Anomaly detection, abortion, quick launch show challenges — and capabilities

ISRO TAKES A DIP IN SEA BEFORE GAGANYAAN SOARS

ALL GOALS MET

1. **10am:** Test vehicle carrying the crew escape system and crew module lifts off from Satish Dhawan Space Centre
2. **Crew escape system plunges** into the sea 14km off the coast
3. **Parachuted Crew module splashes down** in under 10 mins. **Indian Navy recovers** the crew module

Chethan.Kumar@timesgroup.com

Sriharikota: 10, 9, 8, 7, 6, 5 ... Hold! This message at the mission control room at Isro's Satish Dhawan Space Centre at Sriharikota at 8.44am on Thursday made scientists – and millions of others watching the live streaming of the first Gaganyaan test vehicle demonstration (TV-D1) – hold their breath. Only 45 minutes ago, the lift-off of the rocket, initially scheduled at 8am, was put on hold twice because of unfavourable weather.

It was a monitoring anomaly, which we identified fast and corrected. We went through the automatic launch sequence again and the computers authorised the launch.

S Somanath, CHAIRMAN, ISRO

The concern quickly made way for anticipation as Isro rescheduled the lift-off at 10am. In less than ten minutes after the rocket took to the skies, the crew module was parachuted to make a gentle splash in the Bay of Bengal before a Navy ship retrieved it. Isro had successfully done the first test of the crew rescue system after inducing an 'inflight abort'.

As it turned out, the 'hold' just five seconds before the intended lift-off at 8.45am was decided by an onboard 'automatic launch sequence' (ALS). "It was a monitoring anomaly," said Isro chairman after the mission. "We identified it fast and corrected it. It took us some time to refill the gases and make the stage ready within the launch window. I'm happy that the team was able to identify and rectify the problem quickly." More details, he said, would be available after a detailed analysis.

The series of events on Saturday shows Isro has systems in place not only to catch anomalies which otherwise would put human lives in danger, but also to set them right and accomplish the mission. This, however, was but only the first in a series of tests Isro will carry out before Gaganyaan takes off with the first set of astronauts to space, possibly in 2025.

"The computer caught the anomaly correctly," said a senior scientist. "We reached the vehicle and found that the problem could be solved without calling off the launch. The important thing is that our systems have shown their overall reliability."

Redundancies are part of every Isro mission and for Gaganyaan, the space agency has been doubling it — from a double-redundancy system to quadruple one — in all the systems and sub-systems. And, as the ALS computer exhibited on Saturday, given the complexity of space missions and their high cost, it is better to pause and be safe than to proceed and be sorry.

Pics: ISRO/Indian Navy

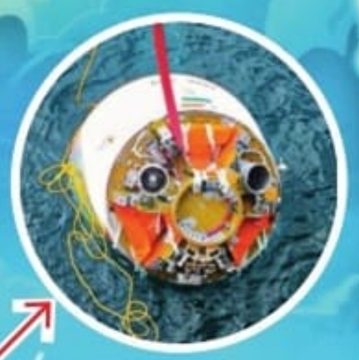

Illustration: **Shinod Akkaraparambil**