Paper ID: 41143

HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Interactive Presentations (IP)

Author: Ms. Efstratia Salteri
Space Generation Advisory Council (SGAC), Germany

Ms. Behnoosh Meskoob
Space Generation Advisory Council (SGAC), Iran
Mr. Samuel Hargrove
Space Generation Advisory Council (SGAC), United States
Ms. Poonampreet Kaur Josan
University of North Dakota, United States
Ms. Ilaria Cinelli
National University of Ireland Galway, Ireland
Mr. Guillaume Thirion
Space Generation Advisory Council (SGAC), France
Dr. Aline N. Dinkelaker
Humboldt-Universität zu Berlin, Germany
Ms. Sumana Mukherjee
University of Petroleum and Energy Studies, India
Ms. Carmen Felix
Space Generation Advisory Council (SGAC), Mexico

PLANNING AND SCHEDULING FOR THE POLAND MARS ANALOGUE SIMULATION- PMAS 2017

Abstract

In order to prepare a human exploration mission to the Moon or Mars, clear knowledge of the relationships between the parameters and constraints of all kinds of planetary EVA architectures is required. With this, more robust decisions can aid in the complex evaluation of EVA planning. The purposes of planning and scheduling for a Mars simulation are to prepare support teams and crew members, to achieve smooth mission development and to increase productivity and scientific return. Problems may arise even in the most well-planned missions – hardware malfunction or unforeseen logistical problems may arise, among other eventualities. However, efficient planning minimizes problems and can be the key to a mission's success. The Poland Mars Analogue Simulation (PMAS) will be conducted in two phases. The first three days of the mission will simulate a lunar scenario, and the rest of the mission's duration will be used for a Mars simulation with communication delay. The role of the PMAS Planning and Scheduling Team is to develop an operational schedule for the astronauts including scientific experiments, activity logistics, breaks and emergency procedures. Such planning requires the team to develop a deep understanding of the mission structure and experimental procedures. Specifically, the Planning and Scheduling Team will be responsible for allotting time for scientific experiments inside and outside the habitat, planning and scheduling EVAs, and maintaining an inventory of crew consumables including food, power and life support systems. Based on the length of the mission, the time delay, the complexity of the experiments and the crew personnel, the planning strategy used for PMAS will be the "1-Day-in Advance Planning Strategy." The team was given the opportunity to apply this strategy during the M.A.R.S. Lunar Campaign in Poland and the mission of the Mars Desert Research Station (MDRS) Crew 172, in August 2016 and January 2017 respectively. This paper aims to analyse the results of the strategy's use in these two

case studies and discuss how these results should help in optimizing the efficiency of PMAS and future missions. More specifically, the scheduling strategy will be evaluated in terms of sleep time, time spent executing scientific EVAs, the number of successfully completed experiments and more.