period spans more than half a decade, with infrastructure and logistics deployed over multiple flights. Because of the program's complexity, the Space Station team performs extensive planning for operations for several different ISS vehicle configurations on-orbit. Each time an element is added to the current Station, the flight characteristics and internal systems change, creating different thermal constraints and orbital characteristics.

The Mission Control Center-Houston at Johnson Space Center is the prime site for the planning and execution of integrated system operations of the Space Station. Communication links from Houston and from Mission Control Center-Moscow support control activities, using the Tracking and Data Relay Satellite system (TDRSS) system and Russian communication assets. Crewmembers are trained in the Neutral Buoyancy Lab and Space Station Training Facility on systems, operations, and activities expected during a mission. Engineering support provides ground facility requirements and test support, ground display and limited applications development, resource planning, photo/TV training, medical operations tasks, and mission execution and systems performance assessment. Launch site processing at KSC includes requirement definition and processing planning, post delivery inspection/verification, servicing, interface testing, integrated testing, close-outs, weight and center of gravity measurement, and rack/component to carrier installation.

## PROGRAM MANAGEMENT

The program management and reporting flows from the Program Manager, Bill Gerstenmaier, located at the Johnson Space Center, to the Deputy Associate Administrator (DAA) for ISS and SSP. The DAA for ISS & SSP reports directly to the Associate Administrator for Space Flight who reports directly to the NASA Administrator. The Agency Program Management Council (PMC) has ISS oversight responsibility. Full compliance with NPG 7120.5B was achieved in FY 2003.

## TECHNICAL COMMITMENT

Program Commitment Agreement signed August 19, 2003. Baseline was defined by May 2002 Cost Analysis Requirements Document (CARD).

| Technical Specifications | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| Operational Life | Nominal operations and utilization lifetime to 2015, and a one - year decommissioning period. | -- |
| Shuttle Logistical Flights | Five per year. | -- |
| Power to User Payloads | 26 kW minimum continuous power and 30 kW annual average after U.S. Core Complete. | -- |
| Microgravity | At least 180 days annually (four periods greater than 30 days). | -- |
| Crew Time | Each flight increment nominally planned for 180 days on-orbit. | -- |
| Spacecraft | Maintain and sustain U.S. flight and ground hardware and software to ensure integrity of the ISS design and the continuous, safe operability of the vehicle. | -- |
| Integration and Operations | Operational and mission planning, coordination, training, and real-time support to ensure flight readiness and mission success. | -- |

| Schedule | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| 9A - S1 Truss | Launched October 2002 | +2 Months |
| 11A - P1 Truss | Launched November 2002 | +2 months |
| 12A - P3/P4 Truss Segments | Feb 2005 | 0 months |
| 12A.1 - P5 Truss | Apr 2005 | 0 months |
| 13A - S3/S4 Truss Segments | Jun 2005 | +21 months |
| 13A.1 - S5 Truss | Sep 2005 | +24 months |
| 15A - S6 Truss | Oct 2005 | +22 months |
| 10A - Node 2 - U.S. Core Complete | Feb 2006 | +24 months |

**Theme:** International Space Station
**Operations:** Launch and Mission Operations

## Acquisition Strategy and Performing Organizations

The Prime Contractor for design, development, test and evaluation of major elements of U.S. Flight Hardware and Engineering Support for the integration of the Space Station is Boeing Aerospace. The prime contract which covers development and operations has been extended through September 2006. In FY 2003, direct procurements from Boeing represented about 37% of budget authority in development and operations. Changes since FY04 President's Budget: None

| Current Acquisition | Actual* | Selection Method | Actual* | Performer | Actual* |
|---|---|---|---|---|---|
| Cooperative Agreement | 0% | Full & Open Competition | 50% | Industry | 100% |
| Cost Reimbursable | 97% | Sole Source | 50% | Government | 0% |
| Fixed Price | 2% | | | NASA Intramural | 0% |
| Grants | 0% | | 100% | University | 0% |
| Other | 1% | Sci Peer Review | 0% | Non Profit | 0% |
| *As of FY 2003 direct procurement | 100% | *As of FY 2003 direct procurement | | *As of FY 2003 direct procurement | 100% |

| Future Acquisition - Major | Selection | Goals |
|---|---|---|
| 1. Contract restructuring | Start Oct '03 | TBD Full and Open Competition; TBD Cost Reimbursable; |

## Agreements

External: 1.) Intergovernmental Agreement (IGA) Active (1/29/98) 2.) NASA/RSA Memorandum of Understanding (MOU) Active (1/29/98) 3.) NASA/ESA MOU Active (1/29/98) 4.) NASA/GOJ MOU Active (2/24/98) 5.) NASA/CSA MOU Active (1/29/98) 6.) NASA/ESA Early Utilization Agreement Active (3/18/97) 7.) NASA/Italian Space Agency (ASI) MOU on the Design, Development, Operation, and Utilization of Three Mini- Pressurized Logistics Modules for the ISS Active (10/9/97) 8.) NASA-GOJ Agreement in Principle for CAM and Related Hardware Active (9/10/97) 9.) NASA-Brazilian Space Agency Implementing Arrangement for ISS Cooperation Active (10/14/97).

## Risk Mitigation

| Top Risks | G | Overall | G | Cost | Y | Schedule | G | Technical | Probability | Impact | Mitigation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R | ISS supporting Ground Operations until Shuttle returns to flight | | | | | | | | High | Medium | In Place |

## Budget/Life Cycle Cost

| Budget Authority ($ millions) | FY 2003 | FY 2004 | FY 2005 | Comments |
|---|---|---|---|---|
| FY2005 PRESBUD | 289.6 | 439.9 | 458.3 | |
| Mission Integration | 52.9 | 103.1 | 108.7 | |
| Medical Support | 13.9 | 18.5 | 22.5 | |
| Mission | 163.4 | 201.6 | 198.8 | |
| Launch Site Processing | 59.4 | 116.7 | 128.3 | |
| Changes since 2004 PRESBUD | +86.8 | -52.6 | | |
| Mission Integration | +11.4 | -36.5 | | |
| Medical Support | -0.4 | -1.0 | | |
| Mission | +74.6 | -9.3 | | |
| Launch Site Processing | +1.1 | -5.8 | | |
| FY2004 PRESBUD | 202.8 | 492.5 | | |
| Mission Integration | 41.5 | 139.6 | | |
| Medical Support | 14.2 | 19.5 | | |
| Mission | 88.8 | 210.9 | | |
| Launch Site Processing | 58.3 | 122.5 | | |

Indicates changes since the previous year's President's Budget Submit

Indicates budget numbers in full cost.

**Theme:** International Space Station

**Operations:** Operations Program Integration

## PURPOSE

| Objectives | Performance Measures |
|---|---|
| 8.4 | 5ISS5,9 |

Operations Program Integration provides the overall ISS program management functions, system engineering, analysis and integration, information technology, and safety and mission assurance activities.

## OVERVIEW

Program integration is a continuous effort managing and coordinating program and international activities, and evaluating the technical performance of the flight, avionics and crew systems, and the necessary logistical systems required to support the on-orbit vehicle and crew. This is especially critical as the vehicle undergoes significant configuration changes as each of the final elements is assembled. Program management activities are centered at JSC and include contractor and government business management functions, international partner integration, configuration management and data integration, management information systems, and enterprise support. System engineering and integration responsibilities include requirements and interface documentation, integrated systems and performance analysis, assembly and configuration definition and analysis, and Shuttle/Station integration. Safe program operations remain a top priority, and safety and mission assurance functions provide for risk management, quality assurance, and reliability and maintainability activities, as well as overall safety and mission assurance integration and operations.

## PROGRAM MANAGEMENT

The program management and reporting flows from the Program Manager, Bill Gerstenmaier, located at the Johnson Space Center, to the Deputy Associate Administrator (DAA) for ISS and SSP. The DAA for ISS & SSP reports directly to the Associate Administrator for Space Flight who reports directly to the NASA Administrator. The Agency Program Management Council (PMC) has ISS oversight responsibility. Full compliance with NPG 7120.5B was achieved in FY 2003.

## TECHNICAL COMMITMENT

Program Commitment Agreement signed August 19, 2003. Baseline was defined by May 2002 Cost Analysis Requirements Document (CARD).

| Technical Specifications | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| Operational Life | Nominal operations and utilization lifetime to 2015, and a one - year decommissioning period. | -- |
| Shuttle Logistical Flights | Five per Year. | -- |
| Power to User Payloads | 26 kW minimum continuous power and 30 kW annual average after U.S. Core Complete. | -- |
| MicroGravity | At least 180 days annually (four periods greater than 30 days). | -- |
| Crew Time | Each flight increment nominally planned for 180 days on-orbit. | -- |
| Spacecraft | Maintain and sustain U.S. flight and ground hardware and software to ensure integrity of the ISS design and the continuous, safe operability of the vehicle. | -- |
| Integration and Operations | Operational and mission planning, coordination, training, and real-time support to ensure flight readiness and mission success. | -- |

| Schedule | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| 9A - S 1 Truss | Launched October 2002 | +2 Months |
| 11A - P1 Truss | Launched November 2002 | +2 Months |
| 12A - P3/P4 Truss Segments | Feb 2005 | +0 months |
| 12A.1 - P5 Truss | Apr 2005 | 0 months |
| 13A - S3/S4 Truss Segments | Jun 2005 | +21 months |
| 13A.1 - S5 Truss | Sep 2005 | +24 months |
| 15A - S6 Truss | Oct 2005 | +22 months |
| 10A - Node 2 - U.S. Core Complete | Feb 2006 | +24 months |

**Theme:** International Space Station
**Operations:** Operations Program Integration

## Acquisition Strategy and Performing Organizations

The Prime Contractor for design, development, test and evaluation of major elements of U.S. Flight Hardware and Engineering Support for the integration of the entire Space Station is Boeing Aerospace. The prime contract which covers development and operations has been extended through September 2006. In FY2003, direct procurements from Boeing represented about 37% of budget authority in development and operations. Changes since FY04 President's Budget: None

| Current Acquisition | Actual* | Selection Method | Actual* | Performer | Actual* |
|---|---|---|---|---|---|
| Cooperative Agreement | 0% | Full & Open Competition | 34% | Industry | 100% |
| Cost Reimbursable | 77% | Sole Source | 66% | Government | 0% |
| Fixed Price | 7% | | | NASA Intramural | 0% |
| Grants | 0% | | 100% | University | 0% |
| Other | 16% | Sci Peer Review | % | Non Profit | 0% |
| *As of FY 2003 direct procurement | 100% | *As of FY 2003 direct procurement | | *As of FY 2003 direct procurement | 100% |

| Future Acquisition | Selection | Goals |
|---|---|---|
| 1. Contract restructuring | Start Oct '03 | TBD Full and Open Competition; TBD Cost Reimbursable; |

## Agreements

External: 1.) Intergovernmental Agreement (IGA) Active (1/29/98) 2.) NASA/RSA Memorandum of Understanding (MOU) Active (1/29/98) 3.) NASA/ESA MOU Active (1/29/98) 4.) NASA/GOJ MOU Active (2/24/98) 5.) NASA/CSA MOU Active (1/29/98) 6.) NASA/ESA Early Utilization Agreement Active (3/18/97) 7.) NASA/Italian Space Agency (ASI) MOU on the Design, Development, Operation, and Utilization of Three Mini- Pressurized Logistics Modules for the ISS Active (10/9/97) 8.) NASA-GOJ Agreement in Principle for CAM and Related Hardware Active (9/10/97) 9.) NASA-Brazilian Space Agency Implementing Arrangement for ISS Cooperation Active (10/14/97).

## Risk Mitigation

**Risk Date: 10/17/2003**

| Top Risks | G | Overall | Y | Cost | Y | Schedule | G | Technical | Probability | Impact | Mitigation Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R | Ability to support high priority research until Shuttle return to flight | | | | | | | | Medium | High | In place |

## Independent Reviews

| Review Types | Performer | Last Review Date | Next Review Date | Purpose |
|---|---|---|---|---|
| None scheduled in FY 2005 | | | | |

## Budget

| Budget Authority ($ millions) | FY 2003 | FY 2004 | FY 2005 | Comments |
|---|---|---|---|---|
| FY2005 PRESBUD | 282.3 | 201.2 | 353.4 | |
| Ops Program Management | 227.5 | 161.2 | 279.4 | |
| Ops System Eng'g, Analysis & Integration | 25.3 | 18.7 | 30.0 | |
| Ops Safety & Mission Assurance | 29.6 | 21.3 | 44.0 | |
| Changes since 2004 PRESBUD | +13.6 | -23.3 | | |
| Ops Program Management | -2.6 | -20.0 | | |
| Ops System Eng'g, Analysis & Integration | +6.5 | -1.4 | | |
| Ops Safety & Mission Assurance | +9.7 | -1.9 | | |
| FY2004 PRESBUD | 268.7 | 224.5 | | |
| Ops Program Management | 230.1 | 181.2 | | |
| Ops System Eng'g, Analysis & Integration | 18.7 | 20.1 | | |
| Ops Safety & Mission Assurance | 19.9 | 23.2 | | |

Indicates changes since the previous year's President's Budget Submit
Indicates budget numbers in full cost.

## **Theme:** International Space Station
## **Operations:** ISS Cargo/Crew Services

### PURPOSE

| Objectives | Performance Measures |
|---|---|
| 8.1 | 5ISS7,9 |

The objectives of the ISS Cargo/Crew Services are the purchase of launch, delivery, and earth return services for ISS cargo including the replacement of failed orbital replacement units, the replenishment of research materials and products, and the purchase of human-rated launch, delivery, and return capability for expedition crew rotation.

### OVERVIEW

The Space Shuttle has been the primary U.S. transportation vehicle for assembly and operation of the Space station since 1998 when STS88 delivered and mated the Unity node to the Russian Control module, Zarya. NASA plans to continue use of the Space Shuttle as the workhorse vehicle for transporting large cargo to complete the assembly of the space station by the end of this decade. At that point, the Shuttle fleet will be retired. New U.S. vehicles with potential capability to support the ISS are not planned for operation before 2014. It is necessary for NASA to establish a transportation capability for crew and cargo for the space station program after the Shuttle is retired. NASA intends to meet this need through the purchase of services for cargo and crew transport using existing and emerging capabilities, both domestic and foreign. In the near term, the purchase of these services is necessary to enable new ISS science capabilities, deliver and retrieve cargo, and provide human-rated crew transport for enterprise crew rotation when the Shuttle and partner-provided transportation is insufficient to meet space station requirements.

### PROGRAM MANAGEMENT

The program management and reporting flows from the Program Manager, Bill Gerstenmaier, located at the Johnson Space Center, to the Deputy Associate Administrator (DAA) for ISS and SSP. The DAA for ISS & SSP reports directly to the Associate Administrator for Space Flight who reports directly to the NASA Administrator. The Agency Program Management Council (PMC) has ISS oversight responsibility.

### TECHNICAL COMMITMENT

Program Commitment Agreement (PCA) planned to be signed in FY2004.

| Technical Specifications | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| Operational Life | Nominal operations and utilization lifetime to 2016. | -- |
| Cargo Delivery Flights | TBD | -- |
| Cargo Return Flights | TBD | -- |
| Crew Delivery Flights | TBD | -- |
| Crew Return Flights | TBD | -- |

| Schedule | FY 2005 President's Budget | Change from Baseline |
|---|---|---|
| Cargo Delivery Flights | TBD | -- |
| Cargo Return Flights | TBD | -- |
| Crew Delivery Flights | TBD | -- |
| Crew Return Flights | TBD | -- |

### ACQUISITION STRATEGY AND PERFORMING ORGANIZATIONS

To Be Developed.

| Current Acquisition | Actual* | Selection Method | Actual* | Performer | Actual* |
|---|---|---|---|---|---|
| Cooperative Agreement | 0% | Full & Open Competition | TBD | Industry | TBD |
| Cost Reimbursable | TBD | Sole Source | 0% | Government | 0% |
| Fixed Price | 0% | | | NASA Intramural | 0% |
| Grants | 0% | | 100% | University | 0% |
| Other | 0% | Sci Peer Review | 0% | Non Profit | 0% |
| *As of FY 2003 direct procurement | | *As of FY 2003 direct procurement | | *As of FY 2003 direct procurement | |

**Theme:** International Space Station
**Operations:** ISS Cargo/Crew Services

| Future Acquisition | Selection | Goals |
|---|---|---|
| To be determined | | |

## AGREEMENTS

External: 1. Intergovernmental Agreement (IGA) Active (1/29/98); 2. NASA/RSA Memorandum of Understanding (MOU) Active (1/29/98); 3. NASA/European Space Agency (ESA) MOU Active ( 1/29/98); 4. NASA/Government of Japan (GOJ) MOU Active (2/24/98); 5. NASA/Canadian Space Agency (CSA) MOU Active (1/29/98); 6. NASA/ESA Early Utilization Agreement Active ( 3/18/97); 7. NASA/Italian Space Agency (ASI) MOU on the Design, Development, Operation, and Utilization of Three Mini- Pressurized Logistics Modules for the ISS Active (10/9/97); 8. NASA-GOJ Agreement in Principle for CAM and Related Hardware Active ( 9/10/97); and 9. NASA-Brazilian Space Agency Implementing Arrangement for ISS Cooperation Active (10/14/97).

## INDEPENDENT REVIEWS

| Review Types | Performer | Last Review Date | Next Review Date | Purpose |
|---|---|---|---|---|
| TBD | | | | |

## BUDGET

| Budget Authority ($ millions) | F Y 2003 | FY 2004 | FY 2005 | Comments |
|---|---|---|---|---|
| FY2005 PRESBUD | | | 140.0 | |
| ISS Cargo/Crew Services | | | 140.0 | |
| Changes since 2004 PRESBUD | | | | |
| FY2004 PRESBUD | | | | |

Indicates changes since the previous year’s President’s Budget Submit
Indicates budget numbers in full cost.