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HUMAN FACTOR INVESTIGATION OF WASTE PROCESSING SYSTEM FOR HI-SEAS 4 MONTH
ANALOG MISSION IN SUPPORT OF NASA'S LOGISTICS REDUCTION AND REPURPOSING:
TRASH TO GAS

Abstract

NASA's Logistics Reduction and Repurposing (LRR) project is a collaborative effort in which NASA is tasked with reducing total logistical mass through reduction, reuse and recycling of various wastes and components of long duration space missions and habitats. Trash to Gas is a sub task to LRR with efforts focused on development of a technology that converts long duration space mission material, human and food waste into high-value products like life support oxygen and water, rocket fuels, raw material production feedstocks, and other energy sources. Technology alternatives are being developed for converting trash and other waste materials into high-value products such as methane and water. The reuse of discarded materials is a critical component to reducing overall mission mass. The 120 day Hawaii Space Exploration and Analog Simulation provides a unique opportunity to answer questions regarding crew interface and system analysis for designing and developing future flight-like versions of a Trash-to-Gas system. Basic human factor statistics on crew time spent for preparing trash for operation, delivering trash to the reactor system and mimicking operations of the trash reactor system will be logged in various tasks with two main goals: evaluate the crew interactions with waste disposal systems and determine the waste generation profile over the course of the mission. This paper will discuss the human factors behind long duration mission waste processing for conversion to high-value products and insight for developing a more flight-like system.