International Space Station Expedition 10: 100 Days in Space

January 22 2005

The Expedition 10 crewmembers are marking their 100th day in space today, ending a workweek focused on preparations for their first spacewalk Jan. 26.
Commander Leroy Chiao and Flight Engineer Salizhan Sharipov are scheduled to leave the Pirs Docking Compartment airlock at 2:25 a.m. EST Wednesday. Most of their spacewalk tasks involve outfitting the outside of the Zvezda Service Module.

They will install a work platform, mount a robotics experiment, check vents on systems that help control the Station's atmosphere and install a scientific experiment. After completing the work outside Zvezda, they will move back to Pirs. Outside the docking compartment, they will install an experiment that examines the impact of spaceflight on microorganisms. They are expected to re-enter Pirs and close the hatch about 8 a.m. EST.

Sharipov and Chiao completed one spacewalk prerequisite this morning. Both did the required cardiovascular evaluation exercise using one of the Station's bicycle-like devices. They also did leak, valve and pressure checks on their Orlan spacesuits and the Orlan interface units in Pirs, completed suit communications checks and did a review of the spacewalk plan with flight controllers in Moscow.

Spacewalk activity earlier in the week included spacesuit battery charging Tuesday, as well as preparation of spacewalk hardware and tools. They spent three hours staging equipment and tools on

Wednesday. Yesterday they activated and tested the suits. Both suits have red stripes. Chiao will be distinguishable by a U.S. flag on his shoulder.

The spacewalk will be broadcast live on NASA Television, beginning at 1 a.m. EST Jan. 26. Coverage will continue through the end of the spacewalk.

On Jan. 15 flight controllers raised the Station's altitude by about five-and-one-half miles in a 20-minute reboost using engines on the Progress cargo spacecraft docked at the rear of Zvezda. That was done to put the Station in the proper orbit for the arrival of the next Progress on March 2.

For much of the week, flight controllers conducted vibration and current tests on one of the 600-pound control moment gyros (CMGs) that control the orientation of the Station. The CMGs normally operate at 6,600 rpms, but can be operated at 15 other speeds. The test involved running CMG 2 at each of those speeds for four hours.

The CMGs use solar power. Three of the four on board are functioning, though the Station's attitude could be controlled with two. The CMG, which failed in mid-2002, will be replaced on the next Shuttle mission.

On the science research front, Chiao performed a status check of the Miscible Fluids in Micro Gravity experiment. During his Saturday science program last weekend, Chiao photographed honey and honey/water syringes used to study the viscosity of molten materials. Understanding this is important for everything from designing laboratory experiments to industrial production of materials.

Scientists on Earth have been concerned about crystallization of the honey, which occurred in the last Space Station increment. The

experiment's principal investigator wants to verify the status of the test articles before any operations during this increment. The best way to accomplish this is by photographing the honey-filled syringes for ground review.

The experiment uses fluids with known viscosities such as honey, corn syrup, glycerin and silicone oil. One way to determine viscosity is to measure how long it takes two spheres of liquid to merge into a single spherical drop. On contact, a neck will form between the two drops, increasing in thickness until the two drops become one single sphere.

On Earth, gravity distorts liquid spheres, and drops are too heavy to be supported by strings. Drop distortion should not occur in the Space Station's low gravity environment, and the drops can be held on strings.

Source: NASA