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Sujet : Mars Climate Orbiter

Document 1: Mars Climate Orbiter

Mars Climate Orbiter (MCO) was the second probe in NASA's Mars Surveyor program (launched December 11, 1999) which also included the Mars Global Surveyor (launched in November 1996) and Mars Polar Lander (launched in January 1999).

Mars Climate Orbiter was designed to arrive at roughly the same time as Mars Polar Lander and to conduct simultaneous investigations of Mars' atmosphere, climate and surface. Arrival in orbit was dated for Sept. 23, 1999. MCO would then reach its operational near-circular Sun-synchronous orbit at about 260 miles by Dec. 1, 1999.

The satellite was also designed to serve as a communications relay for the Mars Polar Lander. After the lander's mission (lasting three months), MCO would have performed a two-year independent mission to monitor atmospheric dust and water vapor and take daily pictures of the planet's surface to construct an evolutionary map of climatic changes.

Scientists hoped that such information would aid in reconstructing Mars' climatic history and provide evidence of buried water reserves. After the end of its main mapping mission Jan. 15, 2001, Mars Climate Orbiter would have acted as a communications relay for future NASA missions to Mars.

After launch, the spacecraft was put into a Hohmann transfer orbit to intersect with Mars. It performed four course corrections: Dec. 21, 1998, and March 4, July 25 and Sept. 15, 1999. At 09:00:46 UT Sept. 23, 1999, the orbiter began its Mars orbit insertion burn as planned. The spacecraft was scheduled to re-establish contact after passing behind Mars, but, unfortunately, no signals were received from the spacecraft.

An investigation indicated that the failure resulted from a navigational error due to commands from Earth being sent in English units (in this case, pound-seconds) without being converted into the metric standard (Newton-seconds). The error caused the orbiter to miss its intended orbit (87 to 93 miles) and to fall into the Martian atmosphere at approximately 35 miles in altitude and to disintegrate due to atmospheric stresses.

https://solarsystem.nasa.gov/missions/mars-climate-orbiter/in-depth/

Document 2:

Newspaper cartoon depicting the incongruence in the units used by NASA and Lockheed Martin scientists that led to the Mars Climate Orbiter disaster. (Source: Slideplayer.com)

Main idea: metric system- space mission – space and universe- conquest of Mars- history of sciences/metric system- investigations on Mars and human knowledge - global scientific collaboration - life on Mars or another planet – space tourism

Others tracks: Space pollution – cold war- new technologies