Strategic Goal 1: Extend and sustain human activities across the solar system.

OUTCOME 1.1: SUSTAIN THE OPERATION AND FULL USE OF THE INTERNATIONAL SPACE STATION (ISS) AND EXPAND EFFORTS TO UTILIZE THE ISS AS A NATIONAL LABORATORY FOR SCIENTIFIC, TECHNOLOGICAL, DIPLOMATIC, AND EDUCATIONAL PURPOSES AND FOR SUPPORTING FUTURE OBJECTIVES IN HUMAN SPACE EXPLORATION.

The International Space Station is a major steppingstone in achieving NASA's exploration goals across the solar system. It is a space-based research and development laboratory to perform multidisciplinary, cutting-edge research. With assembly of ISS complete, the full-time crew of six can enable the on-going evolution of research and technology objectives and ensure that the benefits of this multinational investment can be realized.

This orbiting research laboratory allows NASA to develop, test, and validate the next generation of space technologies and operational processes needed to explore beyond low Earth orbit. It provides opportunities to address practical medical questions about astronaut health like mitigating the effects of long-term stays in space. The International Space Station supports an array of research in the biological and physical sciences necessary to advance knowledge and spaceflight capabilities. It also supports advanced engineering research and technology development for space exploration.

Under the auspices of a non-profit management organization, the Center for Advanced Science in Space (CASIS), NASA is making ISS available to other U.S. government agencies, university-based scientists and engineers, and private firms as a national resource for advancing basic and applied research in science and technology. CASIS is responsible for stimulating, developing, and managing a diversified research and development portfolio that will use the research facilities and environment aboard ISS to address U.S. needs.

Reported Multi-Year Performance

Multi-Year Performance Goal 1.1.1.1: Maintain capability for six on-orbit crew members.

FY11	NASA and its International Partners maintained the full six-person crew throughout FY 2012, except for the brief periods when ISS was staffed with the planned three crew during each scheduled Soyuz rotation, when the Russian spacecraft is taking crew to and from ISS. The ISS crewmembers were able to maintain the planned 35 crew hours per week throughout the year scheduled for utilization and were successful in supporting 100 percent of the planned research. Part of maintaining the six-person crew is managing resources on board ISS. The crew reports the status of the resources, consumables, logistics, systems, and operational
Green	
FY12	
Green	

	procedures to the ISS Program Director and International Partners quarterly via the Space Station Control Board.

Update to Multi-Year Performance Goal	
FY13 Update	This performance goal remains the same in FY13.
FY14	This performance goal remains the same in FY14.

Reported Annual Performance					
ISS-12-1: In concert with the International Partners, maintain a continuous six crew capability on the ISS by coordinating and managing resources, logistics, systems, and operational procedures.					
Contributing Theme:		International Space Station			
Contributing Program(s):		International Space Station			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
7ISS5 Green	**8ISS06 Green**	**9ISS6 Green**	**10ISS07 Green**	**ISS-11-1 Green**	**ISS-12-1 Green**
Planned Annual Performance					
FY13 Update	ISS-13-1: In concert with International Partners, maintain a continuous six-crew capability on ISS by coordinating and managing resources, logistics, systems, and operational procedures.				
FY14	ISS-14-1: In concert with International Partners, maintain a continuous six-crew capability on ISS by coordinating and managing resources, logistics, systems, and operational procedures.				

Reported Multi-Year Performance

Multi-Year Performance Goal 1.1.1.2: HPPG: Safely fly out the Space Shuttle manifest and retire the fleet.

FY11
Green
FY12
Green

This performance goal, created in FY 2010, had several important steps: complete the final flights of the Space Shuttle fleet; award the Orbiters and other artifacts to museums and educational and outreach institutions for public display; retire the Orbiters and prepare them for transport; and deliver the assets to their display locations. Using institutional funds, NASA continued to transfer or excess property, IT, systems, and records, with the goal of completing all tasks by the end of FY 2013. Some activities may continue beyond FY 2013.

The Orbiter deliveries were major events that drew large crowds:

• On April 18, 2012, NASA ferried Space Shuttle Discovery by a modified Boeing 747 aircraft from the Kennedy Space Center in Florida, over the National Mall in downtown Washington, DC, and to the National Air and Space Museum's Udvar-Hazy Center in Chantilly, Virginia.
• After delivering Discovery to its new home, the Boeing 747 ferried Space Shuttle Enterprise, which had been on display at the Udvar-Hazy Center, to the John F. Kennedy International Airport on April 27. NASA placed the Orbiter on a barge and sailed it to a temporary display location on the deck of the Intrepid at Pier 87 in New York City on July 19.
• The Space Shuttle Endeavour's final ferry started September 19 at Kennedy Space Center and included a public display across the lower eastern United States. After NASA transported the Orbiter up to the Ames Research Center in the San Francisco Bay area for a

	last flyover, NASA delivered Endeavour to Los Angeles International Airport on September 21. A 13.5-mile long parade took place in October as Endeavour traveled through the city streets from the airport to the California Science Center, where the Orbiter went on display. • The Space Shuttle Atlantis moved to its final display location at the Kennedy Space Center Visitor Center in November 2012.

Update to Multi-Year Performance Goal	
FY13 Update	No performance goal in FY13.
FY14	No performance goal in FY14.
Comments	After 30 years of Space Shuttle flights, NASA flew the last missions in FY 2011. The Space Shuttle Program completed the last major milestones in FY 2012 as part of program close out. Therefore, NASA is discontinuing performance measures for this program as of FY 2013.

Reported Annual Performance					
SSP-12-1: Ensure the Space Shuttle Discovery is ready for transport to its final display location.					
Contributing Theme:		Space Shuttle			
Contributing Program(s):		Space Shuttle			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**10SSP04 Green**	**SSP-11-1 Green**	**SSP-12-1 Green**
Planned Annual Performance					
FY13 Update	No annual performance goal in FY13.				
FY14	No annual performance goal in FY14.				

Reported Multi-Year Performance

Multi-Year Performance Goal 1.1.1.3: Provide cargo and crew transportation to support on-orbit crew members and utilization.

FY11
Green
FY12
Green

NASA completed all planned resupply flights during FY 2012. Furthermore, one of NASA's Commercial Space Transportation partners completed a major milestone. The final Space Exploration Technologies (SpaceX) demonstration flight launched on May 19, 2012, berthed to ISS and returned successfully on May 31. This flight represented the first commercial cargo launch to ISS, as well as the first autonomous ISS rendezvous by a U.S. spacecraft.

The SpaceX demonstration flight was originally planned as two flights during FY 2012; however, SpaceX requested, and NASA approved, combining the two flights into one flight in December 2011. While SpaceX-1 could have been launched in September 2012, NASA delayed the mission until October due to previously scheduled activities aboard ISS during the fourth quarter of FY 2012. The ISS crew had to launch, dock, and undock the HTV3; undock the ATV3; undock the Soyuz 31 crew; launch and dock Progress 48; and conduct two spacewalks. After the ISS crew successfully executed all previously scheduled activities, SpaceX-1 launched on October 7.

Orbital Science Corporation has a demonstration flight scheduled for 2013.

PERFORMANCE REPORTING AND PLANNING

Update to Multi-Year Performance Goal	
FY13 Update	This performance goal remains the same in FY13.
FY14	This performance goal remains the same in FY14.

Reported Annual Performance					
ISS-12-2: Fly the ISS spares, logistics, and utilization hardware as agreed to by the International Partners in the ISS transportation plan.					
Contributing Theme:		International Space Station			
Contributing Program(s):		International Space Station			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
7ISS3 Green	**8ISS03 Green**	**9ISS3 Green**	**10ISS03 Yellow**	**ISS-11-2 Green**	**ISS-12-2 Green**

Planned Annual Performance	
FY13 Update	No annual performance goal in FY13.
FY14	No annual performance goal in FY14.
Comments	NASA has continually met its targets for flying spares, logistics, and utilization hardware with the exception of one Yellow-rated measure in FY 2010. In FY 2010, the performance measure also included flying ISS elements; technical issues delayed Shuttle missions and the delivery of some ISS elements, resulting in a Yellow rating. Due to the ISS Program's consistently good performance in this area, NASA is retiring this annual measure.

Reported Annual Performance					
ISS-12-3: Complete at least two flights to the ISS by U.S.-developed cargo delivery systems.					
Contributing Theme:		International Space Station			
Contributing Program(s):		International Space Station			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**None**	**None**	**ISS-12-3 Green**

Planned Annual Performance	
FY13 Update	ISS-13-2: Complete at least three flights, delivering research and logistics hardware to ISS, by U.S.-developed cargo delivery systems.
FY14	ISS-14-2: Complete at least three flights, delivering research and logistics hardware to ISS, by U.S.-developed cargo delivery systems.

Reported Multi-Year Performance

Multi-Year Performance Goal 1.1.1.4: Maintain and operate a safe and functional ISS.

FY11	The International Space Station Program maintained its stellar record of safety and functionality through FY 2012. A fully functional ISS means that ISS systems and elements are working and available to support the research plan. Regularly scheduled repair and maintenance tasks ensure the health and safety of the vehicle. The Space Station Control Board reviews ISS systems, operations, consumables, resources, and transportation status quarterly to ensure that ISS is fully functional.
Green	
FY12	
Green	

PERFORMANCE REPORTING AND PLANNING

Update to Multi-Year Performance Goal	
FY13 Update	No performance goal in FY13.
FY14	No performance goal in FY14.
Comments	NASA maintains the intent of this performance goal, the safety and functionality of ISS, as top priorities for the ISS Program. Now that NASA and international partners have completed construction of ISS, and the program has shifted its focus to full utilization, this performance goal is no longer necessary for NASA management. NASA has realigned its remaining APG to performance goal 1.1.2.1, which NASA has rewritten to focus on the major areas for ISS utilization.

Reported Annual Performance					
ISS-12-5: Achieve zero Type-A (damage to property at least $1 million or death) or Type-B (damage to property at least $250 thousand or permanent disability or hospitalization of three or more persons) mishaps.					
Contributing Theme:	International Space Station				
Contributing Program(s):	International Space Station				
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**10ISS05 Green**	**ISS-11-4 Green**	**ISS-12-5 Green**
Planned Annual Performance					
FY13 Update	No annual performance goal in FY13.				
FY14	No annual performance goal in FY14.				

Reported Multi-Year Performance

Multi-Year Performance Goal 1.1.2.1: Advance knowledge of long-duration human space flight by establishing agreements with organizations to enable full utilization of the ISS.

FY11
Green
FY12
Green

Research on ISS continues to advance science and technology knowledge. The ISS international partner team published the International Space Station Benefits for Humanity document in February 2012, to provide examples of the ISS groundbreaking scientific research in human health, Earth observation and disaster response, and global education. This document summarizes the scientific, technological, and educational accomplishments of the many international and domestic organizations utilizing ISS.

NASA and CASIS fully supported the first annual ISS Research and Development Conference, held from June 26 to 28, 2012, in Denver, Colorado. The conference provided a forum for current ISS researchers to provide results (presentations available from the American Astronautical Society) of their research and for potential researchers to learn about the opportunities available to perform research on ISS. Over 400 participants attended the meeting to learn how to meet NASA's goal of full utilization of ISS to advance scientific knowledge and prepare for long-duration spaceflight.

CASIS continues to make progress in accomplishing the metrics documented in their 2012 Annual Program Plan and meeting the obligations in the Cooperative Agreement. The ISS team is continuing to transfer non-NASA partnership agreements to the CASIS organization

PERFORMANCE REPORTING AND PLANNING

	as planned in the Cooperative Agreement. The CASIS team used the ISS Research and Development Conference to meet with potential researchers and funding sources. All future partnership agreements will be the responsibility of the CASIS management team.

Update to Multi-Year Performance Goal	
FY13 Update	Maintain a safe and functional ISS national laboratory and utilize it to advance engineering, technology, and science research.
FY14	This performance goal remains the same in FY14.
Comments	As of FY 2013, NASA has broadened this performance goal to reflect the scope of work realigned underneath it. NASA moved the APG that was under performance goal 1.1.1.4 to this revised performance goal.

Reported Annual Performance					
ISS-12-4: Provide 100 percent of planned on-orbit resources (including power, data, crew time, logistics, and accommodations) needed to support research.					
Contributing Theme:		International Space Station			
Contributing Program(s):		International Space Station			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**10ISS08 Green**	**ISS-11-3 Green**	**ISS-12-4 Green**
Planned Annual Performance					
FY13 Update	ISS-13-5: Provide 100 percent of planned on-orbit resources (including power, data, crew time, logistics, and accommodations) needed to support research.				
FY14	No annual performance goal in FY14.				

Reported Annual Performance					
ISS-12-6: Accomplish a minimum of 90 percent of the on-orbit research objectives, as baselined by NASA and ISS Non-profit organization (NPO).					
Contributing Theme:		International Space Station			
Contributing Program(s):		International Space Station			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**None**	**ISS-11-5 Green**	**ISS-12-6 Green**
Planned Annual Performance					
FY13 Update	ISS-13-3: Accomplish a minimum of 90 percent of the on-orbit research and technology development objectives. Objectives are baselined by NASA and the ISS Non-profit organization one month prior to each increment, which is the time period between crew rotations.				
FY14	ISS-14-3: Accomplish a minimum of 90 percent of the on-orbit research and technology development objectives. Objectives are baselined by NASA, ISS non-profit organization, and the ISS Technology Demonstration Office one month prior to each increment, which is the time period between crew rotations.				

PERFORMANCE REPORTING AND PLANNING

Reported Annual Performance	
No annual performance goal in FY12 or trended performance.	
Contributing Theme:	International Space Station
Contributing Program(s):	International Space Station
Planned Annual Performance	
FY13 Update	ISS-13-4: Fully utilize ISS by ensuring that at least 75 percent of the research sites available are used.
FY14	ISS-14-4: Ensure that at least 80 percent of the research sites available are used.

Reported Multi-Year Performance

Multi-Year Performance Goal 1.1.2.2: Conduct basic and applied biological and physical research to advance and sustain U.S. scientific expertise.

FY11
Green
FY12
Green

Operations continued for the investigations in the Combustion and Fluids Racks, the Microgravity Science Glovebox (MSG), and the Materials Science Research Rack on ISS. Crewmembers conducted several physical sciences experiments, including the Flame Extinguishment Experiment (FLEX-2), the Structure and Liftoff In Combustion Experiment (SLICE), the Capillary Flow Experiment-2 (CFE-2), the Binary Colloidal Alloy Test-6 (BCAT-6), and the Advanced Colloids Experiment-1 (ACE-1).

During the fourth quarter of the fiscal year, NASA released a solicitation for research in space biology, to design concepts for ISS capabilities now in development.

Update to Multi-Year Performance Goal	
FY13 Update	This performance goal remains the same in FY13.
FY14	This performance goal remains the same in FY14.

Reported Annual Performance					
ISS-12-7: Conduct flight definition review for at least five flight experiments in fundamental space biology.					
Contributing Theme:		International Space Station			
Contributing Program(s):		International Space Station			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**8AC02 Green**	**9AC3 Green**	**10AC03 Green**	**ERD-11-1 Green**	**ISS-12-7 Green**
Planned Annual Performance					
FY13 Update	ISS-13-6: Conduct flight definition reviews for at least five flight experiments in fundamental space biology that were selected through a NASA Research Announcement.				
FY14	ISS-14-5: Complete all pre-flight activities and be ready to support the launch of the first flight with animals.				

PERFORMANCE REPORTING AND PLANNING

Reported Annual Performance					
ISS-12-8: Deliver at least two physical sciences payloads for launch to the ISS.					
Contributing Theme:		International Space Station			
Contributing Program(s):		International Space Station			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**8AC01 Green**	**9AC1 Green**	**10AC01 Green**	**ERD-11-2 Green**	**ISS-12-8 Green**
Planned Annual Performance					
FY13 Update	ISS-13-7: Deliver at least four physical sciences payloads for launch to ISS.				
FY14	No annual performance goal in FY14.				

Reported Annual Performance					
ISS-12-9: Conduct at least five experiments in combustion, fluids, or materials sciences on the ISS.					
Contributing Theme:		International Space Station			
Contributing Program(s):		International Space Station			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**9AC2 Green**	**10AC02 Green**	**ERD-11-3 Green**	**ISS-12-9 Green**
Planned Annual Performance					
FY13 Update	ISS-13-8: Conduct at least six experiments in combustion, fluids, or materials sciences on ISS.				
FY14	No annual performance goal in FY14.				
Comments	NASA is revisiting the performance measurement strategy for this program and will add any new measures for FY 2014 during the development of FY 2015 Performance Plan.				

PERFORMANCE REPORTING AND PLANNING

OUTCOME 1.2: DEVELOP COMPETITIVE OPPORTUNITIES FOR THE COMMERCIAL COMMUNITY TO PROVIDE BEST VALUE PRODUCTS AND SERVICES TO LOW EARTH ORBIT AND BEYOND.

Commercial space transportation is a vital component to the future of human space exploration. As NASA charts a new course to send humans deeper into space than ever before, it also is stimulating efforts with the private sector to develop and operate safe, reliable, and affordable commercial low Earth orbit transportation systems. NASA will purchase commercial services to transport crew and cargo to the International Space Station and low Earth orbit as capabilities mature and become available to the government and other customers. NASA is investing financial and technical resources to stimulate efforts within the private sector to develop and demonstrate safe, reliable, and cost-effective space transportation capabilities. NASA currently manages one Commercial Orbital Transportation Services (COTS) Space Act Agreement (SAA) with Orbital Sciences Corporation (Orbital) for cargo transportation capabilities development and demonstration. A second SAA between NASA and SpaceX has concluded with the successful demonstration flight of the SpaceX Dragon spacecraft to and from ISS. Through Commercial Crew Development (CCDev), NASA is aiding development and demonstration of crew transportation capabilities.

Reported Multi-Year Performance

Multi-Year Performance Goal 1.2.1.1: Develop competitive opportunities for the commercial community to provide best value products and services to low Earth orbit and beyond.

FY11	NASA is nearing completion of the second round of the Agency's CCDev-2 initiative, a partnership that advanced participants' crew transportation system concepts and matured the design and development of elements of their systems. CCDev-2 partners included:
Green	
FY12	• Blue Origin, maturing the Space Vehicle design, pusher escape system, and accelerating engine development for their Reusable Booster System; • Sierra Nevada Corporation, maturing the Dream Chaser crew spacecraft; • SpaceX, maturing an integrated, side-mounted launch abort system for the crewed Dragon Spacecraft; and • The Boeing Company, maturing the CST-100 crewed spacecraft design and development. In August, the Agency signed Space Act Agreements for the next phase of commercial crew development, the Commercial Crew integrated Capability (CCiCap). Partners for this initiative include Sierra Nevada Corporation, The Boeing Company, and SpaceX. During this effort, industry partners will develop crew transportation capabilities as fully integrated systems. Between now and May 31, 2014, NASA's partners will perform tests and mature integrated designs, setting the stage for a future activity that will launch crewed orbital demonstration missions to low Earth orbit by the middle of the decade. On May 31, 2012, SpaceX successfully completed their final COTS demonstration mission to ISS, completing all test objectives. Orbital is scheduled to complete a COTS demonstration mission to ISS next year, concluding development and demonstration of its cargo transportation system to low Earth orbit.
Green	

PERFORMANCE REPORTING AND PLANNING

Update to Multi-Year Performance Goal	
FY13 Update	Invest financial and technical resources to stimulate efforts within the private sector to develop and demonstrate safe, reliable, and cost-effective space transportation capabilities.
FY14	This performance goal remains the same in FY14.
Comments	NASA has broadened this performance goal to encompass all types of resources that the Agency offers to the commercial space community. In FY 2014, NASA will retire performance goal 1.2.1.2 and realign activities related to certification processes under this performance goal.

Reported Annual Performance					
CS-12-1: Perform Commercial Orbital Transportation Services (COTS) cargo demonstration missions and continue commercial crew transportation systems development.					
Contributing Theme:		Commercial Spaceflight			
Contributing Program(s):		Commercial Cargo			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**None**	**CS-11-4 Green**	**CS-12-1 Green**
Planned Annual Performance					
FY13 Update	CS-13-2: Conduct a minimum of one commercial cargo demonstration flight of new cargo transportation systems, including proximity operations with ISS.				
FY14	No annual performance goal in FY14.				

Reported Annual Performance					
No annual performance goal in FY12.					
Contributing Theme:		Commercial Spaceflight			
Contributing Program(s):		Commercial Crew			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**8CS08 Yellow**	**9CS9 Yellow**	**10CS07 Yellow**	**CS-11-2 Yellow**	**None**
Planned Annual Performance					
FY13 Update	CS-13-1: Execute Space Act Agreements (SAAs) for development of a commercial Crew Transportation System (CTS).				
FY14	CS-14-1: Complete the Commercial Crew Certification Products Contracts that will provide key information on how a commercial crew transportation system can meet NASA certification requirements.				
FY14	CS-14-2: Award the second phase Commercial Crew Transportation System certification contracts.				

PERFORMANCE REPORTING AND PLANNING

Reported Multi-Year Performance

Multi-Year Performance Goal 1.2.1.2: Develop and document evaluation and certification processes for an integrated commercial crew transportation system.

FY11 **Green** **FY12** **Green**	NASA developed and released baseline versions of the CCT-1100 series of documents in December 2011. These documents communicate roles and responsibilities, technical management processes supporting certification, crew transportation system and ISS services requirements, ISS interface requirements, and the application of technical and operations standards for potential commercial providers. NASA's overarching strategy for the development of these documents is to ensure the requirements meet the Agency's safety and performance standards. NASA also wants to avoid being overly prescriptive, allowing commercial industry maximum flexibility to develop safe, reliable, and cost-effective human space transportation systems. NASA has defined its certification plan and updated its strategy for award of Federal Acquisition Regulations (FAR)-based contracts for the certification phase for commercial crew transportation. In parallel with the announcement of the CCiCAP awards, NASA announced that it would undertake a competitive two-phased acquisition for NASA crew transportation system certification. Under the certification contracts, NASA will manage the certification process to ensure that commercial partners have met NASA requirements in their certification plans. Crew transportation system certification Phase 1, referred to as Certification Products Contract(s), will begin in January 2013 and will be limited to submittal and technical disposition of the following specific, early lifecycle certification products: Alternate Standards, Hazard Analyses, a Certification Plan, and a Verification and Validation Plan. At the conclusion of the phase, NASA anticipates that more than one commercial provider will have achieved the technical maturity of an integrated design state to enable a Phase 2 competition for the crew transportation system certification contract. Under NASA's planned strategy, the scope of the certification contract will include development, test, evaluation, and certification activities enabling NASA to assess the crew transportation system capability for performing ISS missions in compliance with NASA requirements. This will ensure NASA mission and safety objectives are achieved.

Update to Multi-Year Performance Goal	
FY13 Update	No performance goal in FY13.
FY14	No performance goal in FY14.
Comments	NASA is eliminating this performance goal and moving certification activities to performance goal 1.2.1.1. Evaluation and certification are key processes in the development of commercial crew transportation systems. By providing evaluation and certification processes, NASA helps the commercial community develop and demonstrate space transportation technologies.

PERFORMANCE REPORTING AND PLANNING

Reported Annual Performance					
CS-12-2: Baseline ISS Crew Transportation and Service Requirements document, CTS-REQ-1130, and Crew Transportation Technical Standards and Design Evaluation Criteria document, CCT-STD-1140.					
Contributing Theme:		Commercial Spaceflight			
Contributing Program(s):		Commercial Crew			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**None**	**CS-11-5 Green**	**CS-12-2 Green**
Planned Annual Performance					
FY13 Update	No annual performance goal in FY13.				
FY14	No annual performance goal in FY14.				

PERFORMANCE REPORTING AND PLANNING

OUTCOME 1.3: DEVELOP AN INTEGRATED ARCHITECTURE AND CAPABILITIES FOR SAFE CREWED AND CARGO MISSIONS BEYOND LOW EARTH ORBIT.

Exploration beyond low Earth orbit will span decades, with the first steps being the development of solid groundwork to ensure a successful endeavor. Experienced personnel from across the Agency are building a set of architectures, or mission frameworks, for multiple destinations in the solar system. These architectures include all aspects of mission performance that define the knowledge, capabilities, and infrastructure necessary to support human space exploration. Those aspects include technologies, partnerships, safety, risk assessment and reduction, schedule management, operations, and stakeholder priorities.

Reported Multi-Year Performance

Multi-Year Performance Goal 1.3.1.1: Complete design reviews for Space Launch System (SLS).

FY11
Green
FY12
Green

The SLS Program, NASA's program to develop an advanced, heavy-lift launch vehicle for exploration beyond Earth's orbit, is on target to complete design reviews for the uncrewed test flight, Exploration Mission (EM)-1. Information provided at monthly Program Management Reviews supports the existing launch date, as well as scheduled design reviews. Management combined the SLS system requirements review (SRR) with its system definition review (SDR), and conducted the combined review into two steps. Step 1 was an extensive technical review that was successfully completed on March 29, 2012. Step 2 was an internal in-depth business review that occurred May 17, 2012. Step 2 led to formal input from the standing review board. The standing review board's results, along with SLS responses, of the cost, technical, schedule, and risk status were presented to the Agency on June 29, 2012. Space Launch System completed its internal SRR and SDR program review, and on July 25, 2012, the program progressed to Phase B, which is the preliminary design and formulation phase.

The SLS Program also completed the Core Stage SRR and SDR board on June 15, 2012, allowing Core Stage work to progress from Phase A (concept development) into Phase B (preliminary design and formulation).

Update to Multi-Year Performance Goal	
FY13 Update	Complete design reviews for the Space Launch System (SLS) and make progress on system development toward a first uncrewed test flight in 2017 and first crewed flight in 2021.
FY14	This performance goal remains the same in FY14.
Comments	NASA broadened the language of this performance goal to reflect the greater scope of work for this program and to clarify what the annual measures are targeting.

Reported Annual Performance					
ESD-12-1: Successfully complete the Space Launch System (SLS) Systems Requirements Review (SRR).					
Contributing Theme:		Exploration Systems and Development			
Contributing Program(s):		Space Launch System			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**None**	**HEC-11-1 Green**	**ESD-12-1 Green**

PERFORMANCE REPORTING AND PLANNING

Planned Annual Performance	
FY13 Update	ESD-13-1: Complete the SLS Preliminary Design Review (PDR) and establish the technical design, cost, and schedule baseline for the SLS first flight.
FY14	ESD-14-1: Complete the Qualification Motor (QM-2) Test, and use the data from the test to support the SLS Program Critical Design Review.

Reported Multi-Year Performance

Multi-Year Performance Goal 1.3.1.2: Complete design reviews for Orion Multi-Purpose Crew Vehicle (MPCV).

FY11 **Green** **FY12** **Green**	The Orion MPCV Program is on target to complete design reviews for Exploration Flight Test (EFT)-1, the first planned uncrewed test flight of the Orion MPCV, and Exploration Mission (EM)-1. Information provided at monthly Program Management Reviews supports the existing launch dates, as well as scheduled design reviews. MPCV is on track to conduct a Key Decision Point (KDP)-B review in late July 2012, with final KDP-B approval in fall 2012. In January 2012, Orion-MPCV successfully completed testing of the Ground Test Article. NASA used the Ground Test Article, which is representative of the Orion MPCV, to test if the capsule would turn right side up after a water landing and whether the structure would withstand the impact. NASA also completed the welding of the EFT-1 primary structure, the crew module that will be used as the test article for EFT-1.

Update to Multi-Year Performance Goal	
FY13 Update	Complete design reviews for Orion Multi-Purpose Crew Vehicle (MPCV) and make progress on system development toward a first uncrewed test flight in 2017 and first crewed flight in 2021.
FY14	This performance goal remains the same in FY14.
Comments	NASA broadened the language of this performance goal to reflect the greater scope of work for this program and to clarify what the annual measures are targeting.

Reported Annual Performance					
ESD-12-2: Complete testing of Orion Multi-Purpose Crew Vehicle (MPCV) Ground Test Article (GTA).					
Contributing Theme:		Exploration Systems and Development			
Contributing Program(s):		Orion Multi-Purpose Crew Vehicle			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**None**	**HEC-11-2 Green**	**ESD-12-2 Green**

Planned Annual Performance	
FY13 Update	ESD-13-2: Manufacture Orion Multi-Purpose Crew Vehicle (MPCV) flight test hardware required for initial integration testing for the Exploration Flight Test 1 (EFT-1).
FY14	ESD-14-2: Complete Orion/MPCV manufacturing and assembly so the spacecraft is ready for launch vehicle integration for the Exploration Flight Test 1 (EFT-1).

PERFORMANCE REPORTING AND PLANNING

Reported Multi-Year Performance

Multi-Year Performance Goal 1.3.2.1: Develop technologies that will enable biomedical research and mitigate health risks associated with human space exploration missions.

FY11
Green
FY12
Green

The Human Research Program (HRP) made several significant contributions to the knowledge base for safer exploration missions in FY 2012. A NASA research project, Man-Machine Integration Design and Analysis System–Function Allocation Simulation Tool (MIDAS-FAST), demonstrated software that enables users to predict the effects of different types of robotics system automation on performance. This project contributes to mitigating the risks associated with human automation–robotic interaction. In addition, HRP met a critical milestone with the submission of the final report on the Sleep-Wake Actigraphy Study–Risk Characterization and Monitoring Tools for Spaceflight Environments of Shuttle and ISS. This investigation is the largest study of sleep in spaceflight for both short and long-duration missions, and directly addresses HRP spaceflight-related research gaps by providing objective data collected from ISS crewmembers (3,201 ISS in-flight days) and astronauts on 80 Shuttle missions, encompassing 26 STS flights (1,066 STS in-flight days).

Also, in August 2012, HRP selected 12 proposals for funding through the 2012 NASA Research Announcement (NRA) for Ground-Based Studies in Space Radiation. NASA and the National Space Biomedical Research Institute received 157 proposals in response to the NRA for Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions.

Update to Multi-Year Performance Goal	
FY13 Update	This performance goal remains the same in FY13.
FY14	Conduct biomedical research and demonstrate technologies that will mitigate health risks associated with human space exploration missions.

Reported Annual Performance					
ERD-12-1: Develop and release two NASA Research Announcements that solicit from the external biomedical research community the highest quality proposals to mitigate space human health risks.					
Contributing Theme:		Exploration Research and Development			
Contributing Program(s):		Human Research			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**None**	**ERD-11-4 Green**	**ERD-12-1 Green**
Planned Annual Performance					
FY13 Update	ERD-13-1: Complete two ISS physiological flight experiments that define requirements for maintaining astronaut health for long-duration missions.				
FY14	ERD-14-1: Complete two space radiation national research campaigns at the NASA Space Radiation Laboratory at Brookhaven National Laboratory.				

PERFORMANCE REPORTING AND PLANNING

Reported Multi-Year Performance

Multi-Year Performance Goal 1.3.2.2: Perform research to ensure that future human crews are protected from the deleterious effects of space radiation.

FY11
Green
FY12
Green

In August 2012, HRP selected 12 proposals for funding through the 2012 NASA Research Announcement for Ground-Based Studies in Space Radiation. Acute radiation risks from large solar particle events are a major risk to crew health. NASA uses a specific software tool to evaluate acute risks, support mission operational planning and spacecraft shielding design. NASA released the Version 2 beta of this tool in May 2012 and the final version in June 2012.

Update to Multi-Year Performance Goal	
FY13 Update	No performance goal in FY13.
FY14	No performance goal in FY14.
Comments	The Human Research Program will continue to pursue this important area of research. For FY 2014, NASA is reducing the number of performance goals dedicated to biomedical research for human spaceflight and focusing and strengthening the remaining performance goal. The work planned toward this performance goal, dedicated to protecting crews from space radiation, has been realigned to a broadened performance goal 1.3.2.1. To reflect this, NASA moved the subordinate APGs to this performance goal.

Reported Annual Performance					
ERD-12-2: Release Acute Radiation Risk Model Version 2 to assess effects of solar particle events during exploration missions.					
Contributing Theme:		Exploration Research and Development			
Contributing Program(s):		Human Research			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**None**	**ERD-11-5 Green**	**ERD-12-2 Green**
Planned Annual Performance					
FY13 Update	No annual performance goal in FY13.				
FY14	No annual performance goal in FY14.				

Reported Multi-Year Performance

Multi-Year Performance Goal 1.3.2.3: Develop exploration medical capabilities for long-duration space missions.

FY11
Green
FY12
Green

In July 2012, the Integrated Cardiovascular experiment was able to collect for the first time exercise echocardiography data while a crewmember was exercising on the Cycle Ergometer with Vibration Isolation and Stabilization (CEVIS) in the U.S. Laboratory. The portable Ultrasound 2 hardware made this possible. The integrated monitoring and diagnostics capabilities of CEVIS and Ultrasound 2 are a significant advance in cardiac research and diagnosis for space medicine.

In January 2011, the original ultrasound aboard ISS failed. HRP was developing Ultrasound 2, which was scheduled for launch to ISS in FY 2012. The HRP teams at the Ames Research Center and Johnson Space Center accelerated the development and testing, and

	launched the device on STS-135 in July 2011.

Update to Multi-Year Performance Goal	
FY13 Update	No performance goal in FY13.
FY14	No performance goal in FY14.
Comments	The Human Research Program will continue to pursue this important area of research. For FY 2014, NASA is reducing the number of performance goals dedicated to biomedical research for human spaceflight and focusing and strengthening the remaining performance goal. NASA realigned the work planned toward this performance goal, dedicated to exploring medical capabilities for long-term space flight, to a broadened performance goal 1.3.2.1. To reflect this, NASA moved the subordinate APGs to this performance goal.

Reported Annual Performance					
ERD-12-3: Deliver the next-generation space biomedical ultrasound device to enhance the Human Research Facility capability on the ISS through 2020.					
Contributing Theme:		Exploration Research and Development			
Contributing Program(s):		Human Research			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**9AC5 Yellow**	**10AC07 Green**	**ERD-11-6 Green**	**ERD-12-3 Green**
Planned Annual Performance					
FY13 Update	No annual performance goal in FY13.				
FY14	No annual performance goal in FY14.				

Reported Multi-Year Performance

Multi-Year Performance Goal 1.3.3.1: Prioritize the knowledge of hazards, opportunities, and potential destinations for human space exploration that will be of use to future operations of an integrated architecture for human space exploration.

FY11
None
FY12
Green

In collaboration with the Planetary Science Division of NASA's Science Mission Directorate, the Advanced Exploration Systems Program developed and presented a preliminary plan on the development of human spaceflight architectures to the Office of Management and Budget on October 24, 2011. NASA identified areas in which more knowledge was required for each potential human destination (the Moon, cis-lunar space, near-Earth asteroids, and Mars). NASA then developed a plan to vet these strategic knowledge gaps with the science and exploration communities and to prioritize them. NASA's will use the skills and knowledge gaps as a basis for investment decisions made by multiple stakeholders. By developing an integrated set of priorities, NASA will leverage mission opportunities, data, and the talents of both the exploration and science communities to enable human missions.

Update to Multi-Year Performance Goal	
FY13 Update	This performance goal remains the same in FY13.
FY14	This performance goal remains the same in FY14.

PERFORMANCE REPORTING AND PLANNING

Reported Annual Performance					
ERD-12-4: In collaboration with the Planetary Science Division, develop a plan to return data that will support the selection of destinations and reduce risk for future human space exploration missions.					
Contributing Theme:		Exploration Research and Development			
Contributing Program(s):		Advanced Exploration Systems			
FY07	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
None	**None**	**None**	**None**	**None**	**ERD-12-4 Green**
Planned Annual Performance					
FY13 Update	ERD-13-2: Develop a set of strategic knowledge gaps on potential destinations for human spaceflight, facilitate external advisory group review of the gaps and document the results in the Global Exploration Roadmap.				
FY14	ERD-14-2: Complete the Preliminary Design Review (PDR) for a robotic precursor mission to prospect for lunar ice.				

Reported Annual Performance	
No annual performance goal in FY12 or trended performance.	
Contributing Theme:	Exploration Research and Development
Contributing Program(s):	Advanced Exploration Systems
Planned Annual Performance	
FY13 Update	No annual performance goal in FY13.
FY14	ERD-14-3: Fabricate and test a proof of concept asteroid capture mechanism.