



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

Space Shuttle

MAJOR EVENTS IN FY 2005

- ☒ Continuance of Space Station assembly missions;
- ☒ Completion of the Space Shuttle Main Engine Advanced Health Management System; and
- ☒ Preparation for the planned phase out of the Space Shuttle at the end of the decade following completion of its role in Space Station assembly.

Theme: Space Shuttle

OVERVIEW

The Space Shuttle program (SSP) plays a vital role in enabling NASA's vision and mission. This includes advancing human exploration and providing safe access to space in support of human operations in low Earth orbit. The Shuttle's primary role is to complete the assembly of the International Space Station (ISS). The Shuttle's phase out is planned for the end of the decade, following completion of its role in ISS assembly. The FY 2005 budget request will allow NASA to meet the intended flight rates; provide appropriate contingency planning to assure transportation and assembly support to the International Space Station (ISS); and include high priority projects for mission assurance.

Missions	Goals supported by this Theme	Objectives supporting those Goals
Exploration Capabilities	8. Ensure the provision of space access, and improve it by increasing safety, reliability, and affordability.	8.3 Improve the accessibility of space via the Space Shuttle to better meet Space Station assembly, operations and research requirements.

RELEVANCE

In 1972 President Nixon issued a statement to initiate the "development of an entirely new type of space transportation system designed to help transform the space frontier of the 1970s into familiar territory, easily accessible for human endeavor in the 1980s and '90s." The Space Shuttle is essential to the assembly of the ISS, its primary mission before its planned phase out at the end of the decade.

Education and Public Benefits

The SSP provides Long-term benefits to the public through support to the ISS and enables researchers to undertake experiments in the unique environment of space. The SSP is contributing to NASA's goal to get students excited about science and mathematics and help advance the Nation's education goals by supporting the Educator Astronaut Program.

IMPLEMENTATION

This Theme is composed of many integrated parts that work together to achieve the aforementioned goals and objectives. Those elements are summarized below. Selected Development efforts have individual follow-on information sheets, as do Operations. SSP is a multiple-project program and single-program Theme with program responsibility in the Space Flight Enterprise at NASA Headquarters. The Agency Program Management Council has SSP governing responsibility. Enterprise official is William F. Readdy, Associate Administrator for Space Flight at NASA Headquarters. Theme Director is General Michael C. Kostelnik, Deputy Associate Administrator for ISS and SSP.

IMPLEMENTATION SCHEDULE

Theme Element	Schedule by Fiscal Year											Purpose					
	95	96	97	98	99	00	01	02	03	04	05		06	07	08	09	10
SSME Advanced Health Management System (AHMS)																	Provides improved real-time monitoring of engine performance and environmental data.
Cockpit Avionics Upgrade																	Increases crew performance margins throughout all critical flight operations phases.
Program Integration																	Ensures the proper technical integration of all Shuttle elements and payloads. Includes high-priority mission assurance projects for safety, supportability, and infrastructure to combat obsolescence of vehicle, ground systems, and facilities.
Ground Operations																	Provides final integration and checkout of all hardware elements for launch.
Flight Operations																	Includes a wide variety of pre-flight planning, crew training, operations control activities, flight crew operations support, aircraft maintenance and operations and life sciences operations support.
Flight Hardware																	Produces and maintains the various flight hardware and software elements.

Tech & Adv Concept
 Development
 Operations
 Research

No exceptions to NPG 7120.5B have been taken.

STATUS

Although the STS-107 Space Shuttle mission ended tragically, all 80 of the experiments onboard studying Earth and space science, advanced technology development, and astronaut health and safety were conducted successfully. More than 50 percent of this research was recovered. The Shuttle program has established an Implementation Plan for Return to Flight and Beyond to address all the actions necessary to comply with the formal recommendations of the Columbia Accident Investigation Board (CAIB) and to assure a safe return to flight as soon as practicable. Before the Columbia accident, the Space Shuttle program successfully completed two other missions in FY 2003. The STS-112 mission delivered the first

Theme: Space Shuttle

starboard truss segment to the ISS. In addition to performing a crew exchange, the STS-113 mission delivered the first truss segment on the left side of the ISS. Three spacewalks were performed on each of these missions. The Program Assessment Rating Tool (PART) evaluation concluded "Results Not Demonstrated" due to the loss of the Space Shuttle Columbia, and also due to the lack of good short and long-term measures. To improve the next PART evaluation, additional measures will be added. Go to <http://spaceflight.nasa.gov/> for more detailed status information.

PERFORMANCE MEASURES

Outcomes/Annual Performance Goals (APGs)	
Outcome 8.3.1	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.
5SSP1	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 three or more persons) mishaps in FY 2005
5SSP2	Achieve an average of eight or fewer flight anomalies per Space Shuttle mission in FY 2005
5SSP3	Achieve 100 percent on-orbit mission success for all Shuttle missions launched in FY 2005. For this metric, mission success criteria are those provided to the prime contractor (SFOC) for purposes of determining successful accomplishment of the performance incentive fees in the contract.
Uniform Measures	
5SSP4	Complete all development projects within 110% of the cost and schedule baseline.
5SSP5	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
Observation	Office of Inspector General	12/03		Assess independence of CAIB.
Mishap Investigation	CAIB	8/03		Determine cause of Columbia accident and provide recommendations.
Audit	OIG	8/03		Survey RTF activities, identify weaknesses and ensure they are addressed.
Return to Flight Review	Return to Flight Task Group (Stafford - Covey)	On going	On going	Assess NASA's actions to implement recommendations of the CAIB.

BUDGET

Budget Authority (\$ millions)	FY 2003	FY 2004	Change	FY 2005	Comments
Space Shuttle	3,301.4	3,945.0	+374.2	4,319.2	
<u>Development</u>	<u>96.8</u>	<u>96.3</u>	<u>-9.1</u>	<u>87.2</u>	
Checkout and Launch Control System (CLCS)	13.1				
Advanced Health Management System (AHMS)	4.9	6.3	-3.0	3.3	
Cockpit Avionics Upgrade (CAU)	78.8	90.0	-6.1	83.9	
<u>Operations</u>	<u>3,204.6</u>	<u>3,848.7</u>	<u>+383.3</u>	<u>4,232.0</u>	Increase for Return to Flight
Program Integration	503.4	609.8	+183.2	793.0	
Ground Operations	568.9	894.2	+161.3	1,055.5	
Flight Operations	267.9	373.2	+32.2	405.4	
Flight Hardware	1,705.2	1,971.5	+6.6	1,978.1	
Service Life Extension Program (SLEP)	159.3				

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

Indicates budget numbers in full cost.

Theme: Space Shuttle

Development: Advanced Health Management System (AHMS)

PURPOSE

Objectives	Performance Measures
8.3	5SSP1,4

AHMS project supports this objective by enabling safe Space Shuttle Main Engine shutdown during potentially catastrophic high pressure turbopump failures which decreases ascent risk by approximately ten percent.

OVERVIEW

The AHMS project for the Space Shuttle Main Engines (SSME) will provide improved real-time vibration monitoring of the SSME and will provide improved engine anomaly response capabilities. AHMS consists of modifications to the existing SSME flight controller. These modifications include: 1) adding a vibration redline monitor for high pressure turbopumps, 2) doubling memory capacity and utilizing radiation tolerant memory, 3) adding an external communication interface for a potential Phase 2 Health Management Computer, and 4) eliminating existing memory retention batteries and replacing them with non-volatile memory. This project funds these modifications and the testing necessary to validate their performance and safety benefits to the Space Shuttle program.

PROGRAM MANAGEMENT

AHMS is a project with program level responsibility delegated to the Johnson Space Center. Marshall Space Flight Center, Stennis Space Center, and Kennedy Space Center also have critical roles in the realization of this program. The prime Contractor is Boeing-Rocketdyne. The Space Flight Enterprise Program Management Council has SSP governing responsibility. The Enterprise official is William F. Readdy, Associate Administrator for Space Flight at HQ. The Point of Contact is General Michael C. Kostelnik, Deputy Associate Administrator for ISS and SSP at HQ. The Project Manager is Jeffrey Spencer at Marshall. Full compliance with NPG 7120.5B will be achieved in FY 2004.

TECHNICAL COMMITMENT

The baseline for this technical commitment was made in June 1997. This project was rebaselined in August 2003 to account for impacts resulting from external factors (Columbia accident).

Technical Specifications	FY 2005 President's Budget	Change from Baseline
Digital Computer Unit Memory	128K	+64
Baseline Controller Weight Delta	+3 lb	0
Time to initiate engine shutdown after vibration redline exceedance	125 ms	0

Schedule	FY 2005 President's Budget	Baseline	Change from Baseline
Phase I Critical Design Review	May-01	May-01	Complete
Phase I Design Certification Review	Jun-04	Jun-04	0
Phase I Ready for First Flight	Oct-04	Oct-04	0

ACQUISITION STRATEGY AND PERFORMING ORGANIZATIONS

Boeing-Rocketdyne has a cost plus award fee/incentive fee contract to develop this project. Changes since FY 2004 President's Budget: None.

Current Acquisition	Actual*	Selection Method	Actual*	Performer	Actual*
Cooperative Agreement	0%	Full & Open Competition	0%	Industry	100%
Cost Reimbursable	100%	Sole Source	100%	Government	0%
Fixed Price	0%		100%	NASA Intramural	0%
Grants	0%			University	0%
Other	0%	Sci Peer Review	%	Non Profit	0%
* as of FY03 direct procurement	100%	* as of FY03 direct procurement		* as of FY03 direct procurement	100%

Theme: Space Shuttle

Development: Advanced Health Management System (AHMS)

Future Acquisition - Major	Selection	Goals
None		

AGREEMENTS

Internal: The program is not dependent on other NASA activities outside of the control of the Associate Administrator of Space Flight. External: None Changes since FY 2004 President's Budget: None.

RISK MITIGATION

Risk Date: 12/1/2003

Top Risks	G Overall	G Cost	Y Schedule	G Technical	Probability	Impact	Mitigation Plan
Y	Flight issue may divert contractor resources from AHMS tasks				Low	Moderately High	In Place
R	Initial digital computer unit & signal processor software delivery may not be suitable for hot-fire test				Moderately High	Moderately High	In Place
Y	Software requirements volatility				Medium	Medium	In Place

INDEPENDENT REVIEWS

Review Types	Performer	Last Review Date	Next Review Date	Purpose
Independent Assessment	IPAO	1/01	1/01	Assess probability of meeting schedule and cost. Assess risks and mitigation.

BUDGET/LIFE CYCLE COST

Budget Authority (\$ millions)	Prior	FY03	FY04	FY05	FY06	FY07	FY08	FY09	BTC	Total	Comments
FY2005 PRESBUD	33.6	4.9	6.3	3.3	2.2	1.2				51.5	
Development	33.6	4.9	6.3	3.3	2.2	1.2				51.5	
Changes since 2004 PRESBUD	-3.0	-3.1		+0.3	+0.2	-0.1				-5.7	
Development	-3.0	-3.1		+0.3	+0.2	-0.1				-5.7	
FY2004 PRESBUD	36.6	8.0	6.3	3.0	2.0	1.3				57.2	
Development	36.6	8.0	6.3	3.0	2.0	1.3				57.2	
Initial Baseline	37.5	8.0	3.0	3.0	2.0	1.0				54.5	
AHMS	37.5	8.0	3.0	3.0	2.0	1.0				54.5	Baseline established 7/00 at ATP

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

Theme: Space Shuttle

Development: Cockpit Avionics Upgrade (CAU)

PURPOSE

Objectives	Performance Measures
8.3	5SSP1,4

The CAU will increase crew situational awareness and decrease crew workload in the cockpit to enable more timely and accurate crew decisions. Excessive crew workload adversely affects the crew's situational awareness and impairs crew ability to diagnose and isolate system failures. Improving the crew's ability to manage information during critical flight operations will significantly benefit the safety and reliability of the SSP. The CAU minimum success criteria for safety improvement is a 100 percent increase in trajectory monitoring, a 50 percent increase in critical system monitoring, and 20 percent increase in overall system monitoring.

OVERVIEW

CAU will implement new orbiter cockpit avionics hardware and software to meet the man-machine interface requirements identified by the Space Shuttle Cockpit Council to enhance overall crew safety. Orbiter cockpit displays and crew interface capabilities will be significantly improved by replacing the existing Integrated Display Processors with higher performance Command and Display Processors. These units will provide expanded processing performance to enable dramatic improvements in information access and display capability as well as the implementation of the new Abort Flight Management software function.

PROGRAM MANAGEMENT

CAU is a project with program level responsibility delegated to the Johnson Space Center. The Prime contractor is United Space Alliance. The Space Flight Enterprise Program Management Council has SSP governing responsibility. The Enterprise official is William F. Readdy, Associate Administrator for Space Flight at NASA Headquarters. The Point of Contact is General Michael C. Kostelnik, Deputy Associate Administrator for ISS and SSP at NASA Headquarters. The Project Manager is Daryl Peltier at JSC. Full compliance with NPG 7120.5B will be achieved in FY 2004.

TECHNICAL COMMITMENT

The baseline for this technical commitment was made in September 2000.

Technical Specifications	FY 2005 President's Budget	Change from Baseline
On-board trajectory monitoring	100% increase	--
On board critical systems monitoring	*50% increase	--
On-board overall systems monitoring	*20% increase	--

Increase is relative to current on-board Shuttle cockpit avionics capability as measured using industry standard Situation Awareness Global Assessment Technique (SAGAT).

Schedule	FY 2005 President's Budget	Baseline	Change from Baseline
Preliminary Design Review	Apr-02	Apr-02	complete
Critical Design Review	Sep-03	Jul-03	complete
Ready for First Flight	CY 2006	CY 2006	

ACQUISITION STRATEGY AND PERFORMING ORGANIZATIONS

United Space Alliance has a cost plus award fee/incentive fee contract to develop this project. Changes since FY 2004 President's Budget: None.

Current Acquisition	Actual*	Selection Method	Actual*	Performer	Actual*
Cooperative Agreement	0%	Full & Open Competition	0%	Industry	100%
Cost Reimbursable	100%	Sole Source	100%	Government	0%
Fixed Price	0%		100%	NASA Intramural	0%
Grants	0%			University	0%
Other	0%	Sci Peer Review	%	Non Profit	0%
* as of FY03 direct procurement	100%	* as of FY03 direct procurement		* as of FY03 direct procurement	100%

Theme: Space Shuttle

Development: Cockpit Avionics Upgrade (CAU)

Future Acquisition - Major	Selection	Goals
None		

AGREEMENTS

Internal: Memorandum of Understanding between JSC and NASA Ames Research Center (ARC) regarding common interests in Shuttle improvements and new aerospace technologies (human factors and information technology expertise).
 External: None Changes since FY 2004 President's Budget: None.

RISK MITIGATION

Risk Date: 11/30/2003

Top Risks	Y	Overall	G	Cost	Y	Schedule	G	Technical	Probability	Impact	Mitigation Plan
R									High	Medium	In Place
R									High	Medium	In Place
Y									Medium	Moderately High	In Place

INDEPENDENT REVIEWS

Review Types	Performer	Last Review Date	Next Review Date	Purpose
NAR	IPAO	10/02	N/A	Assess probability of meeting schedule, cost and risks, and measures to mitigate.

BUDGET/LIFE CYCLE COST

Budget Authority (\$ millions)	Prior	FY03	FY04	FY05	FY06	FY07	FY08	FY09	BTC	Total	Comments
FY2005 PRESBUD	181.2	78.8	90.0	83.9	16.5					450.4	
Development	181.2	78.8	90.0	83.9	16.5					450.4	
<u>Changes since 2004 PRESBUD</u>	<u>+9.3</u>	<u>-9.7</u>	<u>-4.3</u>	<u>+4.7</u>	<u>+2.3</u>					<u>+2.3</u>	
Development	+9.3	-9.7	-4.3	+4.7	+2.3					+2.3	
FY2004 PRESBUD	171.9	88.5	94.3	79.2	14.2					448.1	
Development	171.9	88.5	94.3	79.2	14.2					448.1	
Initial Baseline	171.9	88.5	90.5	76.9	14.2					442.0	
CAU	171.9	88.5	90.5	76.9	14.2					442.0	

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

Theme: Space Shuttle
Operations: Program Integration

PURPOSE

Objectives	Performance Measures
8.3	5SSP3,5

SSP Program Integration assures the successful technical integration of all Shuttle elements and payloads into each mission to efficiently and effectively meet the customer requirements in exploring the fundamental principles of physics, chemistry, and biology through research in the unique environment of space. Program Integration performs the analyses necessary to demonstrate the ability to safely and reliably conduct each Shuttle mission.

OVERVIEW

The Program Integration budget includes funds for the analysis, management, and the Safety, Reliability, Maintainability, and Quality Assurance function that is performed for the entire Space Shuttle Program. Program integration includes those elements managed by the Space Shuttle Program Office at the Johnson Space Center and conducted primarily by United Space Alliance, including payload integration into the Space Shuttle and systems integration of the flight hardware elements through all phases of flight. Shuttle integration provides for the engineering analysis needed to ensure that payloads that are integrated to form a viable and safe cargo and meet Space Shuttle interface requirements. Shuttle integration includes the necessary mechanical, aerodynamic, and avionics engineering tasks to ensure that the launch vehicle can be safely launched, fly a safe ascent trajectory, achieve planned performance, and descend to a safe landing. High-priority mission assurance projects for safety, supportability, and infrastructure to combat obsolescence of vehicle, ground systems, and facilities that were formerly part of the Space Shuttle Service Life Extension Program are included in this budget.

PROGRAM MANAGEMENT

The Shuttle Program Integration responsibility is delegated to Johnson Space Center. The Space Flight Enterprise Program Management Council has SSP governing responsibility. The Enterprise official is William F. Readdy, Associate Administrator for Space Flight at NASA Headquarters. The Point of Contact is General Michael C. Kostelnik, Deputy Associate Administrator for ISS and SSP at NASA Headquarters. The Program Manager is William Parsons at JSC. Full compliance with NPG 7120.5B will be achieved in FY 2004.

TECHNICAL COMMITMENT

Flights are baselined approximately 12 to 13 months prior to targeted launch date. As of December 22, 2003, mission content and dates are still under review.

Technical Specifications	FY 2005 President's Budget	Change from Baseline
STS-114	LF1 - Integrate, Deliver, and Return Multi-Purpose Logistics Module	--
STS-121	ULF1.1 - Integrate, Deliver, and Return MPLM, Rotate Crew	--
STS-115	Integrate and Deliver P3/P4 Truss	--
STS-116	Integrate and Deliver P5 Truss, Rotate Crew	--
STS-117	Integrate and Deliver S3/S4 Truss	--
STS-118	Integrate and Deliver S5 Truss	--

Schedule	FY 2005 President's Budget	Change from Baseline
STS-114/Atlantis	TBD Space Shuttle RTF	--
STS-121/Discovery	TBD Space Shuttle RTF	--
STS-115/Atlantis	TBD Space Shuttle RTF	--
STS-116/Discovery	TBD Space Shuttle RTF	--
STS-117/Atlantis	TBD Space Shuttle RTF	--
STS-118/Discovery	TBD Space Shuttle RTF	--

ACQUISITION STRATEGY AND PERFORMING ORGANIZATIONS

The prime contractor for program integration is United Space Alliance under the Space Flight Operations Contract (SFOC). This contract covers operations through September 30, 2004. The SFOC contract was awarded in 1996 as a sole source contract. Changes since FY 2004 President's Budget: None.

Theme: Space Shuttle
Operations: Program Integration

Current Acquisition	Actual*	Selection Method	Actual*	Performer	Actual*
Cooperative Agreement	0%	Full & Open Competition	12%	Industry	99%
Cost Reimbursable	96%	Sole Source	88%	Government	1%
Fixed Price	3%			NASA Intramural	0%
Grants	0%		100%	University	0%
Other	1%	Sci Peer Review	%	Non Profit	0%
* as of FY03 direct procurement	100%	* as of FY03 direct procurement		* as of FY03 direct procurement	100%

Future Acquisition	Selection	Goals
SFOC	Full & Open	President's Management Agenda on Competitive Sourcing

AGREEMENTS

Internal: Not dependent on other NASA activities outside of the control of the Associate Administrator of Space Flight.
 External: None

RISK MITIGATION

Risk Date: 11/30/2003

Top Risks	Y	Overall	G	Cost	Y	Schedule	R	Technical	Probability	Impact	Mitigation Plan
R		Significant Return to Flight milestones left to accomplish							Medium	High	In Place
Y		Manifest risk due to RTF date uncertainty							Moderately High	Medium	In Place

INDEPENDENT REVIEWS

Review Types	Performer	Last Review Date	Next Review Date	Purpose
Mishap Investigation	CAIB	8/03		Determine cause of Columbia accident and provide recommendations.

BUDGET

Budget Authority (\$ millions)	FY 2003	FY 2004	FY 2005	Comments
<u>FY2005 PRESBUD</u>	503.4	609.8	793.0	
Program Integration	503.4	609.8	793.0	
<u>Changes since 2004 PRESBUD</u>	+100.7	+277.7		
Program Integration	+100.7	+277.7		
<u>FY2004 PRESBUD</u>	402.7	332.1		
Program Integration	402.7	332.1		

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

Theme: Space Shuttle
Operations: Ground Operations

PURPOSE

Objectives	Performance Measures
8.3	5SSP1,5

Ground Operations provides final integration and checkout of all hardware elements for launch. It also includes coordination with other government agencies and foreign entities for Shuttle landing capabilities. The major launch site operational facilities at KSC include three Orbiter Processing Facilities, two launch pads, the Vehicle Assembly Building, the Launch Control Center and three Mobile Launcher Platforms.

OVERVIEW

Ground operations support capability includes launch countdown and landing for five Shuttle missions in FY 2005. Ground support for Shuttle landing includes both the Kennedy and Edwards Air Force Base runways and multiple contingency landing sites in the United States and other countries. Ground Operations also includes the maintenance and operations of ground infrastructure to support launch and landing. The orbiters are normally in the hardware processing flow along with External Tanks, Space Shuttle Main Engines, and Solid Rocket Booster components to support several missions.

PROGRAM MANAGEMENT

The Shuttle ground operations responsibility is delegated to Kennedy Space Center. The Space Flight Enterprise Program Management Council has SSP governing responsibility. The Enterprise official is William F. Readdy, Associate Administrator for Space Flight at NASA Headquarters. The Point of Contact is General Michael C. Kostelnik, Deputy Associate Administrator for ISS and SSP at NASA Headquarters. The Program Manager is William Parsons at JSC. Full compliance with NPG 7120.5B will be achieved in FY 2004.

TECHNICAL COMMITMENT

Flights are baselined approximately 12 to 13 months prior to targeted launch date. As of December 22, 2003, mission content and dates are still under review.

Technical Specifications	FY 2005 President's Budget	Change from Baseline
STS-114	LF1 - Integrate, Deliver, and Return Multi-Purpose Logistics Module (MPLM)	New
STS-121	ULF1.1 - Integrate, Deliver, and Return MPLM, Rotate Crew	New
STS-115	Integrate and Deliver P3/P4 Truss	--
STS-116	Integrate and Deliver P5 Truss, Rotate Crew	--
STS-117	Integrate and Deliver S3/S4 Truss	--
STS-118	Integrate and Deliver S5 Truss	--

Schedule	FY 2005 President's Budget	Change from Baseline
STS-114/Atlantis	TBD Space Shuttle RTF	--
STS-121/Discovery	TBD Space Shuttle RTF	--
STS-115/Atlantis	TBD Space Shuttle RTF	--
STS-116/Discovery	TBD Space Shuttle RTF	--
STS-117/Atlantis	TBD Space Shuttle RTF	--
STS-118/Discovery	TBD Space Shuttle RTF	--

ACQUISITION STRATEGY AND PERFORMING ORGANIZATIONS

The prime contractor for ground operations is United Space Alliance under the Space Flight Operations Contract (SFOC). This contract covers operations through September 30, 2004. The SFOC contract was awarded in 1996 as a sole source contract. Changes since FY 2004 President's Budget: None.

Theme: Space Shuttle
Operations: Ground Operations

Current Acquisition	Actual*	Selection Method	Actual*	Performer	Actual*
Cooperative Agreement	0%	Full & Open Competition	12%	Industry	99%
Cost Reimbursable	96%	Sole Source	88%	Government	1%
Fixed Price	3%			NASA Intramural	0%
Grants	0%		100%	University	0%
Other	1%	Sci Peer Review	%	Non Profit	0%
* as of FY03 direct procurement	100%	* as of FY03 direct procurement		* as of FY03 direct procurement	100%

Future Acquisition	Selection	Goals
SFOC	Full & Open	President's Mgt. Agenda on Competitive Sourcing

AGREEMENTS

Internal: The program is not dependent on other NASA activities outside of the control of the Associate Administrator of Space Flight. External: Department of Defense and foreign countries in support of all Emergency Landing Sites. Changes since FY 2004 President's Budget: None.

RISK MITIGATION

Risk Date: 11/30/2003

Top Risks	Y	Overall	G	Cost	Y	Schedule	R	Technical	Probability	Impact	Mitigation Plan
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INDEPENDENT REVIEWS

Review Types	Performer	Last Review Date	Next Review Date	Purpose
Mishap Investigation	CAIB	8/03		Determine cause of Columbia accident and provide recommendations.

BUDGET

Budget Authority (\$ millions)	FY 2003	FY 2004	FY 2005 Comments
<u>FY2005 PRESBUD</u>	568.9	894.2	1,055.5
Ground Operations	568.9	894.2	1,055.5
<u>Changes since 2004 PRESBUD</u>	+41.0	-5.3	
Ground Operations	+41.0	-5.3	
<u>FY2004 PRESBUD</u>	527.9	899.5	
Ground Operations	527.9	899.5	

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

Theme: Space Shuttle
Operations: Flight Operations

PURPOSE

Objectives	Performance Measures
8.3	5SSP1-3,5

SSP Flight Operations assures the successful accomplishment of pre-flight planning, crew training, operations control activities, flight crew operations support, aircraft maintenance and operations, and life sciences operations support for each mission to efficiently and effectively meet customer requirements in exploring the fundamental principles of physics, chemistry, and biology through research in the unique environment of space.

OVERVIEW

The planning activities range from the development of operational concepts and techniques to the creation of detailed systems operational procedures and checklists. Flight operations funding also provides for the maintenance and operation of critical mission support facilities including the Mission Control Center, Integrated Training Facility, Integrated Planning System and the Software Production Facility. The major operations facilities at Johnson Space Center include flight design systems and the fleet of training aircraft.

For more status information go to <http://spaceflight.nasa.gov/>.

PROGRAM MANAGEMENT

The Shuttle Flight Operations responsibility is delegated to Johnson Space Center. The Space Flight Enterprise Program Management Council has SSP governing responsibility. The Enterprise official is William F. Readdy, Associate Administrator for Space Flight at NASA Headquarters. The Point of Contact is General Michael C. Kostelnik, Deputy Associate Administrator for ISS and SSP at NASA Headquarters. The Program Manager is William Parsons at JSC. Full compliance with NPG 7120.5B will be achieved in FY 2004.

TECHNICAL COMMITMENT

Flights are baselined approximately 12 to 13 months prior to targeted launch date. As of December 22, 2003, mission content and dates are still under review.

Technical Specifications	FY 2005 President's Budget	Change from Baseline
STS-114	LF1 - Integrate, Deliver, and Return Multi-Purpose Logistics Module (MPLM)	--
STS-121	ULF1.1 - Integrate, Deliver, and Return MPLM, Rotate Crew	--
STS-115	Integrate and Deliver P3/P4 Truss	--
STS-116	Integrate and Deliver P5 Truss, Rotate Crew	--
STS-117	Integrate and Deliver S3/S4 Truss	--
STS-118	Integrate and Deliver S5 Truss	--

Schedule	FY 2005 President's Budget	Change from Baseline
STS-114/Atlantis	TBD Space Shuttle RTF	--
STS-121/Discovery	TBD Space Shuttle RTF	--
STS-115/Atlantis	TBD Space Shuttle RTF	--
STS-116/Discovery	TBD Space Shuttle RTF	--
STS-117/Atlantis	TBD Space Shuttle RTF	--
STS-118/Discovery	TBD Space Shuttle RTF	--

ACQUISITION STRATEGY AND PERFORMING ORGANIZATIONS

The prime contractor for flight operations is United Space Alliance under the Space Flight Operations Contract (SFOC). This contract covers two years of operations through September 30, 2004. The SFOC contract was awarded in 1996 as a sole source contract. Changes since FY 2004 President's Budget: None.

Theme: Space Shuttle
Operations: Flight Operations

Current Acquisition	Actual*	Selection Method	Actual*	Performer	Actual*
Cooperative Agreement	0%	Full & Open Competition	12%	Industry	99%
Cost Reimbursable	96%	Sole Source	88%	Government	1%
Fixed Price	3%			NASA Intramural	0%
Grants	0%		100%	University	0%
Other	1%	Sci Peer Review	0%	Non Profit	0%
* as of FY03 direct procurement	100%	* as of FY03 direct procurement		* as of FY03 direct procurement	100%

Future Acquisition	Selection	Goals
SFOC	Full & Open	President's Management Agenda on Competitive Sourcing.

AGREEMENTS

Internal: The program is not dependent on other NASA activities outside of the control of the Associate Administrator of Space Flight. External: None Changes since FY 2004 President's Budget: None.

RISK MITIGATION

Risk Date: 11/30/2003

Top Risks	Y	Overall	G	Cost	Y	Schedule	R	Technical	Probability	Impact	Mitigation Plan
Y		Significant Return to Flight milestones left to accomplish						Moderately High	Medium	In Place	
R		Manifest risk due to RTF date uncertainty						Medium	High	In Place	

INDEPENDENT REVIEWS

Review Types	Performer	Last Review Date	Next Review Date	Purpose
Mishap Investigation	CAIB	8/03		Determine cause of Columbia accident and provide recommendations.

BUDGET

Budget Authority (\$ millions)	FY 2003	FY 2004	FY 2005	Comments
FY2005 PRESBUD	267.9	373.2	405.4	
Flight Operations	267.9	373.2	405.4	
Changes since 2004 PRESBUD	+3.3	-2.2		
Flight Operations	+3.3	-2.2		
FY2004 PRESBUD	264.6	375.4		
Flight Operations	264.6	375.4		

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

Theme: Space Shuttle
Operations: Flight Hardware

PURPOSE

Objectives	Performance Measures
8.3	5SSP1-3,5

SSP Flight Hardware assures the vehicle hardware and software are designed, developed, manufactured, and tested sufficiently to enable the safe and reliable transportation that meets customer requirements for research in the unique environment of space. Shuttle Flight Hardware and software assures the success of each Shuttle mission.

OVERVIEW

The Flight Hardware program produces space components to support Shuttle mission requirements and ensures core skills and capabilities required for maintaining the orbiter as a safe and effective transportation and science platform. Other support requirements are also provided for in this budget, including tasks, which support flight software development and verification. The software activities include development, formulation and verification of the guidance, targeting and navigation systems software in the orbiter.

PROGRAM MANAGEMENT

The Shuttle flight hardware responsibility is delegated to Johnson Space Center for Orbiter and Extra-vehicular Activity (EVA), MSFC for ET, RSRM, SRB, and SSME, and SSC for SSME test support. The Space Flight Enterprise Program Management has SSP governing responsibility. Enterprise official is William F. Readdy, Associate Administrator for Space Flight at Headquarters. Point of Contact is General Michael C. Kostelnik, Deputy Associate Administrator for ISS and SSP at Headquarters. The Program Manager is William Parsons at JSC. Full compliance with NPG 7120.5B will be achieved in FY 2004.

TECHNICAL COMMITMENT

Flights are baselined approximately 12 to 13 months prior to targeted launch date. As of December 22, 2003 mission content and dates are still under review.

Technical Specifications	FY 2005 President's Budget	Change from Baseline
STS-114	LF1 -Integrate, Deliver, and Return MPLM	New
STS-121	ULF1.1 -Integrate, Deliver, and Return MPLM, Rotate Crew	New
STS-115	Integrate and Deliver P3/P4 Truss	--
STS-116	Integrate and Deliver P5 Truss, Rotate Crew	--
STS-117	Integrate and Deliver S3/S4 Truss	--
STS-118	Integrate and Deliver S5 Truss	--

Schedule	FY 2005 President's Budget	Change from Baseline
STS-114/Atlantis	TBD Space Shuttle RTF	--
STS-121/Discovery	TBD Space Shuttle RTF	--
STS-115/Atlantis	TBD Space Shuttle RTF	--
STS-116/Discovery	TBD Space Shuttle RTF	--
STS-117/Atlantis	TBD Space Shuttle RTF	--
STS-118/Discovery	TBD Space Shuttle RTF	--

ACQUISITION STRATEGY AND PERFORMING ORGANIZATIONS

The Prime Contractor for the external tank is Lockheed Martin Corporation. This contract expires December 1, 2008. The Prime Contractor for the Space Shuttle Main Engine is Boeing-Rocketdyne Propulsion and Power Systems. This contract expires December 31, 2006. The Prime Contractor for the Vehicle and Solid Rocket Booster is United Space Alliance (USA). This contract ends September 30, 2004. The Prime Contractor for the Reusable Solid Rocket Motor is ATK Thiokol Propulsion. This contract covers two years of operations, renewable in FY 2004. The prime contractors for the Extravehicular Mobility Unit are United Space Alliance for hardware processing and Hamilton Sundstrand for development and sustaining engineering. This USA contract ends September 30, 2004. Changes since FY 2004 President's Budget: None.

Theme: Space Shuttle
Operations: Flight Hardware

Current Acquisition	Actual*	Selection Method	Actual*	Performer	Actual*
Cooperative Agreement	0%	Full & Open Competition	12%	Industry	99%
Cost Reimbursable	96%	Sole Source	88%	Government	1%
Fixed Price	3%			NASA Intramural	0%
Grants	0%		100%	University	0%
Other	1%	Sci Peer Review	%	Non Profit	0%
* as of FY03 direct procurement	100%	* as of FY03 direct procurement		* as of FY03 direct procurement	100%

Future Acquisition	Selection	Goals
SFOC	Full & Open	President's Management Agenda on Competitive Sourcing

AGREEMENTS

Internal: The program is not dependent on other NASA activities outside of the control of the Associate Administrator of Space Flight. External: None Changes since FY 2004 President's Budget: None.

RISK MITIGATION

Risk Date: 11/30/2003

Top Risks	Y	Overall	G	Cost	Y	Schedule	R	Technical	Probability	Impact	Mitigation Plan
G									Low	Medium	In Place
OV-103 OMM Rudder Speed Brake Actuators									Medium	Moderately High	In Place
Y									Low	Medium	In Place
External Tank Attachment Ring safety requirements									Medium	Medium	In Place
Y									Medium	Medium	In Place
Orbiter Boom Sensor System capability											

INDEPENDENT REVIEWS

Review Types	Performer	Last Review Date	Next Review Date	Purpose
Mishap Investigation	CAIB	8/03	N/A	Determine cause of Columbia accident and provide recommendations.

BUDGET

Budget Authority (\$ millions)	FY 2003	FY 2004	FY 2005	Comments
<u>FY2005 PRESBUD</u>	<u>1,705.2</u>	<u>1,971.5</u>	<u>1,978.1</u>	
Flight Hardware	1,705.2	1,971.5	1,978.1	
<u>Changes since 2004 PRESBUD</u>	<u>+23.5</u>	<u>-11.6</u>		
Flight Hardware	+23.5	-11.6		
<u>FY2004 PRESBUD</u>	<u>1,681.7</u>	<u>1,983.1</u>		
Flight Hardware	1,681.7	1,983.1		

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