

Suited User Incident Tracking System

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INTRODUCTION

The Suited User Incident Tracking System (SUITS) tracks all suited exposures during terrestrial analog simulations and trainings with the objective of recording any related issues, pains, or discomforts that arise from the exposure. This information is vital for informing where, how, and why issues are occurring during suited extravehicular activity (EVA) training and operations. The outputs of SUITS will be the foundation for the newly formed Suited Anomaly Assessment Team (SAAT) which consists of a broad range of EVA stakeholders including suit engineers, biomechanists, ergonomists, flight surgeons, athletic trainers, and physiologists. This team has been formed to provide robust, wholistic solutions to suit anomalies and issues identified by SUITS.

METHODS

SUITS data collected from September 2017 to June 2022 was analyzed for issue frequency and severity for each body location and plotted to visualize where issues were occurring. Clustering techniques using a k-modes approach were also applied to the data set to generate profiles of populations that experienced issues in the suit and populations that did not.

RESULTS AND DISCUSSION

A key finding identified by the SUITS analysis was that suited issues translate from predominantly upper body areas in microgravity space suits and associated analog simulations to lower body areas in planetary space suits and analog simulations. In addition, specific injury frequency and severity metrics were identified that will help drive requirements for commercially provided space suits.

The SAAT will continue to meet on a biannual basis to identify trends in issues and injuries from the SUITS database to evaluate and develop solution strategies where needed for the purposes of suit design, EVA operations optimization, injury characterization and mitigation, and personalized improvements for human-suit interactions.