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Rashid Rover in sight of key milestones

HEAD OF EMIRATES LUNAR MISSION ELUCIDATES ON APPROACHING CRUCIAL PHASE OF SPACE VOYAGE

DUBAI
BY ANGEL TESORERO
Senior Reporter

Engineers at the Mohammed Bin Rashid Space Centre (MBRSC) are now preparing for the next 'critical stages' of the first Emirates Lunar Mission (ELM), following the successful launch of the UAE-made Rashid Rover on December 11.

The Moon-bound rover is safely stored in a special compartment of the Japanese lunar lander Hakuto-R that is currently 500,000 kilometres from Earth, 10 days after it was sent into space on a SpaceX Falcon 9 rocket from Cape Canaveral Space Force Station in Florida, USA.

All telemetry data received daily by the mission control centre at MBRSC indicate that the compact lunar rover is in good health, Dr Hamad Al Marzooqi, ELM project manager, said in an exclusive interview with *Gulf News*.

"That is a very good sign in our mission," noted Al Marzooqi, adding: "There will be some critical points in the coming weeks – we are looking forward to them and we will keep everyone posted once we reach those points."

Orbital control manoeuvres

The critical stages include orbital control manoeuvres that will be conducted by Hakuto-R during its cruise period. The Japanese-made lunar lander carrying Rashid Rover and other payload to the Moon is taking a circuitous but economical route. It is expected to land on the Moon's southeastern outer edge of Mare Frigoris (Sea of Cold) in April next year.

Al Marzooqi explained why Hakuto-R is not taking the short-



Ahmed Ramzan/Gulf News

■ Dr Hamad Al Marzooqi, Project Manager of Emirates Lunar Mission at MBRSC, says all data received by the mission control centre suggests that Rashid Rover is in good health.

est path to the Moon. He said: "You can reach the Moon within six days after launch as were done by Apollo missions in the 1960s and 70s. But the approach taken by the lander is a low-cost trajectory to reduce the amount of fuel needed to reach the Moon."

Instead of fuel, Hakuto-R will use the gravity of the Earth, Moon, and Sun to reach the lunar orbit. This means, the lander will first cruise – using less fuel – beyond the Moon's orbit, which is about 1.4 million kilometres away from Earth, and from that far dis-

tance, Hakuto-R will do a deep space manoeuvre, turn around, and start the trajectory to insert itself into the lunar orbit.

Communication challenge

Al Marzooqi observed that communication with Hakuto-R will be slow during the deep space manoeuvre as the lander will be at its farthest point from Earth.

"Currently, Rashid Rover onboard Hakuto-R is 500,000 kilometres away from Earth and we will reach the farthest point at 1.4 million kilometres away in the

next couple of weeks," he added.

The next critical stage will be the lunar orbit insertion (LOI). Using the gravity of the Moon, the Japanese-made lander will first orbit the Moon for about two weeks (according to ispace, maker of Hakuto-R) and each circle will take it closer to the surface with an increasingly elliptical trajectory before angling itself vertically to softly land on the lunar surface and perform a fully-automated landing.

This landing would be the most critical part of the lunar mission, with several missions

There will be some critical points in the coming weeks – we are looking forward to them and we will keep everyone posted once we reach those points.

Dr Hamad Al Marzooqi
ELM project manager

1.4km
farthest point of the mission, due in next couple of weeks

having failed before, including those from India and Israel.

Al Marzooqi said: "Rashid Rover is secured inside the lander by a robotic arm. Once Hakuto-R safely lands, the rover will be released and we can start our operation where we will deploy the mast and antenna of the rover."

"Following check-up and calibration of all instruments and ensuring that all systems are working properly, the 'big moment' will happen when Rashid Rover will touch the lunar surface and we can declare that the UAE has stepped on the moon for the first time."

Video: Head of Emirates Lunar Mission shares insights

