SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS (D2)
New missions enabled by Extra-large launchers (8)

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CURRENT STATUS OF NASA'S HEAVY LIFT PLAN: HEAVY LIFT CONCEPT DEVELOPMENT AND POTENTIAL UTILIZATION

Abstract

Numerous studies since the Apollo Program of the 1960s have highlighted the benefits of – and the need for - a national heavy lift launch capability to support human exploration, science, national security, and commercial development of space. NASA's most recent and most refined effort to develop that heavy lift capability is the Ares V. Ares V is a key element of NASA's Constellation Program. Although NASA's priority from the start of the Constellation Program to the present has been development of the Ares I and Orion crew vehicle to replace the retiring Shuttle fleet, the Ares team has made significant progress in understanding the performance, design trades, technology needs, mission scenarios, ground and flight operations, cost, and other factors associated with heavy lift development. The current reference configuration was selected during the Lunar Capabilities Concept Review (LCCR) in fall 2008. That design has served since then as a point of departure for further refinements and trades among five participating NASA field centers. Ares V development to date has benefited from progress on the Ares I due to commonality between the vehicles. The Ares I first stage completed a successful firing of a 5-segment solid rocket motor. The Ares I-X launch successfully demonstrated in suborbital flight the ability to assemble, prepare, launch, control and recover the Ares I configuration and compare performance to computer models. Component tests continue on the J-2X engine, which will put both the Ares I and Ares V upper stages into orbit. In addition, more than 100,000 parts have been manufactured or are in-process for the first J-2X powerpack and the first two development engines, with hot fire tests to begin in 2011. This paper will further detail the progress to date on the Ares V and planned activities for the remainder of 2010. In addition, the Ares V team has continued its outreach to potential user communities in science and national security. Through the Constellation Program, NASA has amassed an enormous knowledge base in the design, technologies, and operations of heavy lift launch vehicles that will be a national asset for any future launch vehicle decision. This early phase of the design presents the best opportunity to incorporate where possible the insights and needs of other users.