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Strategies & Architectures as the Framework for Future Building Blocks in Space Exploration and Development (1)

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THE GATEWAY AS A BUILDING BLOCK FOR SPACE EXPLORATION AND DEVELOPMENT

Abstract

The Gateway, which will be a small, human-tended space station in orbit around the Moon, is an example of the building block approach to space exploration and development. The National Aeronautics and Space Administration (NASA) leads the Gateway Program and serves as the integrator of the space-flight capabilities and contributions of U.S. commercial partners and international partners. Gateway is a cornerstone of deep space human exploration, one critical element of the strategies and architectures that will enable human exploration of the solar system.

This paper will outline: 1) The concept of operations and describe how Gateway is a multi-purpose space station, supporting lunar surface missions, cis-lunar research, and as a proving ground for human missions to Mars; 2) Gateway's international partnerships as an expansion of the partnerships of the "second generation of space programmes," namely the International Space Station (ISS); and 3) Future commercial, scientific, and technology demonstration opportunities that this infrastructure building block provides.

Lastly, the strategies and architectures for future space exploration and development must include thoughtful approaches to the management and business operations of government space programs. This includes planning for limited outyear growth in budgets, partnership and acquisition strategies, pursuing public-private partnerships and the use of firm-fixed price contracts, enabling vendor-to-vendor relationships, the use of multilateral interoperability standards, and incorporating key lessons learned from prior governmental Programs. This paper will discuss the strategies and approaches undertaken when establishing the Gateway Program at the NASA Johnson Space Center in 2019 and the current operational status of this new, lean, and efficient Program.