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EXTENSIBILITY OF SOFTGOODS TECHNOLOGY FOR THE LUNAR SURFACE

Abstract

Sierra Space is a leading commercial space company at the forefront of innovation and the commercialization of space in the Orbital Age®. With a rich heritage of over 30 years in developing space flight hardware, Sierra Space has built an impressive portfolio of more than 4,000 space systems, subsystems, and components for over 500 space missions, including notable ventures to Mars and other celestial bodies.

Sierra Space is revolutionizing space transportation with Dream Chaser®, the world's only commercial spaceplane, and is redefining the future of space destinations with LIFE^{TM}, their inflatable and expandable space station technology. The development and maturation of LIFE^{TM} has provided them with unique insights into the system of systems required to operate off-Earth commercial infrastructure. While initially designed for Low Earth Orbit applications, LIFE^{TM} is highly adaptable for safe, long-term human habitation in cislunar, lunar surface, and deep space domains. This innovative and disruptive technology, along with its associated subsystems, can support commercial, government, and international customers with minimal configuration changes.

Sierra Space has achieved remarkable successes during structural certification testing in 2023, surpassing the necessary requirements and leading the industry in the development of this disruptive technology. Their inflatable and expandable structures have demonstrated exceptional robustness and reliability, establishing them as a trailblazer in this transformative field. This paper will discuss the current Softgoods certification activities being undertaken by Sierra Space, and its applicability for efforts on the lunar surface.