Paper ID: 69825
oral
student

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Astronaut Training, Accommodation, and Operations in Space (5)

Author: Mr. Chrishma Singh-Derewa
United States

Ms. Farnoosh Sheini Dashtgol
United States
Prof. James Nabity
University of Colorado Boulder, United States
Dr. Galina Nicoll
University of Colorado Boulder, United States

A COMMON HUMAN FACTORS AND LIFE SUPPORT ARCHITECTURE FOR THE ARTEMIS CAMPAIGN

Abstract

NASA's Artemis Campaign has unified industrial and international partners in laying the foundation for human exploration and industrialization of the solar system. Industry is designing a unified crew interface and Environmental Control and Life Support System (ECLSS) architecture to achieve the goal of returning humans to the Moon to stay and pushing onwards to Mars. A flexible and extensible crew interface and ECLSS system architecture enables this vision for both near term and long term missions. The Commercial Low Earth Orbit (LEO) Destination (CLD), Habitation and Logistics Outpost (HALO) at the Moon and its successor at Mars, Lunar Surface Habitats (LSH), Mars Transfer Habitats (MTH) as well as human and cargo landing systems (HLS) for the Moon and Mars will leverage this unique crew centric design. The first phase of this design is already underway. The planned outpost in NRHO orbit capitalizes on this flexible interface and extensible ECLSS architecture. These unique orbital assets provide a platform for crewed and uncrewed science, teleoperations of surface assets and furthers humanities microgravity experience. This architecture leverages successful orbital designs with the versatility of crew interfaces and an ECLSS system built on common interfaces and heritage systems. The integrated industry and academic development of this architecture includes researchers from Texas AM and CU Boulder. The systems engineering team utilizes an advanced digital models to depict and represent crew interfaces and systems level diagrams. A digital representation of the integrated architecture will enable customers to design and interact with crew systems digitally during training saving time and resources while increasing technical proficiency. The system design, interfaces and digital framework detailed here will facilitate the customer experience while facilitating the crewed experience en route to the Moon, Mars and beyond.