

# Success in space: Astronauts pull off broken pump

August 11 2010, By MARCIA DUNN , AP Aerospace Writer

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(AP) -- Spacewalking astronauts relied on brute force Wednesday to remove a broken coolant pump that has hampered operations at the International Space Station.

Their first attempt at emergency repairs to the cooling system was thwarted last weekend by a large ammonia leak.

This time, to everyone's relief, there was no burst of toxic ammonia from a stubborn connector, just a few frozen flakes that drifted harmlessly away.

"That's great news," Wheelock reported.

"That's awesome news," Mission Control agreed.

The urgent repair job is considered one of the most challenging in the 12-year history of the space station. The cooling system is crucial for keeping electronics from overheating, and half of the system was knocked out when the ammonia pump failed 1 1/2 weeks ago.

Science research is on hold and unnecessary equipment is off until the pump can be replaced. Engineers suspect an electrical short in the pump led to the shutdown.

It was five hours into Wednesday's spacewalk before the astronauts succeeded in removing the broken 780-pound pump, about the size of a

bathtub. There was barely time for just a few more chores; a spare pump will be installed during a third spacewalk Sunday. NASA originally anticipated two spacewalks to complete the job, but added another after Saturday's trouble.

"We still have a little ways to go, but it was a great day today," Wheelock radioed.

Making his second spacewalk in five days, Wheelock had to yank the jammed connector back and forth for several seconds before it popped off the broken pump. He shook so hard with his gloved hands that the TV images beamed down from his helmet camera were bumpy and full of static.

"We didn't tell the guys inside to hold on when you did that," Mission Control joked.

Efforts to pry off the jammed connector during Saturday's spacewalk resulted in a major leak of ammonia. Before Wednesday's spacewalk, flight controllers lowered the pressure in the disabled cooling line. That made all the difference.

Caldwell Dyson, who helped her electrician father when she was young, had little trouble unhooking power and data cables on the pump.

"My dad would be proud," she said.

All that paved the way for the unbolting of the failed pump. Wheelock hung on tight to the pump - a boxy 5 1/2 feet by 4 feet by 3 feet - as he was maneuvered away on the end of the space station's robot arm. The pump was secured to a temporary storage location.

"I'm going to say goodbye to my old buddy," Wheelock said, referring to

the pump's troublesome connector.

The spacewalk lasted 7 1/2 hours, just short of Saturday's eight-hour marathon. Wheelock and Dyson had to follow decontamination procedures again before going inside, in case some ammonia specks got on their suits.

Since the July 31 malfunction, the space station has had to get by on a single cooling loop. NASA wants the second line up and running again as soon as possible, in case the first one ends up broken, too. That would leave the orbiting lab in a precarious position, with only a limited amount of time for emergency repairs before the crew would have to abandon ship.

Three Americans and three Russians are on board. Their safety has not been jeopardized by the cooling system trouble, and their comfort has not been compromised as they work and live 220 miles above Earth.

The space station is meant to continue working until 2020. NASA will have to rely on Russia and other countries for crew and cargo transport once the shuttle fleet is retired next year.

Only two shuttle visits remain, in November and February 2011. A third shuttle mission is under consideration for next summer.

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