**EXOMARS – A PROMISING FUTURE**

**Video** Online only

**Title** ExoMars – A Promising Future

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**Description**

2016 has been an eventful and promising year for ESA’s ExoMars mission. After successfully placing the Trace Gas Orbiter into Mars’ orbit on 19 October, the orbiter has sent back its first images, tested its instruments and performed in orbit calibration measurements and health checks.

The Schiaparelli lander collected almost all of its expected data before its unexpected crash landing on the Martian surface. Crucial lessons will be learnt from this for the recently approved 2020 ExoMars mission, which will put Europe’s first rover on Mars.

The precise cause of the lander loss is still being investigated but preliminary technical investigations have found that the atmospheric entry and slowing down in the early phases went exactly as planned.

In all, since its launch in March 2016, the ExoMars mission has been a mixture of successes and one expected set back. Looking ahead, the Trace Gas Orbiter will start aerobraking in March 2017 to gradually slow down over the following months. By the end of 2017, the orbiter will be in a lower, near circular orbit of 400 kms and ExoMars’ primary science mission can begin.

**AROLL SCRIPT**

10:00:10

[Launch footage, ExoMars 14 March 2016; launch animation]

2016 has been an eventful year for ESA’s ExoMars mission. It has been one of multiple successes, and one unexpected set back.

10:00:23

[Animation ExoMars 2020 mission]

But it is ending on a positive commitment to the future of European science on Mars.

Ministers from ESA member states have agreed to continue funding the next stage of ExoMars – a second mission which will include a robotic rover – a first for Europe and the first rover that will search for signs of life below the planet’s surface to a depth of two metres.

10:00:48

[ExoMars mission control, ESOC, 19 October 2016]

The mission will build upon the findings of ExoMars 2016, which arrived at Mars in October after a seven-month journey.

10:00:57

[Animation ExoMars 2016, Trace Gas Orbiter]

The ExoMars Trace Gas Orbiter has now tested its instruments in orbit. The calibration measurements and health checks demonstrated that the orbiter is on course for a successful mission.

10:01:09

[Animation Mars]

The present orbits around Mars take just over four days and distances above the surface vary from 100,000 kilometres to just 230.

10:01:21

[Stills Trace Gas Orbiter instruments and NOMAD readings]

The Atmospheric Chemistry Suite, ACS, and the NOMAD instruments will be measuring gases in the atmosphere including methane, nitrogen dioxide, acetylene and water vapour – trace gases that make up less than 1% of the atmosphere.

10:01:38

[Animation methane from geological activity]

Methane is especially important as on Earth it is associated with biological activity or with certain geological processes.

10:01:47

[Graphic from orbiter still]

All the instruments – including the neutron detector FREND and the Colour and Stereo Imaging System CaSSIS – performed extremely well during the testing period.

10:01:57

[First images produced by Trace Gas Orbiter CaSSIS instrument, CREDIT ESA/Roscosmos/ExoMars/CaSSIS/UniBE]

CaSSIS has also sent back its first 11 images during a close flyby. It produces colour images by taking four simultaneous images at panchromatic, red, near infrared and blue wavelengths.

Its closest approach was 235 kms from the surface north of the Valles Marineris canyon system.

This image shows a crater 1.4 kms near the rim of a larger crater near the planet’s equator… and this interesting formation is on the side of a large volcano and reveals pit craters. The image width is about 25 kms across.

10:02:39

[CaSSIS camera team plus Mars stills, CREDIT ESA/Roscosmos/ExoMars/CaSSIS/UniBE]

The camera team also produced a 3D reconstruction of a region using a stereo pair of images, showing everything is working as it should be. All the data collected during these tests will help improve the on board software to produce even sharper higher quality images in the future.

10:02:59

[Still images of lander crash site. Credit: NASA/JPL-Caltech/University of Arizona]

Unfortunately – as with many missions to Mars – the technology demonstrator lander, Schiaparelli, fell short of its goals. It collected almost all of its expected data during its descent on October 19th but the craft crashed onto the surface during the last minute before landing. The precise cause is still being investigated but preliminary technical investigations have found that the atmospheric entry and slowing down in the early phases went exactly as planned.

10:03:30

[Animation Schiaparelli lander descent]

The parachute also deployed as expected and the heatshield was released correctly. During the next phase of descent, however, erroneous information was passed onto the guidance and navigation control system – for just one second. When merged into the navigation algorithms, it generated a false altitude of below ground level.

This triggered the release of the parachute and the backshell prematurely. The braking thrusters fired briefly and the on ground systems activated as if it had landed. But the lander was still 3.7 kms above the surface. Crucial lessons will be learnt from this for the 2020 ExoMars mission.

10:04:14]

[Animation ExoMars 2016 Trace Gas Orbiter]

The Trace Gas Orbiter will start aerobraking in March to gradually slow down over the following months. By the end of 2017, the orbiter will be in a lower, near circular orbit of 400 kms and ExoMars’ primary science mission can begin.

10:04:33

[ENDS]

**B-ROLL**

10:04:33

[TITLE] ExoMars – A Promising Future – B-roll

ExoMars launch, 14 March 2016

Launch GVs of the ExoMars mission from Baikonur, Kazakstan.

10:06:34

[TITLE] ExoMars – A Promising Future – B-roll

ExoMars mission control, 19 October 2016

The Trace Gas Orbiter successful enters Mars orbit

GVs of celebration from the ExoMars mission control room at ESA’s European Space Operations Centre (ESOC) at Darmstadt in Germany after confirmation that the Trace Gas Orbiter has entered into orbit around Mars.

10:07:06

[TITLE] ExoMars – A Promising Future – B-roll

Animation, ExoMars 2020 mission

Animation of the recently approved ExoMars 2020 mission, which will contain Europe’s first Mars rover.

10:08:43

[TITLE] ExoMars – A Promising Future – B-roll

First images from ExoMars

The first images acquired by the Colour and Stereo Surface Imaging System (CaSSIS) from the ExoMars Trace Gas Orbiter on 22 November 2016. Video produced by the CaSSIS camera team and the University of Bern.

CREDIT ESA/Roscosmos/ExoMars/CaSSIS/UniBE

[ESA END STING]

10:12:18

end