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HABITAT EXTENSIBILITY TO THE LUNAR SURFACE AND MARS

**Abstract**

Through an international effort, multiple space agency and industry partners are defining concepts to extend human presence in lunar space and beyond to Mars. Architectures for lunar exploration must provide flexibility and resiliency to meet the objectives of multiple partners and demonstrate technologies for future missions. Common designs and parts accelerates advancement and reduces future development costs. Evolution of heavy lift capability enables expansion and extension of mission capability. NASA can maximize returns through careful technology investment and planning for early system demonstration and evolution. A thoughtful habitation development plan will provide a path through all future deep space habitats, from the International Space Station to the surface of Mars, which leverages technology development at each step and maximizes cost effectiveness. Boeing continues to develop, mature, and refine exploration habitation architectures that create firm foundations for sustained deep space exploration and strive to be resilient as future mission details evolve. These architectures are based around the capabilities of the SLS for heavy lift and Orion for crew transport, which includes the capability to deliver both crew and cargo to cislunar space in a single launch. The architectures strive to mature promising technologies and operations techniques for deep space, provide a steady rhythm of accomplishments, and fit within international budgets, priorities and schedules. Boeing's recent studies show that habitation for robust lunar surface exploration while supporting Mars objectives is both feasible and affordable. This paper discusses exploration habitat (both surface and in-space) development and considerations for requirements to allow designs to feed forward.