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Mars Orbiter still going strong

As it outlives its mission life, module to be assigned new tasks by ISRO

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BENGALURU: The Mars Orbiter will complete half a year around the Red Planet on Tuesday and is going strong.

The orbiter has been designed for six months of work. A few more months of wait is needed to know what it has seen and sensed on Mars since September 24 last year. The feat of accomplishing its mission life deserves applause, as was noted in Parliament on Wednesday.

Mars Orbiter Mission (MOM) teams will meet later in March to take stock of its status and plan the next steps that have come as a bonus.

"We need to consolidate and review the data so far, and also make the next plans," V. Kesava Raju, Mars Mission Director for post-launch matters, told *The Hindu*. Detailed analyses of the data it has sent will not be available for some more months, though he said MOM had done a good amount of mapping and imaging. In the six months, the orbiter has been taking Martian surface pictures from distances of around 500 km to 70,000 km. It has mapped the terrain, studied the chemicals present, looked for methane, a sign of ancient or present life, and got a ringside view of a passing comet in October.

Dr. Raju said that as Mars and earth were both moving, the geometry had been changing. This allowed MOM to cover additional Martian surface. So far, MOM's colour camera focussed on wide-angle long shots of Mars. "Perhaps, we can have imageries of higher resolution from shorter distances," he said.

Mars has moved further from earth and is about 346 million km away. MOM left earth on December 1, 2013. Its signals take 19 minutes to reach Earth one-way, longer than the 11 minutes when it entered the Martian orbit six months ago, Dr. Raju said.

Indian spacecraft, with a few exceptions, have outlived their lifespan by a few years, but these were operating closer home, at up to 36,000 km from ground. "It looks like MOM can go on for at least another six months," said an ISRO official who did not wish to be named.

Precise moves

Precision in calculating every distance and timing each manoeuvre clinched the mission's success. The official said fuel was saved at every stage: when the orbit was increased five times in its early phase under earth's gravitational field in November 2013; when the orbiter was sent off earth; when two mid-course corrections were avoided during the 10-month journey; and finally while locking MOM on to the Martian orbit.

MOM will go through a 15-day "blackout" or eclipsed period from June 8 to 22. Communication with earth will be snapped as sun will block the planet from Mars and MOM, Project Director S. Arunan said at the Indian Science Congress in January.

During this period, the orbiter must take its own decisions in an autonomous mode and will consume more fuel. How much longer it will last and with how much fuel will be left will depend on this phase. If MOM keeps up its longevity streak, it will next face a "whiteout" a year later when Earth will come between Sun and Mars and communication will go blank again.