

# Space station astronauts fall short on repairs

August 7 2010, By MARCIA DUNN , AP Aerospace Writer

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In this image taken from video and made available by NASA astronaut Doug Wheelock, foreground begins the first of two spacewalks to replace a broken ammonia pump Saturday Aug. 7, 2010. (AP Photo/NASA)

(AP) -- A pair of space station astronauts had to hammer loose a stuck connector Saturday during an urgent spacewalk to restore a crucial cooling system, and ran out of time before they could remove a broken pump.

Douglas Wheelock and Tracy Caldwell Dyson went into the [spacewalk](#) hoping to replace the ammonia coolant pump with a spare at the [International Space Station](#). But they were forced to leave the failed pump in place. What's more, a fair amount of ammonia leaked out, forcing them to set aside time to get any traces of the toxic substance off their spacesuits.

The job was considered so difficult - one of the most challenging repairs ever attempted at the orbiting lab - that two spacewalks were ordered up by NASA. Saturday was part one. It was not immediately known whether a third spacewalk might be needed.

Halfway through their lengthy spacewalk, Wheelock and Caldwell Dyson could not get one of the four pressurized ammonia hoses to come off the disabled pump.

"Wow. That thing is not budging," Wheelock told Mission Control.

Caldwell Dyson floated by his side, unable to offer much assistance because of the tight quarters. They were so close their helmets kept bumping against each other.

A bit of ammonia coolant leaked out as the two struggled with the connections. Wheelock said the escaping ammonia resembled tiny snowflakes.

Lagging well behind by this point, the spacewalkers managed to remove three of the four hoses. Wheelock tried once more to disconnect the balky line, banging the jammed button with a special tool. It worked.

Mission Control erupted in applause. "Awesome," Mission Control radioed up.

But the exuberance was dampened by a stream of escaping ammonia. "It's got a pretty good snowstorm there," Wheelock reported.

The astronauts managed to stop the leak when they plugged the troublesome connector back in. There was time for little else as the spacewalk neared the seven-hour mark. They headed back to the air lock, and inspected their suits and equipment for ammonia crystals.

None was found, but the pair still had to go through all precautions, stretching the spacewalk to eight hours and three minutes. NASA said it was the sixth-longest spacewalk ever.

The ammonia pump shut down last weekend and knocked out half of the space station's cooling system. The pump is supposed to push ammonia coolant through the lines on the right side of the complex and prevent equipment from overheating. To cope with the failure, the six-person crew had to turn off all unnecessary equipment and halt science experiments.

The cooling line on the left side - unaffected by the trouble - has had to manage everything.

Engineers worked nonstop over the past week to come up with the emergency repair plan, which involved replacing the pump. In addition, astronauts in Houston rehearsed every step of the spacewalk while submerged in NASA's huge training pool.

Although space station managers knew an ammonia pump would fail one day, they did not expect it to happen so soon in the 12-year life of the complex. The broken pump had been in operation since 2006.

Wheelock could find nothing wrong with the pump - about the size of a bathtub - and he saw no signs it had been hit by micrometeorites or other debris.

Each pump is a boxy 5 1/2 feet by 4 feet by 3 feet and has a mass of 780 pounds. The new pump, an on-board spare, presumably will be installed on the second spacewalk planned for Wednesday.

NASA said the breakdown is serious but has not endangered the crew, and the one functional cooling loop has kept the space station stable.

Additional breakdowns could leave the station in a precarious situation, however, and that's why managers wanted to get the broken line working again as soon as possible.

Saturday's spacewalk was the first by Americans, without a shuttle present, since 2008.

The crew includes three Americans and three Russians. Caldwell Dyson has been on board since April, and Wheelock since June.

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Online:

NASA: <http://www.nasa.gov/mission-pages/station/main/index.html>

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