

# MULTIPURPOSE CARGO TRANSFER BAG

## Advanced Exploration Systems Logistics Reduction Project

### SIGNIFICANT ACTIVITIES

#### PIONEERING SPACE & LIFE ON EARTH

Located in Node 3 on ISS, the T2 treadmill reaches the noise hazard limit of 80 dBA when operated at high speeds. As such, the T2 has been added to the Noise Hazard Inventory, and hearing protection has become mandatory when the treadmill is used above 10 mph per the Noise Constraint Flight Rule. An acoustic MCTB has been designed with a material layup specifically designed to absorb the sound generated by the T2 treadmill. After serving their primary purpose of carrying logistics, the MCTBs will be reconfigured to flat panels and attached in a dual layer to two walls in proximity to the treadmill. Modelling data shows that this implementation could decrease the sound level by 2-3 dBA. Note that since dBA is measured on a logarithmic scale, a 3 dBA reduction is a halving of the sound energy.



The Logistics Reduction (LR) project within the Advanced Exploration Systems (AES) program is tasked with reducing logistical mass and repurposing logistical items. Multipurpose Cargo Transfer Bags (MCTB) have been designed such that they can serve the same purpose as a Cargo Transfer Bag, the suitcase-shaped common logistics carrying bag for Shuttle and the International Space Station. After use as a cargo carrier, a regular CTB becomes trash, whereas the MCTB can be unzipped, un-snapped, and unfolded to be reused. Reuse ideas that have been investigated include partitions, crew quarters, solar radiation storm shelters, acoustic blankets, and forward osmosis water processing.

### INNOVATION PERSPECTIVE

The MCTB project can greatly reduce the amount of trash for Exploration missions.

### PARTNERSHIPS/HIGHLIGHTS

The MCTB team has worked with the Acoustic Office to determine the optimal material layup of an acoustic MCTB to absorb the sound of the ISS T2 treadmill. In addition, team has collaborated with the RadWorks Storm Shelter team at NASA-Langley to infuse their storm shelter designs with MCTBs.

### INFUSION POTENTIAL

This technology may be used on any vehicles including ISS, Orion, and future deep space vehicles to repurpose logistics items, reduce overall logistics mass and volume, and reduce trash.

### PROJECT MANAGEMENT

PM: EC/James Broyan, 281-483-9351 james.l.broyan@nasa.gov

Task Lead: EC/Shelley Baccus, 281-244-0907 shelley.baccus-1@nasa.gov