Paper ID: 26646
oral

27th SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS (E3)
International Space Exploration Policies and Programmes (2)

Author: Dr. Margaret Race
SETI Institute, United States, mracemom@aol.com

Dr. Catharine Conley
National Aeronautics and Space Administration (NASA), United States, Cassie.Conley@nasa.gov

THE CHALLENGES OF IMPLEMENTING PLANETARY PROTECTION DURING FUTURE HUMAN MISSIONS: PROGRESS UPDATE ON AN IAA STUDY

Abstract

Planetary protection controls established by the Committee on Space Research (COSPAR) of the International Council for Science have been in force for five decades, ensuring responsible exploration and the integrity of exploration activities, for both human and robotic missions in the Solar System beyond Earth orbit. Currently, operations on the vast majority of objects in the solar system are not constrained by planetary protection considerations because they cannot to be contaminated by Earth life in ways that impact exploration. In contrast, Mars, Europa, and Enceladus, which represent locations with biological potential, are subject to strict planetary protection constraints for missions of all types.

While guidelines for planetary protection controls on human missions to Mars have been established by COSPAR, detailed engineering constraints and processes for implementation of these guidelines have not yet been developed. Already, a number of international studies have recognized that planetary protection controls for human missions can often be supportive of other important mission needs, such as maximizing closed-loop and recycling capabilities to minimize mass required, minimizing exposure of humans to planetary materials for multiple health reasons, and minimizing contamination of planetary samples and environments during exploration and science activities.

We report on the progress of a current IAA Study Group that is engaging human mission developers in exploring technical, engineering and operational approaches by which planetary protection objectives can be accomplished in synergism with other mission constraints when possible. By integrating planetary protection considerations early in mission design, it is possible to address human, environmental and science considerations through cross-cutting measures of various types. In addition to highlighting important information for the early stages of planning, this study has also identified key RTD areas for further consideration and work. Ultimately, agreement at international level regarding planetary protection research and implementation activities is necessary to ensure that all organizations avoid releasing harmful contamination on bodies with biological potential and ensure protecting the Earth and astronauts throughout missions—all in compliance with the 1967 Outer Space Treaty.