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HDU Deep Space Habitat (DSH) Overview

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ABSTRACT

This paper gives an overview of the National Aeronautics and Space Administration (NASA) led multi-center Habitat Demonstration Unit (HDU) project Deep Space Habitat (DSH) analog that will be field-tested during the 2011 Desert Research and Technologies Studies (D-RATS) field tests. The HDU project is a "technology pull" project that integrates technologies and innovations from multiple NASA centers. This project will repurpose the HDU Pressurized Excursion Module (PEM) that was field tested in the 2010 D-RATS, adding habitation functionality to the prototype unit.

The 2010 configuration of the HDU-PEM consisted of a lunar surface laboratory module that was used to bring over 20 habitation-related technologies together in a single platform that could be tested as an advanced habitation analog in the context of mission architectures and surface operations. The 2011 HDU-DSH configuration will build upon the PEM work, and emphasize validity of crew operations (habitation and living, etc), EVA operations, mission operations, logistics operations, and science operations that might be required in a deep space context for Near Earth Object (NEO) exploration mission architectures. The HDU project consists of a multi-center team brought together in a skunkworks approach to quickly build and validate hardware in analog environments.

The HDU project is part of the strategic plan from the Exploration Systems Mission Directorate (ESMD) Directorate Integration Office (DIO) and the Exploration Mission Systems Office (EMSO) to test destination elements in analog environments. The 2011 analog field test will include Multi Mission Space Exploration Vehicles (MMSEV) and the DSH among other demonstration elements to be brought together in a mission architecture context. This paper will describe overall objectives, various habitat configurations, strategic plan, and technology integration as it pertains to the 2011 field tests.

Key words: Deep Space Habitat, analog, operations, advanced habitation

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