

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Upper Stages, Space Transfer, Entry and Landing Systems (3)

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ALTAIR LUNAR LANDER DEVELOPMENT STATUS: ENABLING HUMAN LUNAR EXPLORATION

Abstract

As a critical part of the NASA Constellation Program lunar transportation architecture, the Altair lunar lander will return humans to the moon and enable a sustained program of lunar exploration. The Altair is to deliver up to four crew to the surface of the moon and return them to low lunar orbit at the completion of their mission. Altair will also be used to deliver large cargo elements to the lunar surface, enabling the buildup of an outpost. The Altair Project initialized its design using a “minimum functionality” approach that identified critical functionality required to meet a minimum set of Altair requirements. The Altair team then performed several analysis cycles using risk-informed design to selectively add back components and functionality to increase the vehicles’ safety and reliability. The analysis cycle results were captured in a reference Altair design. This design was reviewed at the Constellation Lunar Capabilities Concept Review, a Mission Concept Review, where key driving requirements were confirmed and the Altair Project was given authorization to begin Phase A project formulation. A key objective of Phase A is to revisit the Altair vehicle configuration, to better optimize it to complete its broad range of crew and cargo delivery missions. Industry was invited to partner with NASA early in the design to provide their insights regarding Altair configuration and key engineering challenges. A blended NASA-industry team will continue to refine the lander configuration and mature the vehicle design over the next few years. This paper will update the international community on the status of the Altair Project as it addresses the challenges of project formulation, including optimizing a vehicle configuration based on the work of the NASA Altair Project team, industry inputs and the plans going forward in designing the Altair lunar lander.