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EXPLORATION OF THE FUTURE: SPACESUIT DESIGN AND OPTIMIZATION

Abstract

The Primary Life Support System (PLSS) and the Extravehicular Activity Mobility Unit (EMU) represent elements of the existing spacesuit design that have become legacy components; icons against the backdrop of interplanetary exploration. Proposed is a study of current and legacy systems to identify areas of possible performance increase, cost reduction, and reliability and safety improvements. Zero Point Frontiers is working with NASA to evaluate 21st century manufacturing methods and holistic software-derived development methods surrounding the PLSS design and operations. Such an approach requires transformative drivers, including additive manufacturing to help the strategic NASA roadmap for beyond-LEO exploration.

As the sole means of life support for EVA astronauts, there are currently sixteen PLSS units in existence with an obsolete vendor chain, and antiquated production processes. The replacement cost for a 100 lbm human spaceflight rated PLSS is 20–40M. *Long-term outcomes of this work will provide dramatic reductions in the cost of the*