



Completion of SSLV Development Project

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Why in News?

The [Indian Space Research Organisation \(ISRO\)](#) successfully launched the third developmental flight of the [Small Satellite Launch Vehicle \(SSLV\)](#).

- It placed the [Earth observation satellite](#) EOS-08 precisely into orbit. It also marked the completion of ISRO/Department of Space's SSLV Development Project.

What are Key Facts about SSLV?

▪ About:

- ISRO's SSLV is a three-stage [Launch Vehicle](#) configured with three Solid Propulsion Stages.
 - It also has a liquid propulsion-based [Velocity Trimming Module \(VTM\)](#) as a terminal stage to help adjust the velocity to place the satellite in orbit.

▪ Need of SSLVs:

- The aim behind SSLVs is to make **low-cost launch vehicles** with **short turnaround times** and minimal infrastructural requirements.
- The SSLV is capable of launching [Mini, Micro or Nanosatellites \(10 to 500 kg mass\)](#) into a **500 km orbit**.
- Satellite launches by businesses, government agencies, universities and laboratories need smaller payloads.
 - [New Space India Limited \(NSIL\)](#) is the **commercial arm of ISRO** with the primary responsibility of facilitating Indian industries to take up advanced technology space related activities.

▪ Benefits of SSLV:

- It takes only **72 hours to integrate**, unlike the 70 days for [Polar Satellite Launch Vehicle \(PSLVs\)](#) and [Geosynchronous Satellite Launch Vehicles \(GSLVs\)](#).
- It is an on-demand vehicle. **Only six people are needed to complete** the job quickly and at a **cost of around Rs 30 crore**.

What are PSLVs and GSLVs?

- **PSLVs:** It is the **third generation** of Indian satellite launch vehicles.
 - It was first used in **1994** and more than **50 successful PSLV launches** have taken place.
 - It has also been called **"the workhorse of ISRO"** for consistently delivering various satellites into low earth orbits (less than 2,000 km in altitude) with a high success rate.
 - It successfully launched two spacecraft **"[Chandrayaan-1](#) in 2008 and [Mars Orbiter Mission](#) in 2013"**.
 - It can take up to 1,750 kg of payload to [Sun-Synchronous Polar Orbits \(SSPO\)](#) of 600 km altitude.
 - **SSPO is synchronous with the sun** i.e., they pass over an Earth region at the **same local time every day**.

- **GSLVs:** It has been designed, developed, and operated by ISRO to launch satellites and other space objects into [Geosynchronous Transfer Orbits \(GTO\)](#).
 - GTO is an **elliptical orbit** that a spacecraft takes as the first step towards achieving a [geosynchronous or geostationary orbit](#) around Earth.
 - GSLV is a three-stage vehicle.
 - The first stage comprises **solid booster**, second stage is a **liquid engine** and third stage is the indigenously built [Cryogenic Upper Stage \(CUS\)](#) carrying cryogenic propellants.

NewSpace India Limited (NSIL)

- NSIL is a wholly owned Government of India company, under the administrative control of the **Department of Space (DOS)**.
- The major business areas of [NSIL](#) include:
 - Production of **Polar Satellite Launch Vehicle (PSLV)** and **Small Satellite Launch Vehicle (SSLV)** for industry.
 - Production and marketing of **space-based services**, including launch services and space-based applications like transponder leasing, [remote sensing](#) and mission support services.
 - Building of **Satellites** (both Communication and Earth Observation) as per user requirements.
 - Transfer of technology developed by ISRO centers/ units and constituent institutions of Department of Space.

Read more: [Indian Space Situational Assessment Report 2023](#), [India's Space Launch Vehicle Supply and Demand](#), [Space Tourism](#)

UPSC Civil Services Examination, Previous Year Question

Q. In which of the following activities are Indian Remote Sensing (IRS) satellites used? (2015)

1. Assessment of crop productivity
2. Locating groundwater resources
3. Mineral exploration
4. Telecommunications
5. Traffic studies

Select the correct answer using the code given below:

- (a) 1, 2 and 3 only
- (b) 4 and 5 only
- (c) 1 and 2 only
- (d) 1, 2, 3, 4 and 5

Ans: (a)

Q. With reference to India's satellite launch vehicles, consider the following statements: (2018)

1. PSLVs launch the satellites useful for Earth resources monitoring whereas GSLVs are designed mainly to launch communication satellites.

2. Satellites launched by PSLV appear to remain permanently fixed in the same position in the sky, as viewed from a particular location on Earth.
3. GSLV Mk III is a four-staged launch vehicle with the first and third stages using solid rocket motors; and the second and fourth stages using liquid rocket engines.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 and 3
- (c) 1 and 2
- (d) 3 only

Ans: (a)

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