

SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – Science, Instruments and Technologies (3B)

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EXOMARS 2018 MISSION PLANETARY PROTECTION IMPLEMENTATION

Abstract

The ExoMars Programme is based on a broad cooperation between ESA and Roscosmos with some contributions from NASA consisting of two missions planned for launch in 2016 and 2018. The ExoMars 2018 mission is scheduled for launch in 2018 by a Roscosmos supplied Proton-M/Breeze-M rocket. The system consists of an European Carrier Module (CM), an European Rover Module (RM) with Pasteur Payload (PPL) and a Descent Module (DM) under Russian responsibility. The project has been categorized as COSPAR Planetary Protection Category IVb. Thales Alenia Space Italia is the Prime Contractor for the development of the European mission elements as well as for the Spacecraft Composite requirements and design. TAS-I cooperates with Lavochkin Association, Prime of the Russian industries, for the development of the Russian Descent Module. The ExoMars 2018 mission scientific objectives pursued by the Rover and PPL suite are to search for signs of past and present life on Mars and to investigate the water/geochemical environments as a function of depth in the shallow subsurface. The implementation of the planetary protection requirements is an evolution of the approach applied to ExoMars 2016 Mission. Lessons learned from ExoMars 2016 Mission through the EDM assembly, integration and test are applied to the RM and the European elements of DM. The approach for compliance of CM to Planetary Protection requirements depends strongly on the result of the break-up/burn-up analysis already performed for S-PDR and in process of refinement for S-CDR. The Spacecraft Composite also needs to comply with Probability of impact requirements defined by COSPAR, up to DM descent and CM demise through Mars atmosphere. As main improvement and departure from the ExoMars 2016 experience, the Aseptic Assembly facility concept is applied to the integration of the Ultra-Clean Zone of the Analytical Laboratory Drawer, the core of the scientific mission of the Rover. The presentation gives the updated status on the Planetary Protection activities implementation in the frame of ExoMars 2018.