

Executive Summary

Date Prepared: August 16, 2007

Presenter's Name: Bret Drake, on behalf of the Mars Architecture Working Group
Presenter's Title: Chief Architect, Systems Engineering & Integration, Constellation Program
Presenter's Organization/Company: JSC, NASA

Presentation Title

The Things We Most Need to Learn at the Moon to Support the Subsequent Human Exploration of Mars

Key Ideas

The engineering and scientific heritage that will be established in the lunar exploration program over approximately the next two decades will be a critical component of the foundation for the subsequent human exploration of Mars. In order to optimize the value of that heritage, a very large multi-disciplinary, cross-organizational team of engineers and scientists, referred to as the Mars Architecture Working Group (MAWG), has been working on establishing a reference approach for the first three crewed missions to Mars. A primary purpose of this effort is to develop a specific understanding of the attributes of the lunar program that would be most beneficial to the safe and cost-effective conduct of human missions to Mars. MAWG has developed preliminary conclusions related to the transportation approach, the surface system, the design of the scientific system and surface science operations, human safety factors, and planetary protection.

Supporting Information

The Mars Architecture Working Group was chartered under the auspices of the Exploration Systems Mission Directorate, Science Mission Directorate, Aeronautics Research Mission Directorate, and the Space Operations Mission Directorate. During 2007, the Mars Architecture Working Group began the process of establishing better definition of potential strategies for the eventual human exploration of Mars. The MAWG was specifically chartered to:

- Update NASA's human Mars mission reference architecture,
- Establish a better understanding of key challenges including risk and cost drivers,
- Identify ways to reduce the cost and risk of human Mars missions through investment in research, technology development and synergy with other exploration plans,
- Assess the strategic linkages between lunar and Mars strategies, and
- Develop a forward plan to resolve issues not resolved during 2007

This presentation will provide an overview of the key findings resulting from the MAWG 2007 study, specifically as they pertain to the lunar exploration strategy.