

IAF SPACE OPERATIONS SYMPOSIUM (B6)
Mission Operations, Validation, Simulation and Training (3)

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EMIRATES MARS MISSION – MISSION OPERATIONS OVERVIEW

Abstract

The Emirates Mars Mission (EMM), also known as “Hope”, is planned to be launched in July 2020 on a Mitsubishi Heavy Industry (MHI) H-IIA rocket from Tanegashima launch site in Japan, and arrive at Mars in early 2021. The mission has been designed to operate for One Martian year (2 Earth years) in Orbit that can be extended for a second Martian year. The Hope probe will be inserted into a high elliptical orbit (20,000 x 43,000 km) with a period of 55 hours, resulting in 3 orbits per week. It will have a total mass of 1337 kg at launch, and carry a combination of three distinct instruments that will image Mars in the visible, thermal infrared and ultraviolet wavelengths: the Emirates eXploration Imager (EXI), the Emirates Mars InfraRed Spectrometer (EMIRS), and the Emirates Mars Ultraviolet Spectrometer

(EMUS) respectively. The launch period will begin with Launch and Early Operations (EOP) Phases that cover the first 45 days in flight, and are dedicated to launch and observatory commissioning and checkout; this will be followed by the Cruise Phase, which consist of 5 months of interplanetary cruise towards Mars. The Observatory will enter Mars Orbit Insertion (MOI) Phase with the final approach to and capture into Mars orbit, followed by a Transition Phase to achieve the final science orbit. The Science Phase will consist of gathering the required science observations and capturing the associated data. An Extended Mission Phase mission could then follow due to the low fuel consumption needed to maintain the primary science orbit. The Mission will end with a Decommissioning Phase in which the Observatory will be configured into a safe configuration that will ensure long-term protection of Mars and its environment. The paper will present the current state of the mission operation after launch along with the operational scenarios and mission operations for each of the phases of the mission.