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THE FUTURE OF HUMAN EXPLORATION STARTS NOW - SIERRA SPACE'S KEYS TO
ENABLING SUSTAINABLE HUMAN SPACE EXPLORATION**Abstract**

Sierra Space has been highly active and is a strong supporter of the human exploration activities especially commercialization of Low Earth Orbit (LEO), the Gateway development and lunar surface operations, and the challenges and technologies needed to go to Mars. Through our multiple NASA Next Space Technologies for Exploration Partnership (NextSTEP-2) contracts we are continuing development of technical, programmatic and operational concepts for the Artemis initiatives. Additionally, we are developing many of the specific technologies needed to achieve these multiple exploration goals. We have completed initial studies and prototype build for our LIFE habitation system and are furthering development of human habitation systems for Gateway, lunar surface and Mars transit.

Sierra Space considers operations in cis-lunar space to be essential for qualification, demonstration, and, in certain cases, development of the technologies critical for human planetary exploration and sustained exploration of the Moon. NASA's existing plans for the Gateway in Near Rectilinear Halo Orbit (NRHO) provide essential opportunities for long life demonstration of these technologies in relevant deep space environments. Additionally, in developing this new human exploration model a unique opportunity exists to create a broad and robust commercial market both in on-orbit service providers and technology development to support long deep space human missions as well as both human and autonomous surface missions. In this paper we present specific technical challenges and the enabling technology and infrastructure development necessary to sustain lunar and Mars exploration. Both short and long-term program planning for missions and technology are presented along with proposed solutions for the logistics and scheduling challenges to meet the multiple exploration objectives.