

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

Author: Mr. Stefano Voglino

Thales Alenia Space Italia, Italy, stefano.voglino@thalesalieniaspace.com

Mr. Bruno Vinai

Thales Alenia Space Italia, Italy, bruno.vinai@thalesalieniaspace.com

Mr. Franco Ravera

Thales Alenia Space Italia, Italy, franco.ravera@thalesalieniaspace.com

Mr. Maurizio Capuano

Thales Alenia Space Italia, Italy, maurizio.capuano@thalesalieniaspace.com

Dr. Maria Antonietta Perino

Thales Alenia Space Italia, Italy, mariaantonietta.perino@thalesalieniaspace.com

Dr. Pietro Baglioni

European Space Agency (ESA), The Netherlands, pietro.baglioni@esa.int

Mr. Mattia Mercolino

European Space Agency (ESA), Germany, mattia.mercolino@esa.int

Dr. Eric Zekri

ESA - European Space Agency, The Netherlands, eric.zekri@esa.int

Mr. Benjamin Rasse

ESA - European Space Agency, The Netherlands, Benjamin.Rasse@esa.int

ROSALIND FRANKLIN MISSION: A NEW MISSION FOR EXOMARS.

Abstract

Due to the geopolitical crisis following events in Ukraine, by decision of the ESA Members States (July 2022) the cooperation with Roscosmos on the ExoMars mission was stopped and consequently the planned launch in September 2022 from Baikonour Cosmodrome with a Proton launcher cancelled, albeit the Spacecraft had passed successfully its Flight Acceptance and Qualification Review and was ready to prepare for transportation to the launch site.

Following this decision, a study phase was kicked off and performed in the second half of 2023, to identify the most effective way to complete the program and perform anyway the mission considering all possible alternative launch scenarios opportunities. The study indicated as most feasible launch opportunities a long transfer (baseline) and a short transfer (backup) both in the second half of 2028. The initial dates were later refined by mission analysis to October 2028 (baseline, T3 transfer profile) and December 2028 (backup, T1 transfer profile).

In the new mission, two main elements of the Spacecraft Composite are available and will be re-used with limited modifications relevant to age sensitive elements. These are the Carrier Module supporting the Cruise phase of the Mission and the Rover Module responsible for the Mars Surface mission, having as main objective the search for traces of past and present life. The Descent Module and the Landing Platform require instead an almost complete re-development, with the exclusion of the already existing European contributions to the EXM-22 Descent Module consisting in a number of avionics units, the radar, the on board computer and the Parachute Assemblies, that will be also re-used in the new lander. The paper will synthetically describe the new mission architecture, the planned maintenance/refurbishment activities and the design and development approach for the new spacecraft composite.