Advancements in Logistics Reduction for Exploration Missions

Management of logistics on exploration missions includes both looking for ways to minimize the quantities, mass and volume of various consumables, supplies, spares and equipment as well as ways to minimize the crew time needed for locating and handling those items. Also included are ways to minimize the waste, handling and resultant products from the processes of maintaining a crew on these missions. The Logistics Reduction project encompasses technologies for management of waste, trash, autonomous logistics, and clothing. This paper provides a status of work in these areas including recent accomplishments and challenges encountered. Future objectives will also be covered along with the work currently in progress. Specifically, the paper will cover technologies in waste management, namely, the Universal Waste Management System (UWMS) or exploration toilet and work on an alternative waste collection container, the Alternate Fecal Canister. Trash management technologies work on the Trash Compaction and Processing System (TCPS) and Trash to Gas (TtG) is summarized with progress to date as well as information on how Jettison as an option is related. Progress and summary of recent accomplishment on the RFID (Radio Frequency ID) Enabled Autonomous Logistics Management (REALM) and the Autonomous Logistics (AL) technologies is detailed. Advanced Clothing System (ACS) and work in the area of Systems Engineering and Integration (SE&I) is also included. Status of the technologies, accomplishments and how the focus areas inform program decisions will be addressed.