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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. The concepts defined now will be the basis of future exploration on the lunar surface and to Mars. Architectures for lunar space exploration must provide flexibility and resiliency to meet the objectives of multiple partners and demonstrate technologies for future missions. 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 Gateway to the surface of Mars, that leverages technology development at each step and maximizes cost effectiveness.

Boeing continues to study exploration architectures that both create a firm foundation for a sustained exploration program and prepare for future mission objectives. As always, the architectures must mature promising technologies and operations techniques for deep space, provide a steady rhythm of accomplishments, produce an extensible architecture for exploration beyond lunar space, and fit within international budgets, priorities and schedules. Boeing's recent studies show that an incremental, extensible and enduring exploration architecture that enables early lunar surface access while supporting Mars extensibility is both feasible and affordable. This paper discusses extensibility scenarios for future habitat development and considerations for requirements to allow designs to feed forward.