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THE OPENING OF THE CIS-LUNAR COMMERCIAL FRONTIER: A CRITICAL PATH DEVELOPMENT MODEL

Abstract

Recent advancements in both space related technology and space policy are setting the conditions for the eventual operation of commercial companies in cis-lunar space. However, these proposed activities are testing the limits of both the regulatory environment which allows for commercial activities to occur and commercial funding mechanisms. How can government and industry best accelerate the development of commercial cis-lunar space for the benefit of both? This paper will describe a critical path required to open the cis-lunar frontier to a multitude of potential commercial enterprises that will serve the needs of commercial and government customers alike.

The critical path examined in this paper stipulates three necessary pre-conditions that must exist before a broad commercial presence in cis-lunar space will be feasible. These three pre-conditions are: the establishment of a regulatory environment which promotes commercial cis-lunar operations by encouraging private investment, a reduction in space launch/access costs, and the reduction of in-space operations costs.

First, by providing a regulatory environment supportive of commercial cis-lunar operations, governments provide the critical starting ingredient that only they can: the legal authority to engage in the specified activity. This, in turn, allows for the operation of commercial funding mechanisms by reducing the investment risk inherent in any environment lacking a clear regulatory regime.

Secondly, the cost of space launch/access must be reduced. As one of the single largest cost drivers for any space endeavor, launch costs must be reduced to allow needed capital to be spent on research, development, and deployment of a cis-lunar space architecture. Without a significant reduction in launch costs, the business cases for commercial space operations will remain incredibly difficult to make.

Finally, any long stay crewed cis-lunar activity will face another challenge: that of continuous space operations. Sourcing periodic resupply of expendables, such as oxygen, water, and fuel from Earth will likely bankrupt any commercial operation. Thus, step three involves the prerequisite development of a viable in-situ space resource utilization architecture that can supply the expendables required by the wide variety of commercial, and government, operators that will follow and ultimately require these services.

By first assessing the current state of the critical path via examination of each step in greater detail, the paper will describe how policy makers and industry can accelerate the development of commercial cis-lunar capabilities via the promotion of commercial investment through regulation and the development of critical foundational space capabilities.