Paper ID: 84208
oral

22nd IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND DEVELOPMENT (D3)
Space Technology and System Management Practices and Tools (3)

Author: Mrs. Emma Lehnhardt
NASA, United States, emma.lehnhardt@nasa.gov

NASA POLICIES AND MANAGEMENT PRACTICES FOR THE NEXT GENERATION OF HUMAN SPACE EXPLORATION: LESSONS FROM GATEWAY

Abstract

This paper provides an overview of how NASA's Gateway Program, one of the constituent programs of the Artemis Campaign, adapted the Agency's programmatic policies over the course of five years from Program establishment to present day. Applicable NASA procedural requirements, system engineering processes, handbooks, and business products will be outlined to provide context for the NASA management structure of spaceflight programs. This paper will outline best practices and tools for space system management utilized by the Gateway Program in the management of a multi-NASA center, multi-contract, multilateral space station development program. This paper will specifically delineate the methodology, tools, and lessons learned from adapting traditional joint cost and schedule confidence analysis.

The creation of the Gateway Program in 2019 was the result of several years of pre-formulation activities, and an Acquisition Strategy Meeting in mid-2018 that determined the core elements of the station with a make, buy, or partner determination for each. Gateway's leadership team undertook various innovative and entrepreneurial program management methods, some of which have led to best practices for NASA programs and formal, long-term changes to NASA's spaceflight program requirements. Gateway then progressed through two agency-level Key Decision Points, critical gates to determine if a Program should progress to the next phase of its lifecycle, including a Key Decision Point in 2023 representing formal approval to proceed from the Program's formulation phase to the implementation.

This Key Decision Point also established the Agency Baseline Commitment for Gateway's integrated set of requirements, cost, schedule, and technical content. Establishing an Agency Baseline Commitment requires a joint cost and schedule confidence level analysis, and an integrated risk and uncertainty analysis of cost and schedule for a given spaceflight program. This is one of NASA's key space system management tools based on a multiple probability simulation, or Monte Carlo modeling, of integrated cost, schedule, and risk data. Gateway's joint analysis was the first of its kind at NASA, incorporating multiple projects and firm fixed price contracts.