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TOWARDS A MULTINATIONAL ARCHITECTURE FOR IN-SPACE SUSTAINMENT IN CISLUNAR SPACE

Abstract

In the coming decades, space exploration is poised to encompass and develop cislunar space. Reinvigorated initiatives to return to the Moon, to undertake commercial resource utilization, and planned cislunar injection trajectories are all underway. In-space sustainment infrastructure is a prerequisite for the development of exploration and development in cislunar space, and yet few coherent international architectures have been proposed. There is no shortage of development scenarios - NASA's Lunar Gateway, ESA's Moon Village, Space Resources Luxembourg, ULA Cislunar-1000.10, Cislunar Space Next and ISECG's Global Exploration Roadmap – but there is still insufficient agreement on steps and funding mechanisms leading to a comprehensive international architecture for in-space sustainment infrastructure. This paper aims to move beyond development scenarios to propose a reliable network of in-space logistics infrastructure, with a balanced trio of ends, ways and means. It recommends a multinational architecture designed to encourage the adoption of wider cost- sharing opportunities in adherence to international space law. The paper adopts an infrastructure-as-a-service model, in which industry-owned and operated in-space sustainment assets can be steered by government anchor tenants.