14th HUMAN EXPLORATION OF THE MOON AND MARS SYMPOSIUM (A5)
Near Term Strategies for Lunar Surface Infrastructure (1)

Author: Dr. Guy Pignolet
Science Sainte Rose, La Reunion, guy.pignolet@science-sainte-rose.net

Mr. Romain Benchenafi
Ecole de l'Air, France, r.benchenafi@hotmail.fr
Mr. Lorenzo Dequelson
Collège Leconte de Lisle, France, lorenzo.dequelson@laposte.net
Prof. Bernard Foing
ILEWG, The Netherlands, Bernard.Foing@esa.int
Mr. Ivo Ferreira
Instituto Superior Técnico, Portugal, ivotomar@gmail.com

SAMPLE SELECTION WITH ROBOT UAV ASSISTANCE : THE SALM SAINTE-ROSE / MDRS CREW 100 A DISTANT SUPPORT EXPERIMENT

Abstract

During ILEWG EuroMoonMars MDRS Crew 100A Mission, that started on February 12 2011 at the MDRS (Mars Desert Research Station) an analogue Mars environment in the Utah desert (USA), SALM Sainte-Rose, another analogue site on the Piton de la Fournaise volcano in Reunion Island, was named as a Distant Mission Support for a sample selection experiment with the assistance of a Parrot quadricopter UAV (Unmanned Air Vehicle).

A first flight of the Parrot was made on sites P2 (N38.40746º W110.79280º) and P3 (N38.40737º W110.79261º) on Day09 and the movies were sent by Internet to SALM Sainte-Rose and University of La Reunion for the selection of the preferred areas for sampling. Pictures of selected locations on P3 site were sent back to MDRS by SALM Sainte-Rose. A second flight of the Parrot was made on Day10 to take close-up images of the selected spots and again sent to SALM Sainte-Rose where precise indication of samples was made from film images to study the differences between close-by shaded and exposed areas in two locations.

Pictures of selected samples were sent by Internet to MDRS and on Day11, an EVA was succesfully made to retrieve the samples for SALM, with duplicates for VU Amsterdam. Sample analyses were made at a later time at SALM Sainte-Rose, for a final report to MDRS EuroMoonMars Crew 100A.

Lessons learned from the MDRS simulation were that UAV reconnaissance of terrain can save time and energy of crews by helping to plan the best route for the final sample retrieval EVA, and sample selection may be efficiently made by a science team from a distant location.