

This Week on ISS

Life for the two crew members on board the International Space Station has been busy this week. They installed a replacement part for an oxygen-generating system, unpacked a recently arrived cargo carrier and disassembled a radiation-detection experiment.

Expedition 11 Commander Sergei Krikalev and NASA station Science Officer John Phillips are scheduled to activate the Elektron oxygen-generation system with its new liquids unit next Monday. The liquids unit was installed Thursday. The Elektron separates oxygen from water for use in the station's atmosphere, but it has not functioned for several months. Adequate oxygen supplies are available on the station from tanks and solid fuel oxygen generators.

The new liquids unit arrived aboard a Progress cargo craft that docked to the complex at 10:42 a.m. EDT last Saturday. The Progress craft brought 2.6 tons of cargo to the station. Krikalev and Phillips began unloading the cargo Sunday.

The Progress brought more than 2,700 pounds of dry cargo to the station, including food, equipment, supplies, clothing and components of scientific experiments. The rest of the cargo included fuel for the station's thrusters, water and oxygen. Krikalev and Phillips worked to unload the Progress throughout the week.

After a light-duty day Monday, the crew transferred Progress cargo and entered the items into the station's computerized, bar-coded inventory management system on Tuesday. Much of Wednesday was devoted to disassembly of the Matroshka radiation experiment, retrieved from the exterior of the station during an August spacewalk, for return to Earth.

A major part of the European Space Agency Matroshka experiment, developed and built in Germany and operated through the German Space Agency's Microgravity User Support Center in Cologne, is a human-torso-like device. It was launched on a Progress in January 2004 and installed on the outside of the Zvezda Service Module the following month.

Its interior is similar in density to a human's, and 20 radiation detectors are mounted in positions of major human organs. Other detectors inside the station also gathered data for transmission to Earth and station computers. The experiment is designed to help researchers better understand the exposure of astronauts, including those making spacewalks, to radiation.

In addition to the Elektron liquids unit replacement, the crew on Thursday set up hardware for the Foot/Ground Reaction Forces during Spaceflight (Foot) experiment. Phillips put on customized Lycra cycling tights for his fifth and final session of the experiment. Foot investigates the differences between use of the body's lower extremities on Earth and in space, as well as changes in the musculoskeletal system during spaceflight.

During the session, Phillips wore the instrumented Lower Extremity Monitoring Suit, or LEMS, which measures joint angles, muscle activity and forces on the feet while exercising. During the final run, a special exercise protocol was used to measure forces Phillips experiences on the cycle ergometer and the Resistive Exercise Device.

Taking force measurements while running through the range of settings with each piece of exercise equipment helps determine the settings necessary to match the forces that bones experience during exercise on Earth. Matching those forces during exercise is critical to reducing the amount of bone lost while in weightlessness.

Also this week, flight controllers and engineers in Houston helped transition to faster advanced portable-computer software aboard the station. They completed the transition Wednesday. Flight controllers also maneuvered station cameras to capture images of Hurricane Ophelia several times this week as it approached the southeast coast of the United States.

Source: NASA

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