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IMPORTANCE AND CHALLENGES OF INTEGRATING BLSS INTO ECLSS

Abstract

Bioregenerative Life Support Systems (BLSS) are a key facet of plans for long term habitats on other celestial bodies. With the Artemis program headed to the moon and SpaceX pushing towards Mars the roadmap is about 10-20 years. Therefore it is vital to consider how BLSS will work with the traditional mechanical Environmental Control and Life Support Systems (ECLSS). Biological systems are complicated. Their inputs and outputs cannot be turned on and off the way mechanical systems can. Therefore the accurate monitoring and prediction of these systems is fundamental to integrating the BLSS into the life support as a whole. This paper will summarize the history of BLSS research, the system requirements for integrating a BLSS into the ECLSS, and the research needed to meet these requirements. As the world looks towards the future of humans living on other celestial bodies, there is a lot of work to do to support keeping them safe and healthy. Bioregenerative Life Support Systems have potential to provide massive support, if they are effectively integrated with the mechanical systems.