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GAGANYAAN MISSION

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Gaganyaan's Flight Test Vehicle Abort Mission-1 will lift off from the first launch pad of the Satish Dhawan Space Centre in Sriharikota. Photo: X/@ISRO via ANI

The Indian Space Research Organisation (ISRO) on October 21 will conduct the Gaganyaan's first Flight Test Vehicle Abort Mission-1 (TV-D1), which will demonstrate the performance of the Crew Escape System.

The TV-D1 will lift off at 8 a.m. on October 21 from the first launch pad of the Satish Dhawan Space Centre in Sriharikota.

According to ISRO, the test vehicle developed for this abort mission is a single-stage liquid rocket. The payloads consist of the Crew Module (CM) and Crew Escape Systems (CES) with their fast-acting solid motors, along with CM fairing (CMF) and Interface Adapters.

The CM is where the astronauts are contained in a pressurised earth-like atmospheric condition during the Gaganyaan mission. For the TV-D1, the CM is an unpressurised version.

"This flight will simulate the abort condition during the ascent trajectory corresponding to a Mach number of 1.2 encountered in the Gaganyaan mission. CES with CM will be separated from the Test Vehicle at an altitude of about 17km. Subsequently, the abort sequence will be executed autonomously commencing with the separation of CES and deployment of the series of parachutes, finally culminating in the safe touchdown of CM in the sea, about 10 km from the coast of Sriharikota," ISRO said.

The entire duration of the flight from lift off to CES and CM separation to deployment of parachutes and touch down of the crew module in the sea about 10 km from the coast of Sriharikota will be completed in about eight and half minutes.

ISRO said that the Indian Navy will lead the recovery of the TV-D1 CM after touchdown. Recovery ships positioned at a safe range in sea waters will approach the CM and a team of divers will attach a buoy, hoist the CM using a ship crane and bring it to the shore.

The objectives of this mission are flight demonstration and evaluation of test vehicle sub-systems, evaluation of CES including various separation systems and CM characteristics and deceleration systems demonstration at higher altitude and its recovery.

Simply put, the objective of the mission is to check the safety of the CES for its capabilities to take the CM to safety in case of an emergency that will require ISRO to abort the mission.

The Gaganyaan mission aims to demonstrate the capability to launch human beings (three crew members) to low earth orbit and bring them back safely to earth by landing them in either the Bay of Bengal or the Arabian Sea.

Prior to the first crewed flight, three test vehicles (TV) flights have been planned: TV-1, TV-2 and TV-3.

Saturday will be the first flight, and the beginning of next year, one more unnamed flight will carry the humanoid VyomMitra. Subsequently, manned flight is expected to take place in 2025.

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