

# Astronauts take 3rd, final spacewalk; valve stuck

April 13 2010, By MARCIA DUNN , AP Aerospace Writer

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In an image made from a NASA television broadcast, Rick Mastracchio and Clayton Anderson work in the payload bay of the space shuttle as they prepare to load a virtually empty storage tank to take back to earth for a refill Tuesday April 13, 2010. (AP Photo/NASA)

(AP) -- A pair of spacewalking astronauts finished installing a fresh storage tank outside the International Space Station on Tuesday, but a stuck valve was threatening to jeopardize half of the cooling system.

No sooner had Rick Mastracchio hooked up the fluid valves for the new ammonia tank on the third and final spacewalk of shuttle Discovery's flight, then flight controllers encountered the valve trouble in a separate pressurizing unit.

Flight director Ron Spencer said the problem needs to be resolved as soon as possible and that spacewalking repairs may be needed sometime after Discovery leaves this weekend. The problem is exasperated by the fact that a period of intense sunlight on the space station is fast approaching, and the ammonia will be expanding more than usual with the added heat.

The stuck valve is in a nitrogen tank assembly on the right side of the space station. Nitrogen is used to pressurize the ammonia, which circulates through large radiators. Without that capability, half of the station's electronics eventually might have to be turned off. The [cooling system](#) on the left side - left alone on this flight - is operating just fine. For now, so is the one on the right side.

"We do have a couple tricks up our sleeves" to remotely free the valve, Spencer told reporters. He said a spacewalk would be a last resort and that it was too soon to know when a decision might need to be made.

The seldom-used valve cannot be replaced alone. The entire nitrogen assembly would have to be swapped out. Fortunately, two spares already are at the space station.

As engineers struggled with the nitrogen valve, Mastracchio and Clayton Anderson were dealing with a stubborn bolt on the old ammonia tank, which had been removed on the previous spacewalk.

In what almost seems to be a common occurrence on this flight, one of the four bolts on the tank would not engage. Mastracchio and Anderson were trying to secure the boxy, 1,300-pound tank in Discovery's cargo bay when the problem cropped up. It appeared to be a misalignment, and they pulled out a pry bar to try to fix it. The pry bar wasn't needed, but a torque-increasing device was.

Mission Control told the astronauts that they had to drive in all four bolts all the way, one way or another.

"How you guys feeling?" asked shuttle pilot James Dutton Jr.

"I'll feel better when we get this thing bolted in," Mastracchio said. "No kidding," Anderson added.

When Mastracchio finally drove in the bolt, astronaut Dorothy Metcalf-Lindenburger shouted, "Now I can finally say good job, we have the ammonia tank in the payload bay." Earlier, she was too quick in offering congratulations.

NASA wants to return the old tank to Earth next week, in order to fill it and fly it back up this summer as a spare.

The space agency is trying to stockpile as many big parts up there as possible. Only three shuttle missions are left after this one, and there will be limited room on the much smaller Russian, European and Japanese cargo ships that will be supplying the station until its projected end in 2020.

President Barack Obama will outline his objectives for NASA's human spaceflight program Thursday during a visit to Kennedy Space Center. He's already axed his predecessor's effort to return astronauts to the moon.

The ammonia and nitrogen hoses for the new tank should have been connected during Sunday's spacewalk. But the astronauts had trouble attaching the new tank to the space station because of a stubborn bolt, and some chores had to be put off. A couple other tasks were scuttled Tuesday because of all the time spent on the latest troublesome bolt.

Mastracchio and Anderson wrapped up the 6 1/2-hour [spacewalk](#) with some prep work for the next shuttle visit, scheduled for just a few weeks from now. Down at the Florida launch site, Atlantis was moved out of its hangar for the short trip to the Vehicle Assembly Building, the last stop before the pad. NASA temporarily parked the shuttle outside in the sunshine so workers could snap pictures.

It will be the last flight of Atlantis. Liftoff is targeted for May 14.

The spacewalkers indulged in some picture-taking of their own.

"Look over here," Anderson told Mastracchio. "Oh, baby, you're going to want to take this one to the grandkids."

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Citation: Astronauts take 3rd, final spacewalk; valve stuck (2010, April 13) retrieved 11 September 2024 from <https://phys.org/news/2010-04-astronauts-3rd-spacewalk-valve-stuck.html>

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