

SPACE EXPLORATION SYMPOSIUM (A3)  
Mars Exploration – Part 1 (3A)

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EXOMARS 2016 MISSION: AN OVERVIEW OF THE PHASE C ACTIVITIES PROGRESS

**Abstract**

The ExoMars Programme foresees a major partnership between ESA and Roscosmos, with some cooperation by NASA, to explore Mars and prepare for the Mars Sample Return mission. The ExoMars Programme features two missions, one to be launched in January 2016 and one in April/May 2018. Hence for the 2016 mission ESA will procure a large Spacecraft Composite consisting of a Trace Gas Orbiter (TGO) and an EDL Demonstrator Module (EDM). The Spacecraft Composite will be launched in January 2016 (back-up launch in March) by a Proton Launcher, to arrive at Mars in mid-October of 2016. The 2016 mission industrial activities are now focused on phase C which will culminate in the System-CDR planned at the end of the current year 2013. The EDM development is on schedule; in particular the EDM SM has been subjected to leak-tests in TAS-I to prove the tightness of the aeroshell. Sine and static tests will follow to demonstrate capability to withstand the launch and entry mechanical loads. The functional qualification campaign has started with SW integration on the EDM ATB. Wind Tunnel Test campaign has been completed and the Aero-Thermodynamic Data Base is now consolidated. A High Altitude Drop Test, to verify the parachute performances in a high altitude environment, is planned in Romania using the ARCA facilities. At subsystem level the crushable structure (SENER) development tests have been completed and the structure is ready for the final qualification tests planned in the summer. The TGO Mechanical Thermal Propulsion (MTP) and Avionics Electronic and Radiofrequency (AER) PDR's have been completed in the course of the year 2012. The phase C analyses campaign has started with the GNC Robustness Analyses. The Central Software and Satellite Database (SDB) development has been worked out in staggers (from V1 to V4) and the delivery of the CSW V1 is scheduled in July 2013. The 2,2 meter High Gain Antenna has entered the detailed analyses phase and its CDR is planned in Sept 2013. The TGO Harness Manufacturing Review has been held in Jan 2013 and the first of four planned batches is scheduled by June 2013. At MTP level the final structural, thermal and thermo-elastic analyses will be completed by March 2013. Testing Activities on Central Tube Structural Model, Propulsion Engineering Verification Model and Thermal Engineering Verification Model are planned to be completed in Q2 and Q3 2013. The MTP will undergo its CDR in July 2013.