IAF SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – missions current and future (3A)

Author: Dr. Bruno Musetti
Thales Alenia Space Italia, Italy, bruno.musetti@thalesaleniaspace.com

Mr. Andrea Allasio
Thales Alenia Space Italia, Italy, andrea.allasio@thalesaleniaspace.com
Mr. Maurizio Capuano
Thales Alenia Space Italia, Italy, maurizio.capuano@thalesaleniaspace.com
Mr. bruno vinai
Thales Alenia Space Italia, Italy, bruno.vinai@thalesaleniaspace.com
Dr. Pietro Baglioni
European Space Agency (ESA), The Netherlands, pietro.baglioni@esa.int
Mr. Thierry Blancquaert
European Space Agency (ESA), The Netherlands, thierry.blancquaert@esa.int
Mr. Albert Haldemann
ESA, The Netherlands, albert.haldemann@esa.int
Dr. Sergei Antonovich Lemeshevsky
Lavochkin Association, Russian Federation, cms87@yandex.ru
Prof. Oleg Sergeevich Grafodatsky
Lavochkin Association, Russian Federation, grafodatsky@laspace.ru
Mr. oleg sedykh
Lavochkin Association, Russian Federation, cms@laspace.ru
Mr. Francois Spoto
ESA - European Space Agency, The Netherlands, francois.spoto@esa.int
Mr. Alexey Ivanov
Lavochkin Association, Russian Federation, cms@laspace.ru

EXOMARS ROVER AND SURFACE PLATFORM MISSION: PREPARING THE SYSTEM INTEGRATION AND VERIFICATION PHASE

Abstract

The ExoMars program is the first step of the European Space Agency's Aurora Exploration Programme and is developed in a broad ESA and Roscosmos co-operation, with a contribution from NASA in the area of Entry Descent and Landing and Mars proximity Communications. It addresses the scientific question of whether life ever existed on Mars and will demonstrate key technologies for entry, descent, landing, drilling and roving on the Martian surface. Thales Alenia Space is the ESA prime contractor of the ExoMars program and is leading a large industrial team. The Trace Gas Orbiter (TGO) has completed its Aerobraking phase and started its science operations; meanwhile the second mission, called Rover & Surface Platform, has undergone the CDR and is entering the assembly and testing phase. The RSP Spacecraft Composite is composed of a Carrier Module (CM) and a Descent Module (DM), whose Landing Platform (LP) will house a Rover and nine scientific payloads. It will be launched in July 2020 with a Proton rocket from the Baikonur Cosmodrome. After a cruise of about 8 months, in March 2021 the Descent Module will be separated from the Carrier, enter into the planet's atmosphere and subse-

quently deliver the Landing Platform and the Rover on the Mars surface. After Rover egress, the Surface Platform will initiate its scientific mission which consists in a complete environmental characterization of the landing site, while the Rover will explore the surface, for an expected duration of 218 Martian days (approx. 230 Earth days). During the exploration, the Rover will mainly use the TGO-2016 for the communications with Earth. This paper describes the ExoMars RSP mission with a particular focus on functional verification and mechanical qualification of the modules which will start in the current year 2018. Functional verifications will be carried on the Avionics Test Bench in Torino; in parallel the Russian partners will be performing the vibro-dynamic and thermal test campaigns on the structural and thermal models of the Spacecraft Composite and Descent Module. Those activities are the first steps of the following AIT campaign on the Proto-flight Models due to start at the end of the current year, with final spacecraft level environmental testing in 2019.