

Altair Lander Life Support: Design Analysis Cycles 4 and 5

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Life support systems are a critical part of human exploration beyond low earth orbit. NASA's Altair Lunar Lander team is pursuing efficient solutions to the technical challenges of human spaceflight. Life support design efforts up through Design Analysis Cycle (DAC) 4 focused on finding lightweight and reliable solutions for the Sortie and Outpost missions within the Constellation Program. In DAC-4 and later follow on work, changes were made to add functionality for new requirements accepted by the Altair project, and to update the design as knowledge about certain issues or hardware matured. In DAC-5, the Altair project began to consider mission architectures outside the Constellation baseline. Selecting the optimal life support system design is very sensitive to mission duration. When the mission goals and architecture change several trade studies must be conducted to determine the appropriate design. Finally, several areas of work developed through the Altair project may be applicable to other vehicle concepts for microgravity missions. Maturing the Altair life support system related analysis, design, and requirements can provide important information for developers of a wide range of other human vehicles.

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