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NASA'S ARTEMIS HUMAN LANDING SYSTEMS: ENABLING LUNAR EXPLORATION

Abstract

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On March 26, 2019, in keeping with Space Policy Directive-1, NASA was charged with landing the first woman and the next man on the South Pole of the Moon by 2024, followed by a sustained presence on and around the Moon by 2028. NASA's Human Landing System (HLS) Program is responsible for the transportation in deep space to carry humans to and from the surface of the Moon, to be designed and developed by American companies for NASA's Artemis lunar exploration program. On April 30, 2020, NASA announced the awardees for NASA's Human Landing System contracts under Appendix H of the NextSTEP-2 Broad Agency Announcement: A Blue Origin-led team including Lockheed Martin, Northrup Grumman, and Draper; Dynetics (a Leidos company); and SpaceX. The companies began work in a multi-month base period during which NASA teams will work with the companies to streamline requirements, to establish standards and methods, to review required products and to share the NASA's expertise in human spaceflight systems development. Following the base period, which ends in the spring of 2021, NASA will determine which company or companies will develop Artemis human landing systems for the initial demonstration missions, including the goal of landing on the Moon in 2024.

This paper examines how the Human Landing System program is at the center of NASA's Artemis lunar exploration program, designed to yield groundbreaking science, develop and utilize lunar surface resources and leverage the Moon as a proving ground for future Mars missions. While achieving the 2024 goal requires a focus on speed and the use of mature technologies, planning toward sustained operations to and from the lunar surface requires a focus on reliability and reusability.