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CONCEPTS FOR JOINT INTERNATIONAL EXPLORATION MODULES

Abstract

Space agencies and companies around the world are examining concepts for human exploration of lunar space and beyond. International collaboration, as demonstrated so well by the ISS program, will be important to the success of these future exploration missions through cost sharing and leveraging the strengths of various partners. RSC Energia and Boeing believe that it is technically feasible to design and build a joint habitat using existing and developing technologies and processes. In this paper, we will describe our current concept for a joint early exploration mission architecture which emphasizes international elements and systems extensibility for future missions.

Starting with an early habitation module that extends mission durations in lunar space, additional elements and systems are added over time to increase vehicle functionality. This station could provide opportunities for deep space systems maturation, including those for deep space habitation and crew support crucial for Mars missions, science and human performance evaluation. A cislunar platform provides better conditions for many kinds of scientific experiments, for example, microgravity research, during uncrewed periods, due to the absence of crew and Earth-related disturbance torques. This concept provides the flexibility to accomplish near term objectives, such as lunar surface interactions and asteroid exploitation while steadily developing deep space capability. The concept provides the possibility of small modules built by each company and a larger module that is jointly built. We will describe a set of vehicle concepts within a proposed mission sequence, discuss required capabilities and key features and examine the importance of common standards in cooperative human space exploration.