HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)
Human Space Endeavour - Overview (1)

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FROM LEO, TO THE MOON AND THEN MARS: DEVELOPING A GLOBAL STRATEGY FOR EXPLORATION RISK REDUCTION

Abstract

Most nations currently involved in human spaceflight, or with such ambitions, believe that space exploration will capture the imagination of our youth resulting in future engineers and scientists, advance technologies which will improve life on earth, increase the knowledge of our solar system, and strengthen bonds and relationships across the globe. The Global Exploration Strategy, published in 2007 by 14 space agencies, eloquently makes this case and presents a vision for space exploration. It argues that in order for space exploration to be sustainable, nations must work together to address the challenges and share the burden of costs. This paper will examine Mars mission scenarios developed by NASA, ESA and other agencies and show resulting conclusions regarding key challenges, needed technologies and associated mission risks. It will discuss the importance of using the International Space Station as a platform for exploration risk reduction and how the global exploration community will develop lunar exploration elements and architectures that enable the long term goal of human missions to Mars.

The International Space Station (ISS) is a critical first step both from a technology and capability demonstration point of view, but also from a partnership point of view. There is much work that can be done in low earth orbit for exploration risk reduction. As the current "outpost at the edge of the frontier", the ISS is a place where we can demonstrate certain technologies and capabilities that will substantially reduce the risk of deploying an outpost on the lunar surface and Mars mission scenarios. The ISS partnership is strong and has fulfilled mission needs. Likewise, the partnerships we build on the moon will provide a strong foundation for establishing partnerships for the human Mars missions. On the moon, we build a permanently manned outpost and deploy technologies and capabilities to allow humans to stay for long periods of time. The moon is interesting from a scientific point of view, but it is extremely important for development and demonstration the technologies and capabilities needed for human missions to Mars. This paper will show the logic and strategy for addressing technological, operational and programmatic challenges by using low earth orbit and lunar missions to enable the long term goal of exploration of our solar system.