

NASA developing spacesuit with built-in toilet

A spacesuit that astronauts will wear on the Orion spacecraft. | Photo Credit: [NASA](#)

NASA scientists are developing a new spacesuit that includes a waste-disposal system, which will allow astronauts to remain in their spacesuits for up to six days in case of emergencies.

The new suits, called the Orion Crew Survival Systems Suits (OCSSS), will be worn by astronauts on NASA's Orion spacecraft, which will carry humans beyond low Earth orbit.

While the Orion will be equipped with a toilet, NASA is making contingency plans in case of emergencies, including the possibility that the Orion capsule depressurises and the astronauts have to remain in their suits to survive.

NASA wants astronauts to be able to survive in their suits for up to six days.

Existing suits come equipped with diapers called maximum absorbency garments. Astronauts do not remain in their suits for more than 10 hours at a time. Once out of the spacesuit, astronauts use the onboard toilets.

There were no toilets on the spacecraft that carried humans to the Moon.

For urine collection, the all-male crew members wore catheters that fit over the penis like a condom, with a tube at the end to collect the liquid, which was pulled into a bag attached to the outside of the suit.

However, a glaring problem that was never solved is how to make an in-suit, urine-collection systems for women. Female astronauts used the diaper system and onboard toilet.

"For females, it gets a little harder because of the geometry of a person's body, and then you have to deal with issues like pubic hair," Johnson said.

Pubic hair poses a challenge because liquid tends to glom onto it in microgravity. The main concern is liquid lingering in that area and causing a skin breakdown. The system also has to be secured in place, and pubic hair can also make it difficult to use a sticky attachment mechanism.

Researchers have to take into consideration things like how the waste-disposal system can operate while a woman is on her period.

The female urine-disposal system is not fully developed yet, and some aspects of it are proprietary, Johnson said, so she can not release all the details.

However, the general design is similar to the tube system used by female fighter pilots to relieve themselves during long flights, or members of the military who may not be able to stop a task to relieve themselves.

The device essentially has to be the size of a sanitary napkin, to encompass an entire area. PTI MHN 21021315

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