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SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Technologies for Future Space Transportation Systems (5)

Author: Dr. Melissa Sampson
United Launch Alliance LLC (ULA), United States

THE NEXT FRONTIER: TRANSPORTATION FOR THE CISLUNAR MARKETPLACE

Abstract

United Launch Alliance (ULA) is currently developing new technologies to deliver reliable, regular, flexible transportation, creating the highway to the cislunar marketplace for the world. Cislunar space is a significant growth area for global, commercial space activities. Within thirty years, 1,000 people can be permanently working and living in space. Cislunar habitats, in space manufacturing, and off Earth mining can quickly become commonplace as industry, academia and government capitalize on cislunar activities. There is a vast frontier waiting to be tapped by science, manufacturing, mining, research, and technology, all enabled by transportation innovations.

This paper will describe various transportation elements in development, such as ACES (Advanced Cryogenic Upper Stage) and Integrated Vehicle Fluids (IVF). ACES will be paired with the new Vulcan Booster, delivering significantly higher performance at a lower recurring cost, with almost 3x the propellant capacity and 4x the thrust of the current Centaur. Most notably, the IVF subsystem enables long duration missions, more burns and added payload power in conjunction ACES. The unique combination of ACES and IVF will allow delivery of payloads to L1, low lunar orbit or an insertion orbit without a kick stage. Propellant extracted from the Moon can refuel ACES in cislunar space, making ACES reusable and available for a variety of functions, e.g. propellant delivery to LEO from L1. Development of ACES and IVF will connect Low Earth and Geostationary Orbits with Earth Moon L1 and Low Lunar Orbit, enabling the transportation for the cislunar marketplace.