

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

Author: Mr. R. Marshall Smith
National Aeronautics and Space Administration (NASA), United States

NASA'S EXPLORATION MISSION STRATEGY

Abstract

Beginning in 2020, NASA will launch the first of two test flights of the SLS and Orion system. Exploration Mission - 1 (EM-1) will launch an uncrewed Orion capsule on an SLS Block 1 configuration to a distant retrograde orbit around the moon to complete a rigorous test matrix that will prepare the system for crewed flight on EM-2. The EM-2 mission will be the first crewed flight and will launch the Orion capsule on top of an SLS Block 1B version of the vehicle. On this second test flight of NASA's integrated deep space vehicle, NASA also plans to deliver the Power and Propulsion Element (PPE), the first component of the Lunar Orbital Platform-Gateway to cislunar space. Following those initial exploration missions, NASA will use the SLS and Orion to support the subsequent buildup and utilization of the Gateway over the course of Exploration Missions 3 through 5. This paper will articulate NASA's latest plans to develop and launch Exploration Missions beyond the initial test flights and also describe various scenarios for Gateway build up over several successive missions, using the co-manifested capability SLS Block 1B provides. This includes a description of capabilities provided by the various SLS configurations as well as a summary of the SLS Block 1B version with a new Exploration Upper Stage, which has the capability to launch more than 41 metric tons (mt) to cislunar destinations in the cargo configuration, or 10 mt of co-manifested payloads with Orion. A description of potential EM-3 through 5 manifest scenarios which will launch habitation elements, an airlock to enable EVAs, and a logistics module to complete the Gateway buildup will be summarized. The fully configured Gateway will serve as an initial staging point for deep space activities, and a summary of its initial functionality will be reviewed. A summary of impacts related to the President's Budget Request for FY2019 will be presented including potential revised launch scenarios associated with Gateway buildup.