

HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Utilization & Exploitation of Human Spaceflight Systems (3)

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OVERVIEW OF NASA'S NEXTSTEP HABITATION DEVELOPMENT ACTIVITY

Abstract

The incremental and phased approach of NASA's deep-space habitat development strategy includes the progression from Earth Reliant activities in low-Earth orbit (LEO) to advancing systems and operational capabilities in the Proving Ground of cislunar space and gradually transitioning toward Earth Independent missions beyond the Earth-moon system. The near-term need for initial short-duration habitation beyond LEO is being explored including how this capability fulfills NASA's Human Exploration Objectives while leading to a validated system to conduct longer missions in deep space. Various implementation approaches are being assessed including potential commercial design concepts that are currently being investigated under NASA's Next Space Technologies for Exploration Partnerships (NextSTEP) Habitation development activity.

The purpose of the NextSTEP Habitation development activity is to investigate leveraging U.S. industry capabilities that could enable NASA habitation needs from LEO commercialization activities all the way through development and testing of a Mars-class habitation system. In Phase 2 of this effort, NASA sought development of habitation system concepts and technologies from six U.S. companies with the goal of developing full-size cislunar habitat ground prototypes by 2018. These ground prototypes will allow NASA and the NextSTEP habitation partners to: 1) evaluate configurations and habitability attributes of the habitat, 2) assess how the various systems interact together and with other capabilities like propulsion modules and airlocks, and 3) provide platforms to test and ensure that the standards and common interfaces being considered are comprehensive and enable the intended interoperability.

This paper will provide an overview of the NextSTEP Habitation Phase 2 efforts including status of the industry partner concepts; a summary of the integrated architecture analysis; strategies for leveraging government-furnished equipment, systems, and expertise; ground test objectives and plans for 2018; and progress toward developing deep space habitation standards and common interfaces. Plans for NextSTEP Phase 3 and beyond will also be discussed as well as potential acquisition approaches and timelines for the initial launch and aggregation of the cislunar habitat.