

Unit 25. India's Reusable Launch Vehicle (RLV)- Everything you need to know



India successfully tested the launched of indigenously made **Reusable Launch Vehicle (RLV)**, capable of launching satellites into orbit around earth and then re-enter the atmosphere, from Sriharikota in Andhra Pradesh. RLV is dubbed as **India's own space shuttle**. (The 'Space Shuttle' was a partially reusable low Earth orbital spacecraft system operated by the U.S. National Aeronautics and Space Administration (NASA), as part of the Space Shuttle program.)

What's the significance of Reusable Launch Vehicle (RLV)?



- RLV is the unanimous solution to achieve low cost, reliable and on—demand space access.
- The making of the **Indian space shuttle** or RLV-TD has taken five years and the government has invested Rs. 95 crore in the project.
- This flight will test the capability of the vehicle to survive a re-entry at speeds higher than that of sound.
- The solution to reducing cost of launching satellites into orbit is to recycle the rocket or make it reusable.
- Scientists at ISRO believe that they could reduce the cost by as much as 10 times if reusable technology succeeds, bringing it down to \$2,000 per kg from the present \$20,000 per kg.

What about NASA's space shuttle programme?

Nasa grounded its space shuttle programme in 2011 after using its **reusable vehicles** like Discovery, Endeavor, Columbia and Challenger for over three decades to launch various **missions**, including the International Space Station (ISS) and the Hubble telescope.

Everything you need to know about India's Reusable Launch Vehicle (RLV) and Hypersonic flight experiment

Launch of India's first indigenous space shuttle RLV-TD is the result of the industrious efforts of our scientists. Congrats to them.

- Scientists at ISRO tested the **RLV Technology Demonstrator (TD)**, in the first experiment of its kind known as Known as **hypersonic flight experiment**.
- It was about 10 minutes mission from liftoff to splashdown.
- The purpose of the experiment is to help the shuttle glide over a virtual runway in the Bay of Bengal, situated 500 km from the coast.
- The RLV-TD is unlikely to be recovered from sea (Bay of Bengal) during this experiment as it is expected that the vehicle will disintegrate on impact with water since it is not designed to float.
- The 6.5 meter long Re-usable Launch Vehicle – Technology Demonstrator (RLV-TD) weighed about 1.7 tons.
- The special booster or the first stage is powered using a solid fuel that hoist the RLV-TD prototype to about 70 km into the atmosphere from where the descent began. During the descent phase, small thrusters helped the vehicle navigate itself to the landing area.
- The final version will take at least 10-15 years to get ready.

List of India's launchers:

1. SLV – Historic
2. ASLV – Historic
3. PSLV – Operational
4. GSLV – Operational (Read about the launch of GSLV D5)
5. Sounding Rockets – Operational
6. LVM (GSLV Mark 3) – Future

Types of India's space crafts

1. Communication Satellites
2. Earth Observation Satellites
3. Navigation Satellites
4. Scientific Exploration Satellites
5. Experimental Satellites
6. Small Satellites
7. Student Satellites

Major Missions

1. Mars Orbiter Mission
2. LVM3-X (CARE)
3. GSAT-16 (using cryogenic engine)
4. PSLV-C27/IRNSS-1D (navigation satellites)
5. PSLV C37 (104 satellites).



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