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# STRATEGY FOR THE MOON: ORIGINS AND DESIGN OF NASA'S HUMAN LANDING SYSTEM PROGRAM

**Abstract**

To fulfill a central objective of the Artemis program, the agency is now developing the capabilities to land humans on the Moon for the first time in over half a century. The agency was informed by input from stakeholders in the U.S. Executive and Legislative branches, including guidance in United States National Space Policy to "Lead an innovative and sustainable program of. . . space exploration with commercial and international partners to enable human expansion across the solar system and to bring back to Earth new knowledge and opportunities." Accordingly, NASA's Human Landing System (HLS) program established a highly innovative series of procurements designed to draw the best from both NASA and U.S. industry to develop lunar lander spacecraft that ensure crew safety and mission success, while also meeting agency and stakeholder requirements for cost and schedule.

Building on lessons from previous NASA programs as well as market research with U.S. industry, NASA's HLS team formulated a program and procurement strategy focused on establishing clear requirements for system functions and performance, safety, and certification, while providing industry the latitude to propose its own designs and innovative approaches. NASA stipulated that the companies would own their spacecraft, encouraging industry to use the landers and supporting architecture for commercial purposes in addition to NASA missions. NASA employed an intentional, balanced approach to sharing risk between the government and industry. Features of the HLS procurements include firm-fixed contracts, performance-based payment milestones and schedules, and special schemes for data rights, liability, and

tailoring of design, construction, and health and medical standards. Tight engagement between NASA and HLS contractors is assured via set contractual provisions for both government insight and technical collaboration.

By executing this strategy for developing lander spacecraft and enabling Artemis missions, the HLS program has established a new paradigm for public-private partnering in deep space exploration. As such, the HLS program is a leader in NASA's execution of new ways of doing business to meet the agency's lunar exploration objectives, stimulate the commercial space industry, and maximize public value.