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Author: Ms. Agata Mintus
Space is More, Poland

Mr. Leszek Orzechowski
Space is More, Poland
Ms. Paula Drozdowska
Wroclaw University of Science and Technology, Poland

ANALOG HABITATS AS RESEARCH PLATFORM - LUNARES RESEARCH STATION MISSION
CONTROL CONCLUSIONS AND GUIDELINES FOR STANDARDIZED MISSIONS ORGANIZATION.
INVESTIGATING INCREASE IN RESEARCH DATA AMOUNT AND QUALITY, AND IRRELEVANT
VARIABLES MITIGATI

Abstract

LunAres Research Station is a facility conducting and providing environment for analog research for human spaceflight sector. The operation strategy for last years (2020-2022) was aiming for developing the habitat towards research platform for human factor studies. This research field requires multiple data points and subjects which can result as statistical data. Due to the mission architecture simulation accuracy (e.g. crew size), operation possibilities and logistics – there is a big issue with gathering efficiently and relatively fast data for more than 30 subjects (which is assumed to be minimal samples amount, before you can reasonably expect an analysis based upon the normal distribution to be valid). The Mission Control Centre (MCC) planned 16 missions in years 2021-2022 – investigating increasing the amount of standardized (2-weeks, 6-persons crew) missions. The standardization of mission architecture, procedures and conditions was tested. The objective was to determine all the constants and factors of focus to be supported, and investigate the limitation of irrelevant variables. Those analysis were conducted by the LunAres MCC, supported by the data gathered from the mission, interviews with researchers and participants. The monitoring process and logging system of the constants or factors within the research scope was updated and tested for research purpose during each mission. The main variables to limit (included in the analysis) were: 1. the impact of the MCC operation (communication with the crew, mission coordination), 2. mission immersion of the participants/mission accuracy (coordinated by the MCC and impacted by the infrastructure and environmental conditions), 3. crew characteristics having impact on the mission scenario.

In this paper the authors will present the development process of the station towards the standardization of the missions at LunAres. The conclusions and observations in irrelevant variables mitigation would be described.