

15th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)Strategies & Architectures as the Framework for Future Building Blocks in Space Exploration and
Development (1)

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MOON VILLAGE THE NEW BEGINNING OF COLONIZATION

Abstract

The Moon has been known since prehistoric times. It is the second brightest object in the sky after the Sun and orbits around the Earth once per month. The moon is also our nearest celestial neighbor. Current interest in planetary and long duration space exploration requires further understanding and researches on self-sustaining societies. Moon is a possible platform for such studies. This article is a study of how moon is vital for the future human space exploration for all deep space human missions. The major focus is to keep humans alive, happy and healthy on the surface. Identifying, designing and predicting technology requirements for Environmental Control and Life Support System (ECLSS) for colonizing the moon is the first task need to be performed to keep them alive.

The article is feasibility report on the precursor mission of creating permanent base on the surface of the moon. The main assumption of this base is, 7 crew sets foot on the surface of the moon by 2026 for a period of two years. Every year additional 7 members along with resupply would be provided. Also emphasis on the mission goals and importance along with future technological requirements was discussed.

The ECLSS system designed for this base considered available technologies, undergoing researchers with Technical Readiness Level (TRL) of 4 and above, and possibility of using in-situ resource utilization (ISRU) at the surface of the moon. The following subsystems were considered for the ECLSS studies: atmospheric management, waste management, food, and water system.