

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Interactive Presentations (IP)

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OPERATIONS CONCEPT FOR TC & TM APPLIED TO ROVERS ON THE MOON

Abstract

This abstract is written in the context of the SpaceTech Central Case Project 2016/2017, also known as CCP. The CCP studies in detail the possibility of running a viable space business by operating rovers on the Moon with entertainment and scientific payloads.

The presentation will focus on the operational aspects covering the TC and TM (Telecommands and Telemetry) for rovers on the Moon. The work will assess the suitability of the services defined in the ECSS PUS (European Cooperation for Space Standardization Packet Utilisation Standard). The PUS specifies a variety of areas related to monitoring and control: Telecommanding; Telemetry reporting; Software management; Onboard operations scheduling; Onboard monitoring; Onboard operations procedures; Attaching actions to onboard events; Onboard storage and retrieval; Telemetry generation and forwarding; Memory management; Diagnostics and testing.

For a given mission, usually only a subset of these services is appropriate. The work will assess the options for rovers on the Moon in order to decide which services to select and the parameters of the selected services.

Practical aspects regarding the implementation of the PUS will be also considered. The suitability of using SCOS-2000 will be assessed. The Spacecraft Control and Operation System (SCOS) is a software application developed by ESA (the European Space Agency) and used in a multitude of space missions such as Mars Express, Venus Express, Rosetta, Envisat or MSG (Meteosat Second Generation).

The presentation will assess the evolution of the ECSS PUS Services and the future CCSDS MO Services (Consultative Committee for Space Data Systems Mission Operations) and how this may affect the monitoring and control of rovers on the Moon. In this context, the evolution of SCOS-2000 to the more generic EGS-CC (European Ground Systems Common Core) will be also analysed.