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Return to the Moon (02)
Concepts for Robotic and Human Missions to the Moon (3)

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NASA HUMAN SPACEFLIGHT ARCHITECTURE TEAM LUNAR DESTINATION: 2011-CYCLE C LUNAR DESIGN REFERENCE MISSION

Abstract

NASA's Human Spaceflight Architecture Team (HAT) Lunar Destination Team has been developing a number of "Design Reference Missions" (DRM) to inform exploration architecture development, transportation approaches, and destination elements and operations. There are four destinations being considered in the HAT studies: Cis-Lunar, Lunar, Near Earth Asteroids and Mars. The lunar destination includes all activities that occur on the moon itself, but not low lunar orbit operations which are the responsibility of the HAT Cis-Lunar Team.

The HAT has several design cycles each year and this paper is based on HAT 2011- Cycle C results. A trade tree method of examining and down selecting viable DRM's will be discussed. It will review the various surface DRMs developed as representative scenarios that could occur in a human lunar return. The approaches have been divided into two broad categories: a seven day short stay mission with global capabilities, and a longer Extended Duration Stay of 28 days which is limited to the lunar poles as a landing zone. The surface elements, trade studies, traverses, concept of operations and other relevant issues and methodologies will be presented and discussed in the context and framework of the HAT ground rules and assumptions which are constrained by NASA transportation systems that are anticipated to be available. An international collaborative effort based on the 2011 Global Exploration Roadmap (GER) will also be examined and evaluated.