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NASA Space Launch System Operations Outlook

William Keith Hefner, Brian P. Matisak, and Mark McElyea
Space Launch System Program, NASA Marshall Space Flight Center, AL, U.S.A.
and

Jennifer Kunz, Philip Weber, Nicholas Cummings, and Jeremy Parsons
*Ground Systems Development and Operations Program, NASA Kennedy Space Center, FL,
U.S.A.*

Abstract

The National Aeronautics and Space Administration's (NASA) Space Launch System (SLS) Program, managed at the Marshall Space Flight Center (MSFC), is working with the Ground Systems Development and Operations (GSDO) Program, based at the Kennedy Space Center (KSC), to deliver a new safe, affordable, and sustainable capability for human and scientific exploration beyond Earth's orbit (BEO). Larger than the Saturn V Moon rocket, SLS will provide 10 percent more thrust at liftoff in its initial 70 metric ton (t) configuration and 20 percent more in its evolved 130-t configuration. The primary mission of the SLS rocket will be to launch astronauts to deep space destinations in the Orion Multi-Purpose Crew Vehicle (MPCV), also in development and managed by the Johnson Space Center. Several high-priority science missions also may benefit from the increased payload volume and reduced trip times offered by this powerful, versatile rocket. Reducing the life-cycle costs for NASA's space transportation flagship will maximize the exploration and scientific discovery returned from the taxpayer's investment. To that end, decisions made during development of SLS and associated systems will impact the nation's space exploration capabilities for decades. This paper will provide an update to the operations strategy presented at SpaceOps 2012. It will focus on: 1) Preparations to streamline the processing flow and infrastructure needed to produce and launch the world's largest rocket (i.e., through incorporation and modification of proven, heritage systems into the vehicle and ground systems); 2) Implementation of a lean approach to reach-back support of hardware manufacturing, green-run testing, and launch site processing and activities; and 3) Partnering between the vehicle design and operations communities on state-of-the-art predictive operations analysis techniques. An example of innovation is testing the integrated vehicle at the processing facility in parallel, rather than sequentially, saving both time and money. These themes are accomplished under the context of a new cross-program integration model that emphasizes peer-to-peer accountability and collaboration towards a common, shared goal. Utilizing the lessons learned through 50 years of human space flight experience, SLS is assigning the right number of people from appropriate backgrounds, providing them the right tools, and exercising the right processes for the job. The result will be a powerful, versatile, and capable heavy-lift, human-rated asset for the future human and scientific exploration of space.