IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Governmental Human Spaceflight Programmes (Overview) (1)

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GATEWAY PROGRAM DEVELOPMENT PROGRESS

Abstract

This paper provides an overview and status of Gateway, humanity's first space station to orbit the Moon. Developed in collaboration with international and commercial partners, Gateway is an integral component of the NASA Artemis missions and Moon to Mars Architecture, providing vital support for a sustained, long-term human return to the lunar surface, while serving as a staging point for deep space exploration and a steppingstone to Mars.

As an orbiting lunar outpost, Gateway is a destination for deep space crew expeditions and science investigations, a port for deep space transportation, including landers transiting to the lunar surface or spacecraft embarking to deep space destinations beyond the Earth-Moon system. NASA leads the Program and is the integrator of the spaceflight capabilities and contributions of U.S. commercial and international partners developing Gateway.

This paper will offer an overview of Gateway's major components in various stages of development. The paper will also provide updates on the status of the integration activities and the novel challenges this unique Program and its team are overcoming to fly and operate a complex, next-generation integrated spacecraft for a minimum 15-year design life. Developmental components and processes to be addressed will include systems engineering integrated analysis cycles, the autonomous Vehicle System Manager software, verification and validation labs, and common vehicle equipment.

In this paper, details will be shared on the continued development of major hardware fabrication milestones achieved through continued cooperation with prime industry partners and multiple international space agencies: Northrop Grumman, Maxar Technologies, Canadian Space Agency (CSA), European Space Agency (ESA), and Japanese Aerospace Exploration Agency (JAXA). The paper will also highlight the Program's January 2024 announcement of its newest international partnership with the Mohammed Bin Rashid Space Centre and their agreement to provide the Crew and Science Airlock module for the Gateway Space Station.

Gateway is an evolution of extraordinary partnerships leveraging the capabilities of each contributor to expand humankind's sustained exploration deeper into the cosmos.

Keywords: Gateway; Artemis; Moon; Mars; science; deep space exploration; international partnerships; commercial partnerships; lunar surface; space station