GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 918

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 04, 2026

STRENGTHENING NATIONAL SPACE INFRASTRUCTURE

918. SHRI SHASHANK MANI:

SHRI JASHUBHAI BHILUBHAI RATHVA:

MS. KANGNA RANAUT:

SHRI RAMESH AWASTHI:

Will the PRIME MINISTER be pleased to state:

(a) the details of progress made in strengthening national launch and space infrastructure during 2025 including establishment of new launch pads and facilities supporting next-generation launch vehicles;

(b) the advancements achieved in indigenization or critical space technologies such as propulsion systems, microprocessors and electric propulsion;

(c) the details of the role of academia, start-ups and private industry in supporting ISRO missions through technology transfer and incubation mechanism; and

(d) the details of the impact of recent international collaborations and leadership roles undertaken by India in global space exploration and disaster management initiatives?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH):

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(a) Progress made in strengthening national launch and space infrastructure during 2025:

- **The SPADEX mission successfully demonstrated autonomous docking and undocking, along with power transfer between satellites—a major step towards in-orbit servicing capabilities and docking operations on space stations. This was further complemented by the successful circumnavigation of the SPADEX satellites. This achievement made India the fourth nation to demonstrate docking in space.**
- **The PSLV Orbital Experimental Module (POEM-04), which was also part of the PSLV-C60 / SPADEX mission, flew with multiple payloads from ISRO, space startups & academia, fostering innovation through in-orbit experimentation. The POEM-4 completed more than 1000 orbits and was a highly successful POEM mission. The mission also demonstrated a robotic arm in-orbit and the germination of seeds in microgravity.**
- **The GSLV-F15/NVS-02 mission in January 2025 was the 100th mission to lift-off from Sriharikota. The launch vehicle performed excellently by precisely injecting the satellite to its intended orbit.**

- **The GSLV-F16/NISAR mission scored yet another first by becoming the first joint ISRO-NASA mission. It is significant that the one of the most expensive payloads in the earth observation segment with 12m unfurlable antenna from NASA was integrated on an Indian satellite bus and launched on an Indian launch vehicle. NISAR, the first dual frequency SAR satellite, along with NASA's L-band SAR payload & ISRO's S-band SAR payload is now fully operational.**
- **The LVM3-M5 / CMS-03 mission is another unique mission where ISRO achieved the milestone of the heaviest GTO satellite from the Indian soil.**
- **The LVM3-M6 / BlueBird Block-2 set the record of the launch of heaviest ever satellite from Indian soil. This mission also validated the electro-mechanical actuation for the S200 motor along with composite thrust frame for C25 stage and other modifications to improve the payload performance by 176 kg. We can confidently say that the S200 EMA is globally the most powerful space qualified electric actuation system compared to the other launchers that use EMA for solid motors.**
- **The Department obtained financial approval from the Government for the establishment of the Third Launch Pad at Sriharikota as part of the essential launch infrastructure required for Next Generation Launch Vehicles. A dedicated launch site is being established for the Small Satellite Launch Vehicle (SSLV) at Kulasekarapattinam, Tamil Nadu for which the**

construction activities for the launch pad facilities and integration building have commenced.

- **A 10t vertical mixer for solid propellant production was commissioned at Sriharikota, Andhra Pradesh along with the second process line at the Ammonium Perchlorate Plant, Alwaye, Kerala to enhance the solid motor production capacity. A Cryogenic Turbopump Test facility has also been commissioned to enhance the throughput for the testing & acceptance of cryogenic engine subsystems. Integrated Titanium alloy Tank Production facility, which is a unique end-to-end facility for realizing spacecraft propellant tanks & PSLV upper stage tanks was also commissioned in 2025 at Tumakuru, Karnataka.**

(b) ISRO completed the development and qualification of a high thrust electric propulsion system of 300mN thrust rating to power spacecraft propulsion systems, which is envisaged to be demonstrated in a Technology Demonstration Satellite. ISRO demonstrated the re-ignition of thrust chamber in the LVM3-M5 mission in November 2025 paving the way for restart of cryogenic stage in future LVM3 flights thereby enabling mission flexibility. Further, ISRO successfully demonstrated boot-strap mode starting of a gas-generator cycle cryogenic engine without any auxiliary start-up system through a ground test in November 2025. ISRO is working on reusable space transportation technologies and technology demonstration flights are planned to demonstrate stage recovery. Towards

this, ground tests to demonstrate throttling of Vikas engine were also conducted successfully.

ISRO has designed & developed 32-bit indigenous processor (VIKRAM3201) jointly with Semiconductor Laboratory (SCL), Chandigarh, which is the first 32-bit processor in the country qualified for space applications. The 16-bit version, VIRKAM1601, which was realized earlier by ISRO, has already been inducted in the avionics systems of all the launch vehicles of ISRO. ISRO has also realized another indigenous microprocessor, KALPANA32 jointly with SCL, which is a processor based on the SPARC architecture. In the field of microprocessors, indigenisation efforts include On Board Controller, payload controllers, data acquisition and beamforming unit.

(c) ISRO supports academia through its Space Technology Incubation Centres (STICs) programme, which promotes and nurtures young innovators by helping them convert their ideas into space-worthy components for the Indian Space Programme.

ISRO has transferred Small Satellite Launch Vehicle (SSLV) technology to M/s Hindustan Aeronautics Limited (HAL) and has also transferred technologies such as Lithium-Ion Battery, Integrated Modular Avionics (IMA) Bus, Distress Alert System, and various sensors to private industries to facilitate further productionization and the growth of the space ecosystem in the country.

Many Indian Industries are involved in ISRO's effort to realise SSLV through industry. Several Indian industries/ start-ups are

involved in building micro-earth observation satellites and related ground segment infrastructure. 3 industries are involved in manufacturing about 1 lakh 2-way MSS terminal to be fitted in fisherman's boat, etc. Further, M/s. NewSpace India Limited through ISRO and IN-SPACe has signed 100 Technology Transfer Agreements till date to transfer technologies developed at ISRO to Private Industries/ Start-ups to promote the space ecosystem in the country.

(d) Indian Space Research Organisation (ISRO) continue to pursue successful space cooperation with space faring and space aspiring nations. Some of the recent impacts of international space cooperation are given here:

- **In the year 2025, 10 cooperative documents were signed with international partners for: setting up of NavIC reference station in South Africa; travel of Indian astronaut to international space station; pursuing human space flight cooperation with European space agency; establishing temporary ground station in Australia; continuous operation of ground station in Mauritius; working for a joint lunar mission with Japan; accommodating a Swedish instrument onboard upcoming Venus Orbiter Mission and initiating cooperation with new space entities of Saudi Arabia, Philippines, and Republic of Korea.**
- **NISAR satellite, jointly built by ISRO and NASA was launched by ISRO's launch vehicle in July 2025.**
- **ISRO has installed a NavIC timing receiver at the Italian National Institute of Metrological Research (INRIM).**

- **Indian officials hold leadership roles in two working groups under the Scientific and Technical Sub Committee of UNCOPUOS.**

ISRO's active involvement in international disaster management initiatives such as International Charter Space and Major Disasters and Sentinel Asia helped India to receive more than 2,260 satellite datasets during the last three years, for generating timely inputs for management of major disasters that affected the country during this period.

ISRO also provided more than 725 IRS satellite datasets for global disaster management initiatives, reinforcing India's commitment to respond to global humanitarian causes.

ISRO successfully conducted the lead role of International Charter Space and Major Disasters for six months in 2025. During the lead role period, it coordinated 39 activations of the Charter for rapid information dissemination, on-boarded four new authorized users; ensuring wider reach of space-based services for developing nations, and effectively coordinated smooth functioning of the Charter. It also on-boarded GHGSat (Green House Gas emission measuring Satellite) as new data source and improved the visualisation of the Charter's portal.

ISRO is also Co-chairing the Sentinel Asia steering committee, providing strategic guidance on use of space technology for disaster management in the Asia-Pacific region. In 2026, India will be hosting the annual meetings of (i) International Committee on Global Navigation Satellite System (ICG); (ii) BRICS Heads of Space Agencies; and (iii) International Planetary Data Alliance.

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