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Return to the Moon (02)
Concepts for Robotic and Human Missions to the Moon (3)

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AN ALTAIR OVERVIEW - DESIGNING A LUNAR LANDER FOR 21ST CENTURY HUMAN SPACE EXPLORATION OF THE MOON

Abstract

Altair, NASA's lunar lander project during NASA's Constellation program, functioned differently than many other NASA projects of similar scope. Because of this relatively unique approach, there are a number of significant success stories that should be considered during the development of any future lunar landers. This paper will have two separate themes; the first is the approach used during the conceptual design studies, and the second is a summary of the resulting technical characteristics of the lander and the driving rationale behind some of the decisions. Altair was often criticized for being a very heavy and very large vehicle, and while there was specific rationale for all of the decisions that led up to that configuration, if the project had continued many of those decisions would have been rechallenged as part of the process the Altair management team had planned. Some of the specific items that will be addressed include project development strategy, organizational approach and team dynamics, risk-informed design process, mission architecture constraints, mission key driving requirements, model-based systems engineering process, configuration studies, contingency considerations, subsystem overviews and key trade studies. The paper will conclude with a summary of the lessons identified during the Altair project and make suggestions for application on the next lunar lander in the 21st century.