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National Aeronautics and Space Administration
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John F. Kennedy Space Center
Kennedy Space Center, Fla. 32899
FS-2005-04-011-KSC

Mission STS-114

Return to Flight mission to test new safety techniques, add to Station's science capabilities

Space Shuttle Discovery's mission STS-114, designated the Return to Flight mission and Logistics Flight 1, will test new equipment and procedures to increase the safety of the Shuttle and deliver vital spare parts, water and supplies to the International Space Station (ISS).

The historic mission is the 114th Space Shuttle flight and the 17th U.S. flight to the ISS. Seven crew members, including an astronaut from the Japan Aerospace Exploration Agency, and several elements will make the journey to the ISS aboard Discovery.

The most important goals of the mission include inspecting on orbit for the first time all of the Reinforced Carbon-Carbon (RCC) heat protection material on Discovery's wing leading edge panels and sending data from the 176 wireless impact sensors mounted inside the wing panels for evaluation on the ground.

Also, mission specialists will practice repair techniques on RCC and tile samples during a spacewalk in the payload bay.

The Canadian-built Orbiter Boom Sensor System, comprising two types of lasers and a high-resolution television camera on the boom's end, will be carried in the payload bay. Prior to arrival at the ISS, mission specialists will attach the boom to the end of the Orbiter's robotic arm and maneuver it to inspect the vehicle on orbit for any damage.

As Discovery nears the Station for docking, the Expedition crew will view the underside of the orbiter at a distance of 600 feet and take photographs.

The Multi-Purpose Logistics Module named Raffaello, built by the Italian Space Agency, will be carried in the Space Shuttle's payload bay. Raffaello will be outfitted with 11 racks containing supplies, hardware, equipment and the Human Research Facility-2 (HRF-2) rack for transfer to the Station.

After docking with the Station, the crew will berth Raffaello to the Station and transfer the supplies and the HRF-2 into the Station. Old equipment, supplies and hardware will be transferred to racks inside Raffaello for return to Earth.

Additional elements aboard Discovery for delivery to the Space Station are the External Stowage Platform-2, equipped with spare part assemblies, and the Lightweight Multi-Purpose Experiment Support Structure, containing a Control Moment Gyroscope to replace one that failed on the ISS.

During two spacewalks, mission specialists will install the External Stowage Platform-2 on the U.S. airlock Quest and replace a failed gyroscope with the new one.

The HRF-2, composed of additional biomedical instrumentation and research capabilities, will join the HRF-1, which was delivered to the Station in May 2001.

Biomedical instrumentation in HRF-2 includes the Pulmonary Function System for use in conjunction with exercise equipment to obtain measurements of astronauts' aerobic capacity and cardiac output.

Also in the HRF-2 is a refrigerated centrifuge that will separate biological substances of differing densities, and a Space Linear Acceleration Mass Measurement Device that will help determine the on-orbit body mass of the crew members using a controlled force and acceleration rate. An upgraded computer workstation will be used for data handling and storage.

The Space Shuttle Return to Flight mission is the beginning of a new era in human exploration and the first step in making the Vision for Space Exploration a reality.

The Crew

Eileen M. Collins will serve as commander on her fourth Space Shuttle flight and second flight as commander. She served as pilot on mission STS-63 (1995) and mission STS-84 (1997), and was commander on mission STS-93 (1999). She will command the crew and mission on orbit. Collins will dock Discovery with the ISS and fly the orbiter to its landing at KSC.

Collins was born in Elmira, N.Y. and is married. She earned a Bachelor of Arts degree in mathematics and economics from Syracuse University. She also earned a Master of Science degree in operations research from Stanford University and a Master of Arts degree in space systems management from Webster University. She has logged more than 5,000 hours in 30 different types of aircraft.

James M. Kelly will serve as pilot on mission STS-114, his second Space Shuttle flight. He served as pilot on mission STS-102 (2001). Kelly's primary responsibility on the upcoming mission is to serve as backup to Collins. He will operate the orbiter's robotic arm during vehicle inspections and operate the Station's robotic arm during all three spacewalks, as well as during the transfer and retrieval of the MPLM.

Kelly was born in Burlington, Iowa. He is married and has four children. He received a Bachelor of Science degree in astronautical engineering from the U.S. Air Force Academy and a Master of Science degree in aerospace engineering from the University of Alabama. He has logged more than 2,500 flight hours in more than 35 different aircraft.

Soichi Noguchi, with the Japan Aerospace Exploration Agency, will serve as mission specialist 1. This is his first Space Shuttle flight.

Noguchi will take part in three spacewalks during mission STS-114 to demonstrate repair techniques on Thermal Protection System samples, replace a failed Control Moment Gyroscope and install the External Stowage Platform on the ISS.

Noguchi was born in Yokohama, Kanagawa, Japan. He received Bachelor of Engineering and Master of Engineering degrees in aeronautical engineering from the University of Tokyo.

Dr. Stephen K. Robinson will serve as mission specialist 2 on his third Space Shuttle flight. He will be the flight engineer during the launch and landing of mission STS-114. Robinson will also perform three spacewalks with Noguchi to demonstrate repair techniques on Thermal Protection System samples, replace a failed Control Moment Gyroscope, and install the External Stowage Platform-2 on the ISS.

Robinson was born in Sacramento, Calif. He earned a Bachelor of Science degree in mechanical/aeronautical engineering from the University of California at Davis, a Master of Science degree in mechanical engineering from Stanford University, and a doctorate in mechanical engineering, with a minor in aeronautics and astronautics from Stanford University.

Dr. Andrew S.W. Thomas will serve as mission specialist 3 on his fourth Space Shuttle flight. Previously, he flew on mission STS-89 (1998), which was a docking mission with Mir. Thomas served aboard Mir as flight engineer 2 for 130 days and returned to Earth on mission STS-91 (June 1998). Thomas will assist in unberthing the OBSS and attaching it to the orbiter's robotic arm to inspect the vehicle for any damage.

Thomas was born in Adelaide, South Australia. He received a Bachelor of Engineering degree in mechanical engineering, with First Class Honors, and a doctorate in mechanical engineering from the University of Adelaide. He is an Honorary Fellow of the Institution of Engineers, Australia.

Wendy B. Lawrence will serve as mission specialist 4 on her fourth Space Shuttle flight. Lawrence's work on mission STS-114 includes helping to position the orbiter beneath the Space Station to allow ISS crew members to photograph the underside of Discovery.

Lawrence was born in Jacksonville, Fla. She received a Bachelor of Science degree in ocean engineering from the U.S. Naval Academy and a Master of Science degree in ocean engineering from the Massachusetts Institute of Technology and the Woods Hole Oceanographic Institution.

Dr. Charles J. Camarda will serve as mission specialist 5 on his first Space Shuttle flight. Camarda will serve on the rendezvous team with Lawrence and Collins. He will help guide Discovery beneath the Space Station so that ISS crew members can photograph the orbiter.

Camarda was born in Queens, N.Y. He is married and has four children. He earned a Bachelor of Science degree in aerospace engineering from Polytechnic Institute of Brooklyn and a Master of Science degree in engineering science from George Washington University. He received a doctorate in aerospace engineering from Virginia Polytechnic Institute and State University.