Pushpak, ISRO's reusable launch vehicle, clears test

This is the third and final test in the series of LEX (03) which was conducted

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THE HINDU BUREAU

The winged vehicle, Pushpak, was released from an Indian Air Force Chinook Helicopter at an altitude of 4.5 km. | Photo Credit: Special Arrangement

The Indian Space Research Organisation (ISRO) completed the third Reusable Launch Vehicle (RLV) Landing Experiment (LEX) on June 23 at the Aeronautical Test Range (ATR) in Chitradurga, Karnataka.

This is the third and final test in the series of LEX (03) which was conducted at 7.10 a.m.

"Following the success of the RLV LEX-01 and LEX-02 missions, RLV LEX-03 re-demonstrated the autonomous landing capability of the RLV under more challenging

release conditions (cross range of 500 m against 150 m for LEX-02) and more severe wind conditions," ISRO said.

On Sunday morning, the winged vehicle, Pushpak, was released from an Indian Air Force Chinook Helicopter at an altitude of 4.5 km.

ISRO said that from a release point 4.5 km away from the runway, Pushpak autonomously executed cross-range correction manoeuvres, approached the runway and performed a precise horizontal landing at the runway centreline.

"Due to this vehicle's low lift-to-drag ratio aerodynamic configuration, the landing velocity exceeded 320 kmph, compared to 260 kmph for a commercial aircraft and 280 kmph for a typical fighter aircraft. After touchdown, the vehicle velocity was reduced to nearly 100 kmph using its brake parachute, after which the landing gear brakes were employed for deceleration and stop on the runway. During this ground roll phase, Pushpak utilises its rudder and nose wheel steering system to autonomously maintain a stable and precise ground roll along the runway," the space agency said.

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It added that this mission simulated the approach and landing interface and high-speed landing conditions for a vehicle returning from space, reaffirming ISRO's expertise in acquiring the most critical technologies required for the development of a Reusable Launch Vehicle (RLV).

"Through this mission, the advanced guidance algorithm catering to longitudinal and lateral plane error corrections, which is essential for the future Orbital Re-entry Mission has been validated," the space agency said.

It said that the RLV-LEX uses multisensor fusion including sensors like the Inertial sensor, Radar altimeter, Flush air data system, Pseudolite system and NavIC. Notably, the RLV-LEX-03 mission reused the winged body and flight systems as such without any modification, from the LEX-02 mission, demonstrating the robustness of ISRO's capability of design to reuse flight systems for multiple missions.

“This mission simulates the approach & landing interface and high-speed landing conditions for a vehicle returning from space, which will reaffirm ISRO’s expertise in acquiring the most critical technologies required for the development of a Reusable Launch Vehicle (RLV),” ISRO said.