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SAFETY CONSIDERATIONS FOR SPACE ANALOG STATIONS AND MARS HABITATS

**Abstract**

This research evaluated possible accidents that may occur in the assembly of a Mars analog station and that may have results applicable to space stations. This research is the result of the mission 27 carried out in the Brazilian Mars simulation station Habitat Marte, which took place on January 10, 2020. In the mission, was noted with the rain and winds, the increase of risks perception, generating stress and psychological suffering. During the mission and post-mission, was evaluated the developing of procedures to avoid stressful situations arising from the risks from rains. It is likely that from January to April 2020 there is a forecast of frequent rains in the region where Habitat Marte works. On Mars the threats will be different, for example: sand and dust storms. It is important to have safety protocols to deal with the procedure for constructing similar habitats and those that will work on Mars. In rainy circumstances some possible risks are: falling; electric shock; difficulty in handling tools; accidents; physical and epithelial injuries and mobility difficulties. In rainy situations, additional safety precautions are required. It is also necessary to define in which situations a structure assembly activity needs to be suspended. It is recommended that it would be interesting to look at some possible sources of information to predict possible risk conditions arising from rains: 1) clouds in the sky; 2) pluviometer; 3) rain forecasts on specialized sites. In a time of heavy rain, Extravehicular Activities could be suspended after an evaluation of the possible consequences of working in these conditions. At Mars Desert Research Station - MDRS, in Hanksville (Utah-United States), in conditions of climatic instability such as rain and snow, EVA are suspended. This is a procedure to be followed by several analog stations. Rainy situations demand reflection on infrastructure improvement procedures, such as: 1) application of non-slip tapes; 2) cleaning rainwater accumulated with squeegee; 3) creation of more areas covered with roofs; 4) creation of drainage structures, preventing the accumulation of water; 5) pavement of soil / clay areas by cement surfaces in order to avoid contamination problems and accidents arising from contact with mud. Also at the MDRS, in the 182 mission (November / 2017), many problems related to mud were observed. For Mars, possible threats to building habitats are: 1) dust storms, 2) strong winds, 3) cosmic storms; 4) landslides in unstable areas and 5) contamination of clothing.