

NASA Exploration Toilet Hardware Status and Crew Feedback from ISS Artemis-2 Demonstration

The Universal Waste Management System (UWMS), ISS operational nomenclature “Toilet”, was initially installed on the International Space Station (ISS) in 2020 with final installation completed in 2021. Technical progress continues to be made with each on-orbit operation and will ultimately culminate with nominal US crew use of the hardware on ISS. During 2023, the Artemis-2 Demonstration was started, and this paper discusses issues encountered, on-orbit troubleshooting, subsequent ground failure investigation and proposed repairs as well as near-term plans to resume the Artemis-2 demo. Also discussed is an update to the commercial-off-the-shelf (COTS) Conductivity Monitor which is planned to be flown for the resumption of the demo along with additional UWMS hardware and Toilet Integration Hardware (TIH). An updated design of the commode seat and fecal bag for Artemis-2 UWMS will be demonstrated on ISS and a summary of the hardware is included in the paper. Use of the hardware during the first days of the aborted demonstration by crewmembers and feedback received is summarized as well as hardware updates resulting from that feedback. The paper will also provide an overview of the demo results to date that inform the Orion-installed UWMS unit and future manifesting of consumables for both Orion and ISS.