REPORT NO.
410

सत्यमेव जयते

PARLIAMENT OF INDIA
RAJYA SABHA

DEPARTMENT-RELATED PARLIAMENTARY STANDING COMMITTEE ON SCIENCE AND TECHNOLOGY, ENVIRONMENT, FORESTS AND CLIMATE CHANGE

FOUR HUNDRED TENTH REPORT

DEMANDS FOR GRANTS (2026-27) OF THE DEPARTMENT OF SPACE (DEMAND NO. 95)

(Presented to the Rajya Sabha on 25th March, 2026)
(Laid on the Table of Lok Sabha on 25th March, 2026)

भारतीय संसद, राज्य सभा
Parliament of India, Rajya Sabha

Rajya Sabha Secretariat, New Delhi
March, 2026/Chaitra, 1948 (Saka)

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C O N T E N T S

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* To be appended later

COMPOSITION OF THE COMMITTEE
(2025-26)

(Constituted w.e.f. 26th September, 2025)

1. **Shri Bhubaneswar Kalita - Chairman**

RAJYA SABHA

2. Shri Narayanasa K. Bhandage
3. Ms. Indu Bala Goswami
4. Shri I.S. Inbadurai
5. Shri Parimal Nathwani
6. Shri Sandosh Kumar P
7. Shri Sharad Pawar
8. Shri Jairam Ramesh
9. Shri K. R. Suresh Reddy
10. Shri Paka Venkata Satyanarayana

LOK SABHA

11. Shrimati Sajda Ahmed
12. Shri Alfred Kanngam S. Arthur
13. [*] *Vacant*
14. Shri Phani Bhusan Choudhury
15. Shri Biplab Kumar Deb
16. Shri Vamsi Krishna Gaddam
17. Shri Tapir Gao
18. Adv K. Francis George
19. Shri Eswarasamy K.
20. Shri Mahesh Kashyap
21. Dr. Anand Kumar
22. Shri Mohibbullah
23. Shri Jagdambika Pal
24. Shri Jashubhai Bhilubhai Rathva
25. Shri Trivendra Singh Rawat
26. Shrimati Himadri Singh
27. Shri Tejasvi Surya
28. Shri Durai Vaiko
29. Shri Yaduveer Wadiyar
30. Shri Balwant Baswant Wankhade
31. Shri Akhilesh Yadav

SECRETARIAT

Dr. K.S. Somashekhar, *Additional Secretary*
Shri Rakesh Naithani, *Joint Secretary*
Shri Arun Kumar, *Director*
Shri Rajiv Saxena, *Deputy Secretary*
Ms. I. V. Rajya Laxmi, *Under Secretary*
Shri Vaibhav Jain, *Committee Officer*

[*] Shri Pradyut Bordoloi ceased to be member of the Committee consequent upon his resignation from the Lok Sabha w.e.f. 20.03.2026.

INTRODUCTION

I, the Chairman of the Department-related Parliamentary Standing Committee on Science and Technology, Environment, Forests and Climate Change, having been authorised by the Committee, present this 'Four Hundred Tenth Report' on Demands for Grants (2026-27) of the Department of Space.

2. The Committee considered the Demands for Grants (2026-27) pertaining to the Department of Space in its meeting held on the 26th February, 2026. It held detailed discussion with the Secretary and other officers of the Department of Space.

3. The Committee expresses its thanks to the officers of the Department of Space for providing the material and information, to enable it to examine the Demands for Grants of the Department for the year 2026-27.

4. The Committee considered and adopted the Report in its meeting held on the 24th March, 2026.

(BHUBANESWAR KALITA)
Chairman,
Department-related Parliamentary Standing Committee on Science and Technology, Environment, Forests and Climate Change,
Rajya Sabha.

NEW DELHI;
24th March, 2026
Chaitra 03, 1948 (Saka)

ACRONYMS

BAS	Bharatiya Antariksh Station
CBM	Common Berthing module
CES	Crew Escape System
CSR	Corporate Social Responsibility
DOS	Department of Space
EEE	Electrical, Electronic and Electromechanical
FDI	Foreign Direct Investment
FLP	First Launch Pad
FRAMS	Forest Resources Analysis and Monitoring System
GNSS	Global Navigation Satellite Systems
GSAT	Geosynchronous Satellite
GSLV	Geosynchronous Satellite Launch Vehicle
HLVM3	Human Rated Launch Vehicle
HSFC	Human Space Flight Centre
IDRSS	Indian Data Relay Satellite System
IEBR	Internal and Extra Budgetary Resources
IIST	Indian Institute of Space Science and Technology
IST	Indian Standard Time
IN-SPACe	Indian National Space Promotion & Authorization Centre
INSAT	Indian National Satellite
IPRC	ISRO Propulsion Complex
ISRO	Indian Space Research Organisation
IIRS	Indian Institute of Remote Sensing
IIST	Indian Institute of Space Science and Technology
IISU	ISRO Inertial Systems Unit
ISTRAC	ISRO Telemetry, Tracking & Command Network
JAXA	Japan Aerospace Exploration Agency
LEO	Low Earth Orbit
LEOS	Laboratory for Electro-Optics Systems
LME	LOX-Methane Engine
LPSC	Liquid Propulsion Systems Centre
MCF	Master Control Facility
MOF	Ministry of Finance
MoU	Memorandum of Understanding
NARL	National Atmospheric Research Laboratory
NASA	National Aeronautics and Space Administration
NavIC	Navigation with Indian Constellation
NER	North Eastern Region
NE-SAC	North-Eastern Space Applications Centre

NETRA	Network for Space Objects Tracking and Analysis
NGEs	Non-Governmental Entities
NGLV	Next Generation Launch Vehicle
NNRMS	National Natural Resources Management System
NRSC	National Remote Sensing Centre
NSIL	New Space India Limited
NSTL	Naval Science and Technological Laboratory
PIE	Pre-incubation Entrepreneurship
PIF	PSLV Integration Facility
PNT	Positioning, navigation, and timing
PRL	Physical Research Laboratory
PSLV	Polar Satellite Launch Vehicle
POEM	PSLV Orbital Experimental Module
R&D	Research and development
RE	Revised Estimates
RLV	Reusable Launch Vehicle
RLV-TD	Reusable Launch Vehicle – Technology Demonstrator
SAC	Space Applications Centre
SCL	Semi-Conductor Laboratory
SDSC- SHAR	Satish Dhawan Space Centre- Sriharikota Range
SSLV	Small Satellite Launch Vehicle
SSPO	Sun-synchronous Polar Orbit
SLP	Second Launch Pad
SPADEX-2	Space Docking Experiment – 2
TDS	Technology Demonstration Spacecraft
TTA	Technology Transfer Agreement
TTF	Technology Transfer Fees
URSC	U R Rao Satellite Centre
VSSC	Vikram Sarabhai Space Centre
VTVL	Vertical Take-off and Vertical Landing

REPORT

INTRODUCTION

The Government of India set up the Space Commission and the Department of Space (DOS) in 1972. The DOS is responsible for implementing the policies framed by the Space Commission. These are carried out by the Department through the Indian Space Research Organisation (ISRO) and the Grant-in-aid institutions viz., Physical Research Laboratory (PRL), National Atmospheric Research Laboratory (NARL), North-Eastern Space Applications Centre (NE-SAC) and Indian Institute of Space Science and Technology (IIST).

2. The Secretariat of the Department of Space and the Headquarters of ISRO are located in Bengaluru. The Programme Offices at ISRO Headquarters co-ordinate the overall programmes like Satellite Communication, Satellite Navigation, Earth Observation, Space Transportation Systems, Space Science and Planetary Exploration, Climate & Atmospheric Programme, Disaster Management Support, National Natural Resources Management System (NNRMS), International Co-Operation, Capacity Building, Media & Public Relations, Budget & Economic Analysis and Human Resources Development.

3. **Major Centres/Units of DOS/ISRO:** The major Centres, Units and establishments of DOS/ISRO, responsible for carrying out research and development activities as well as for undertaking various projects and programmes, are given below:

a) Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram, provides the technology base for the country's indigenous launch vehicle (rocket) development;

b) Liquid Propulsion Systems Centre (LPSC), with its facilities located at Bengaluru and Thiruvananthapuram, is responsible for development of liquid propulsion and cryogenic propulsion systems for satellite and launch vehicles;

c) Satish Dhawan Space Centre (SDSC-SHAR) at Sriharikota, Andhra Pradesh, is the spaceport of India providing launch base to indigenously built launch vehicles. Also, it provides the facilities for processing of solid rocket motors;

d) Human Space Flight Centre (HSFC) is created with the responsibility to act as the lead centre for Human Spaceflight Program. This centre is responsible

for the execution of Gaganyaan programme that envisages sending a crew of astronauts to space and bring them back safely to earth.

e) U R Rao Satellite Centre (URSC), Bengaluru, is entrusted with the prime responsibility for development of satellites;

f) Space Applications Centre (SAC), Ahmedabad, carries out research and development in space applications as well as development of application payloads;

g) National Remote Sensing Centre (NRSC), Hyderabad is responsible for satellite data acquisition and processing, data dissemination, aerial remote sensing and decision support for disaster management.

h) The Laboratory for Electro-Optics Systems (LEOS), Bengaluru has the responsibility for development and production of electro optical sensors for satellites;

i) ISRO Propulsion Complex (IPRC) located at Mahendragiri has the responsibility for assembly, integration and testing of storable and cryogenic liquid rocket engines and stages, spacecraft thrusters testing in sea level and high-altitude conditions, storage of liquid and cryogenic propellants and production of liquid hydrogen.

j) ISRO Telemetry, Tracking & Command Network (ISTRAC), with its ground stations at Bengaluru, Sriharikota, Lucknow, Bearslake, Biak (Indonesia), Brunei and Mauritius provides the telemetry, tracking and command support and spacecraft mission management for the Indian remote sensing satellite missions, space science missions and satellite launch vehicle programmes;

k) Master Control Facility (MCF) with its main facility at Hassan, Karnataka and backup facility at Bhopal, Madhya Pradesh has the responsibility for control and operation of INSAT/GSAT/METSAT satellites;

l) Indian Institute of Remote Sensing (IIRS), Dehradun is a premier training and educational institute set up for developing trained professionals in the field of Remote Sensing, Geo-informatics and GPS Technology for Natural Resources, Environmental and Disaster Management.

m) ISRO Inertial Systems Unit (IISU), Thiruvananthapuram, carries out research and development in the area of inertial systems for satellites and launch vehicles;

4. Organizations receiving Grants-in-aid:

a) Physical Research Laboratory (PRL), Ahmedabad carries out research in space sciences.

b) The National Atmospheric Research Laboratory (NARL) set up at Gadanki near Tirupati, conducts atmospheric research.

c) The North-Eastern Space Applications Centre (NE-SAC) provides space technology inputs for developmental activities in the North-Eastern Region.

d) The Indian Institute of Space Science and Technology (IIST) has been established with the objective of creating quality human resources tuned to suit the requirements of state-of-art space research programme. The Institute offers graduate, post-graduate and doctoral programmes in the area of space science, technology and applications.

5. Government Companies under DOS:

a) The Antrix Corporation Limited, Bengaluru, established in 1992, is a wholly owned Government Company for marketing space products and services.

b) The New Space India Limited (NSIL), Bengaluru, is another commercial arm of Indian Space Research Organization, with the primary objective of enabling Indian industries to scale up high-technology manufacturing and production base for Indian space programme. NSIL was established in 2019 as a wholly owned Government Undertaking/Central Public Sector Enterprise, under the administrative control of Department of Space.

6. Indian National Space Promotion and Authorization Center (INSPACe)

As part of the space reforms, an independent nodal agency under DOS – the Indian National Space Promotion and Authorization Centre (IN-SPACe) was formed to promote, handhold, regulate and authorise the activities of private enterprises and start-ups. IN-SPACe operates from its headquarters at Ahmedabad and field offices in Bengaluru and Mumbai.

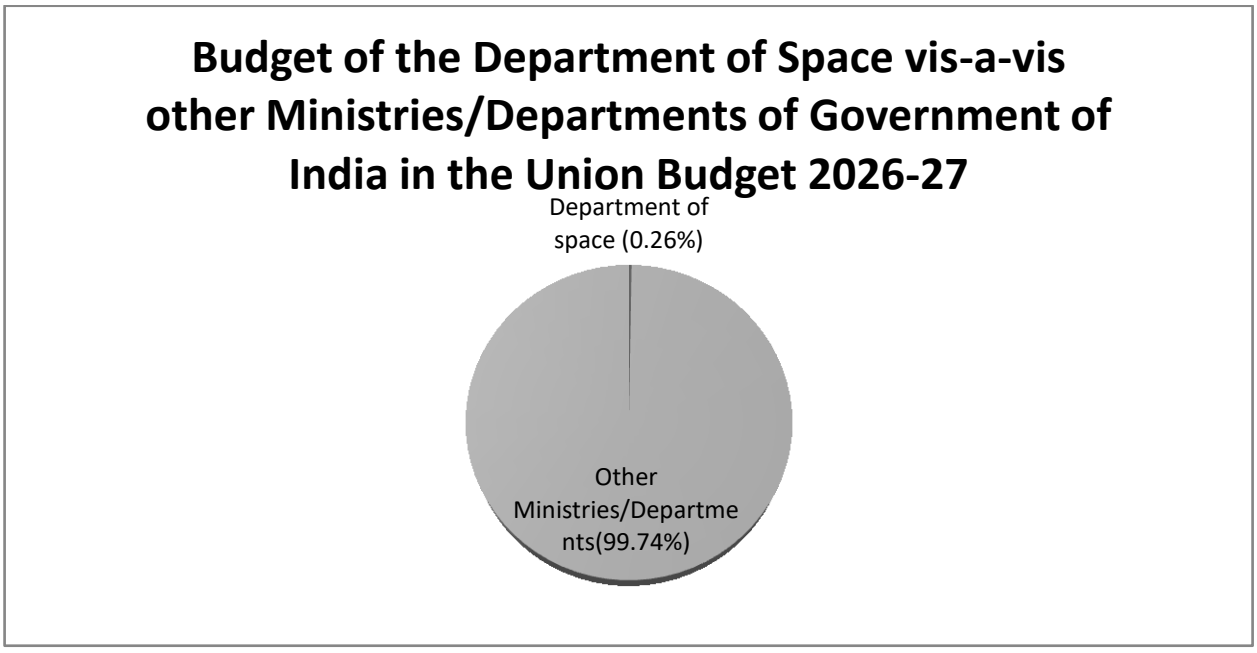
CONSIDERATION OF DEMANDS FOR GRANTS OF THE DEPARTMENT OF SPACE

7. The Department related Parliamentary Standing Committee on Science and Technology, Environment, Forests and Climate Change considered the Demands for Grants (2026-27) of the Department of Space during the meeting held on 26th February, 2026.The Demands for Grants (2026-27) of the DOS have been presented to the Parliament under Demand no.95.

BUDGETARY ALLOCATION FOR THE DEPARTMENT OF SPACE IN THE UNION BUDGET 2026-27:

8. The total Union Budget for the financial year 2026-27 is ₹53,47,315 crore. Out of this, an amount of ₹13,705.63 crore has been allocated to the Department of Space. This is about 0.26% of the total Union Budget.

CHART I



9. The Department informed the Committee that it had projected an outlay of ₹15,604.80 crore to the Ministry of Finance during the Pre-Budget Meeting under Demand No.95 for the financial year (2026-27). Against this projection, the Ministry of Finance approved an outlay of ₹13,705.63 crore, which is about 87.82% of the projected amount.

10. The details of the projections made by the Department of Space to the Ministry of Finance for the years 2023–24, 2024–25, 2025–26 and 2026–27 and the outlays provided to the Department at the BE and RE stages, along with the Actuals, are as follows:

TABLE I

Analysis of the Budgetary trends of the Department of Space (2023-24 to 2026-27)

(₹ in Crore)

Item	Projections made to the MoF	BE	RE	Actuals
2023-24	13,145.00	12,543.91	11,070.07	10,726.78
2024-25	13,480.23	13,042.75	11,725.75	11,518.62
2025-26	15,983.37	13,416.20	12,448.60	9,739.72*
2026-27	15,604.80	13,705.63	-	-

*Actuals upto Jan 2026

11. The Committee has inquired how the Department's key schemes and initiatives would be impacted by the substantial shortfall between the budget it had proposed and the allocation made in BE 2026–27. In response, the Department submitted that, in line with the expenditure ceilings communicated by the Ministry of Finance (MoF), it has carefully prioritised its projects and programmes. The Department has ensured adequate funding for all ongoing projects, programmes, and schemes, while rationalising the requirements of newly approved projects to align with the budgetary ceilings for BE 2025–26. The Department further indicated that, based on the progress of various missions, it may seek additional funds from the Ministry of Finance at the Revised Estimates (RE) stage or through supplementary grants, as necessary.

12. The Committee notes that the Department of Space had projected an outlay of ₹15,604.80 crore to the Ministry of Finance under Demand No. 95 for the financial year 2026–27. However, the Ministry of Finance approved an outlay of ₹13,705.63 crore, which is about 87.82% of the projected amount. The Committee is of the view that the pattern and extent of fund utilization during the current financial year significantly influence the allocation made in the subsequent year. A careful examination of the Department's expenditure pattern over the years

indicates that it has not been able to fully utilize the outlays sanctioned to it. For instance, the Department was allocated an outlay of ₹13,416.20 crore at the BE stage in 2025–26, which was subsequently revised downward to ₹12,448.60 crore at the RE stage. Further, the Department has been able to incur an expenditure of only ₹9,739.72 crore up to 31st January, 2026. Slow pace of expenditure appears to have contributed to the reduction in allocation made to the Department in BE 2026–27 vis-à-vis the projected outlay. In view of the above, the Committee urges the Department to take necessary measures to improve the rate of budget utilization and strive to achieve full utilization of the allocated funds in the coming financial year, so as to avoid any reduction in future budgetary allocations.

KEY HIGHLIGHTS OF THE BUDGET OF THE DEPARTMENT OF SPACE 2026-27:

13. The major highlights of the Budget 2026-27 of the Department of Space includes the following:

a) The Budgetary allocation 2026-27 is ~10% increase with respect to the Revised Estimates 2025-26.

b) Major ongoing programmes/projects included in the budget are (i) Gaganyaan including follow-on missions leading to BAS (₹1,200.00 Crore), (ii) establishment of Launch Pad for SSLV (₹200.00 Crore), (iii) Third launch Pad (₹170.00 Crore) and (iv) Development of Next Generation Launch Vehicle (₹120.00 Crore).

c) New Projects/Programmes included in BE 2025-26 are (i) Chandrayaan-4 (₹192.00 Cr), (ii) Chandrayaan-5 - LUPEX (₹59.95Cr) and (iii) Venus Orbiter Mission (₹80.00 Cr).

d) The promotional schemes of Indian National Space Promotion and Authorization Centre (IN-SPACe) including venture capital fund has been allocated an amount of ₹170.52 Crore to promote participation of Non-Government Entities in Space sector.

e) Allocations are also made for realisation of on-going programmes such as PSLV Continuation Programme; GSLV Operational Programme; GSLVMk III Operational Programme; Augmentation of Infrastructure

towards enhancement of launch capacity of LVM3; Augmentation of NavIC capacity; realisation of Earth Observation Satellites;

f) The major technology development initiatives include Vertical Take-off and Vertical Landing (VTVL) technologies, Critical Technologies for Hypersonic Air breathing Vehicle, LOX-LCH4 engine, high thrust EPS, 3.1kN and 1.5kN thrust engines, 18m Unfurlable Antenna, Infrared Detectors and Integrated Detector Cooler Assembly etc.;

g) Budget allocation is also made for major developmental projects including Semi-Cryogenic Engine & Stage Development, Re-entry technologies, etc.;

h) Space based applications included in the budget are Disaster Management Support Services, National Natural Resources Management System, Climate & Atmospheric Programme etc.

New Projects/activities for which budgetary demand is proposed

14. The details of new projects for which budgetary demand is proposed in the year 2026-27 are as follows:

a) Induction of procured Semi-cryogenic engine towards expediting the enhancement of LVM3 launch vehicle payload capability;
b) Space Docking Experiment – 2 (SPADEX-2) Mission.

DETAILED HEAD-WISE ALLOCATION OF BUDGET 2026-27

15. The Budget Estimate 2026-27 allocation of the Department is ₹13,705.63 crore. The 'Revenue' and 'Capital' break-up of the provision for BE 2026 - 27 is as follows:

TABLE II

'Revenue' and 'Capital' break-up of BE 2026 - 27 of Department of Space

(₹in Crore)

	Revenue	**Capital**	**Total**
Budget Estimates 2026-27	7,329.71	6,375.92	**13,705.63**

16. The detailed Head-wise allocation of budget at BE and RE stages and actual utilization during the years 2023-24, 2024-25 and 2025-26 are as follows:

TABLE III

Detailed Head-wise allocation of budget at BE and RE stages to Department of Space and actual utilization during the years 2023-24, 2024-25 and 2025-26

(₹ in crore)

Sl No	Scheme	2023-24			2024-25			2025-26		
		BE	RE	Actuals	BE	RE	Actuals	BE	RE	Actuals*
A.	**Central Sector Schemes**									
1	Space Technology	9,440.66	8,180.01	8,083.43	10,087.52	8,985.59	8,840.69	10,230.21	9,601.98	7,358.50
2	Space Sciences	138.80	139.87	109.51	133.57	127.24	107.92	371.00	184.62	165.08
3	Space Applications	1,558.95	1,526.29	1,475.43	1611.71	1527.98	1,562.92	1,706.79	1,596.27	1,294.69
4	INSAT Satellite Systems	531.00	332.73	234.74	276.00	218.44	176.13	207.00	205.95	143.91
	Subtotal - A	**11,669.41**	**10,178.90**	**9,903.11**	**12,108.80**	**10,859.25**	**10,687.66**	**12,515.00**	**11,588.82**	**8,962.18**
B.	**Other Central Sector Expenditure**									
5	Establishment Expenditure	450.91	453.78	399.18	478.56	416.08	386.22	398.85	386.84	318.13
6	Other Central Sector Expenditure	423.59	437.39	424.49	455.39	450.42	444.74	502.35	472.94	459.41
	Subtotal -B	**874.50**	**891.17**	**823.67**	**901.20**	**866.50**	**830.96**	**901.20**	**859.78**	**777.54**
	Grand Total (A+B)	**12,543.91**	**11,070.06**	**10,726.78**	**13,042.75**	**11,725.75**	**11,518.62**	**13,416.20**	**12,448.60**	**9,739.72**

* As on January 2026

17. The B.E. 2026-27 allocations to the Department of Space across main budget heads are depicted below:

TABLE IV

Detailed Head-wise allocation of budget to Department of Space in BE 2026-27

(₹ in crore)

S.No.	Budget Head	BE 2026-27
	A. Establishment Expenditure	
1	Secretariat	156.25
2	ISRO Head quarters	194.57
3	In-Space	43.00

	Total Establishment Expenditure	393.82
B. Central Sector Schemes/Projects		
4	Space Technology	10397.06
5	Space Applications	1725.06
6	Space Sciences	569.76
7	INSAT Satellite systems	130.93
	Total- Central Sector Schemes/Projects	12822.81
C. Other Central Sector Expenditure		
8	IIST	147.50
9	NE-SAC	45.00
10	NARL	53.00
11	PRL	235.06
12	NSIL	0.01
13	International Cooperation	8.43
	Total- Other Central Sector Expenditure	489.00
Grand Total A+B+C		**13705.63 crore**

a) Under Establishment Expenditure, a provision of ₹393.82 Crore has been allocated in BE 2026-27 towards meeting the establishment expenditure for DOS secretariat, Indian National Space Promotion & Authorization Centre (IN-SPACe) and ISRO Headquarters.

b) Under the **Space Technology** area, a provision of ₹10,397.06 Crore has been allocated in BE 2026-27 which is essentially for i) the major ongoing Launch Vehicle related projects such as GSLV Continuation, GSLV Mk III Continuation, PSLV Continuation, Semi-cryogenic Engine and Stage Developments, RLV-TD Orbital re-entry experiment etc; ii) Undertaking Human space flight programme including follow-on missions leading to Bharatiya Antariksh Station; iii) Development of Next Generation Launch Vehicle; iv) Earth Observation missions such as Resourcesat-3 series, Oceansat-3A, High Resolution Satellite Constellation, G20 Satellite; v) Navigational Satellite Systems; vi) Technology Development Spacecraft - 02 (TDS-02); vii) technology development initiatives, advanced R&D, technical facilities augmentation/ replacement and organization & infrastructure maintenance of related centres/units viz., Vikram Sarabhai Space Centre (VSSC), Liquid Propulsion System Centre (LPSC), Human Space Flight Centre (HSFC), ISRO Propulsion Complex (IPRC), ISRO Inertial Systems Unit (IISU), U R Rao Satellite Centre (URSC), Laboratory for Electro-optics Systems (LEOS), Satish Dhawan Space Centre-SHAR (SDSC-SHAR), ISRO Telemetry Tracking & Command Network (ISTRAC), Master Control Facility (MCF), viii) Major facilities like NETRA, augmentation of infrastructure towards enhancement of launch capacity of LVM3, SSLV

launch pad, third launch pad etc ix) Major works and Housing related activities for various ISRO Centres / Units., x) Induction of procured Semi-cryogenic engine towards expediting the enhancement of LVM3 launch vehicle payload capability, xi) IN-SPACe schemes such as Venture capital fund, common technical facility, technology adoption fund, seed fund scheme etc

c) Under **Space Applications**, a provision of ₹1,725.06 Crore has been allocated in BE 2026-27 which is essentially for undertaking Space Applications Programmes such as National Natural Resources Management System, Disaster Management Support etc. Major application R&Ds, Facility Infrastructure, Operation & Maintenance of related Centres viz., Space Application Centre (SAC), National Remote Sensing Centre (NRSC) and Indian Institute of Remote Sensing (IIRS) are also included under the scheme. Allocation is also earmarked towards inclusion of Advanced Data Processing Unit (presently under NTRO) under the Department.

d) Under the **Space sciences**, a provision of ₹569.76 Crore has been allocated in BE 2026-27 which is essentially for Chandrayaan-4, Chandrayaan-5, Venus Orbiter Mission, TRISHNA, RESPOND, Space science programmes such as Climate and Atmospheric programme, Space science payload / sensor development etc.

e) The major projects/missions under **INSAT Satellite System** essentially include IDRSS, Technology Demonstration Spacecraft (TDS-01) and service charges for leasing of transponders. A provision of ₹130.93 crore has been allocated in BE 2026-27 towards this programme.

f) An amount of ₹480.56 crore has been allocated under **Assistance to Autonomous Bodies** in BE 2026-27 towards Grant-in-Aid support to four autonomous Bodies under Department of Space.

g) An amount of ₹8.43 crore has been allocated in BE 2026-27 under **International Co-operation** related to space activities.

h) An amount of ₹0.01 crore has been allocated in BE 2026-27 for M/s **NewSpace India Ltd (NSIL)**.

CHART II

Graphical depiction of the budgetary allocation (BE 2026-27) of Department of Space across main budget heads

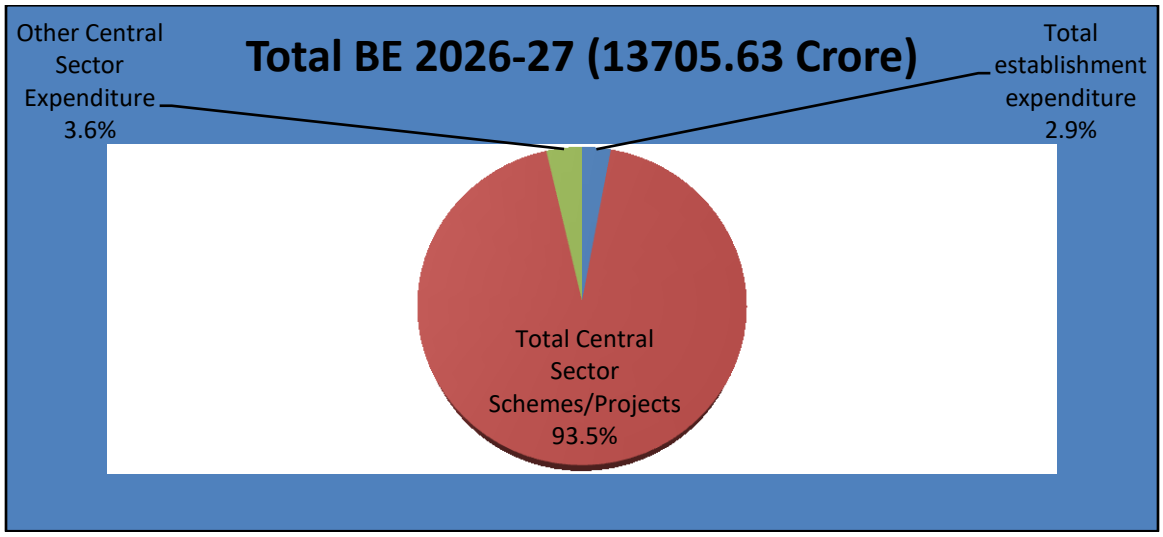
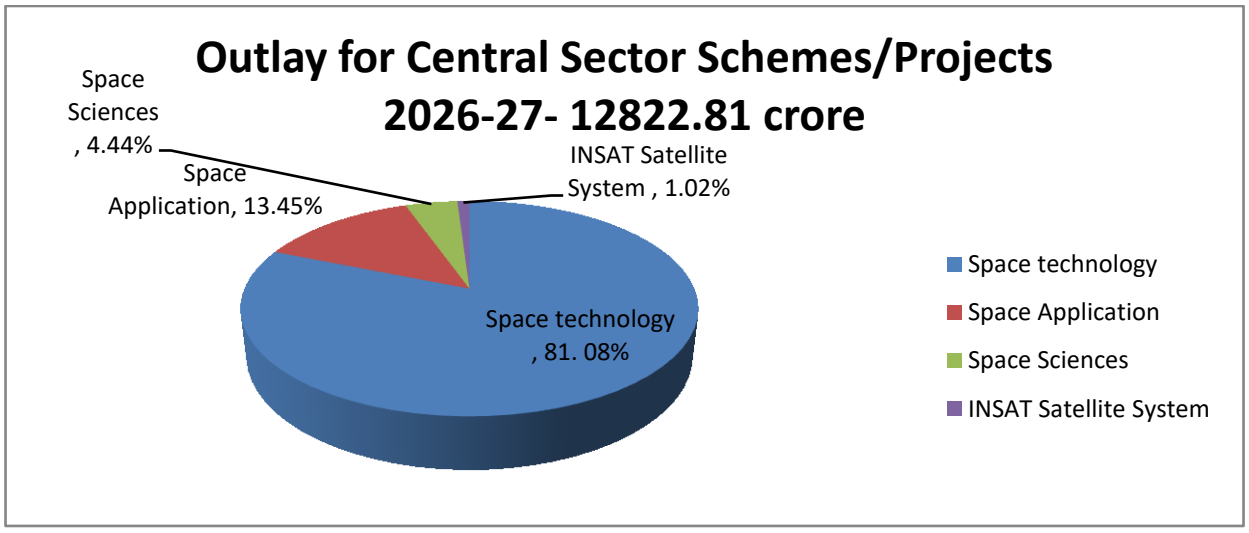


CHART III

Break up of outlay allocated for Central Sector Schemes/Projects in BE 2026-27

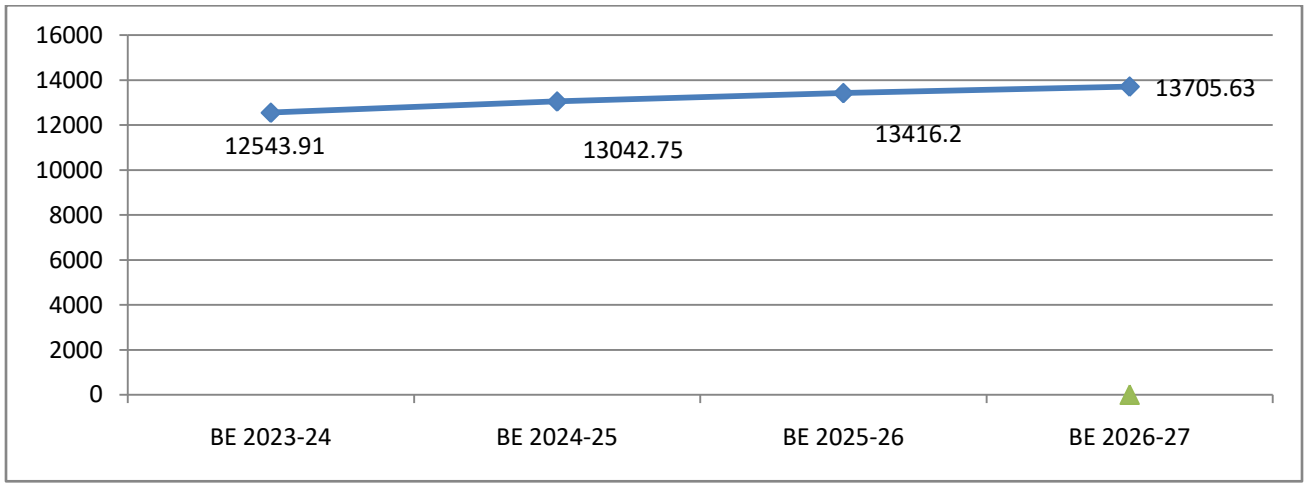


18. The following graphical depictions show the trend in BE allocations from 2023-24 to 2026-27:

CHART IV

Trend in overall BE allocations from 2023-24 to 2026-27

(₹in Crore)



19. The Committee observes that the outlay allocated for ISRO Headquarters and IN-SPACe under the 'Establishment Expenditure' head, INSAT satellite systems under the 'Central Sector Schemes' head, and IIST, NESAC, NARL, and

PRL under the 'Other Central Sector Expenditure' head is lower compared to the allocations made in BE 2025–26. The Committee further observes that the allocations for IN-SPACe and INSAT systems in BE 2026–27 are, in fact, lower than the levels provided in RE 2025–26. Given the significant role of the Department of Space (DoS) in advancing the country's space capabilities and supporting national development, the Committee underscores the need to ensure adequate financial support so that these institutions can effectively discharge their mandates. The Committee particularly emphasizes the importance of the INSAT satellite systems in providing critical communication, broadcasting, meteorological, and disaster management services. Any shortage of funds may adversely affect the maintenance, upgradation, and expansion of these vital systems. In view of the above, the Committee recommends that additional funds may be provided to the Department of Space at the Revised Estimates (RE) stage to ensure that the concerned institutions and programmes are able to function efficiently and fulfill their strategic and developmental objectives.

ASSESSMENT OF THE PATTERN OF BUDGET UTILIZATION BY THE DEPARTMENT OF SPACE

20. The details of outlay utilized by the Department against the allocations made to it at BE and RE stages during 2023-24, 2024-25 and 2025-26 are as follows:

TABLE V

Pattern of Budget utilization by the Department of Space during 2023-24, 2024-25 and 2025-26

(₹in Crore)

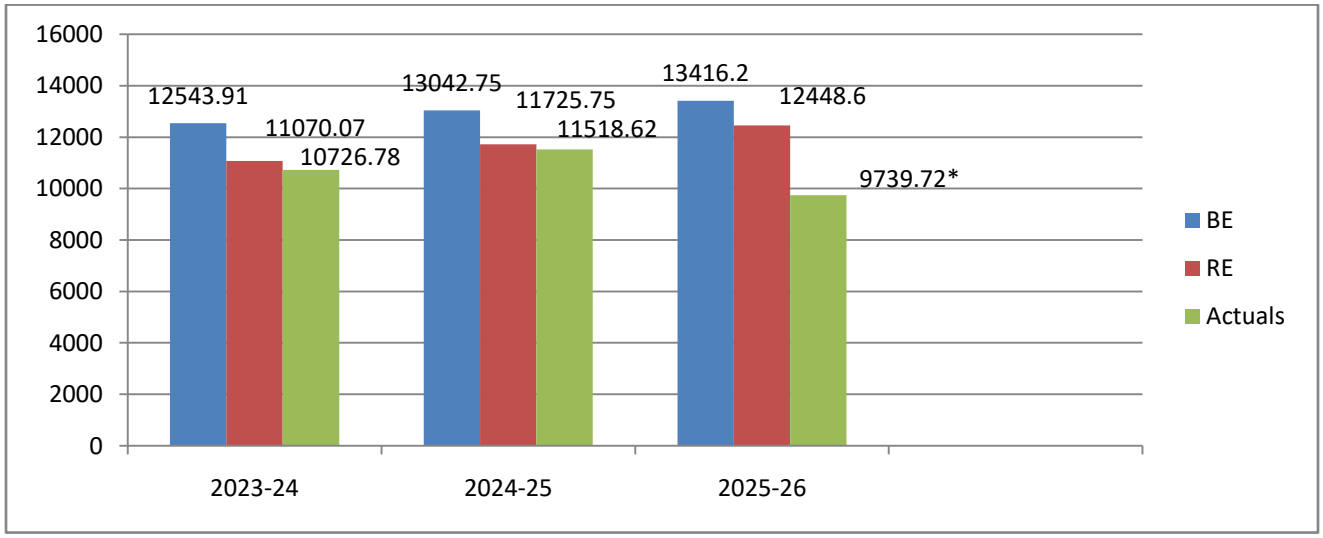
Item	BE	RE	Actuals	Percentage of Budget utilized
2023-24	12,543.91	11,070.07	10,726.78	96.89%
2024-25	13,042.75	11,725.75	11,518.62	98.23%
2025-26	13,416.20	12,448.60	9,739.72*	78.23%

*Actuals upto January 2026.

CHART V

Graphical depiction of the pattern of Budget utilization by the Department of Space during 2023-24, 2024-25 and 2025-26

(₹in Crore)



*Actuals upto January 2026.

TABLE VI

Detailed Head wise utilization of outlay by the Department of Space during 2025-56

(Figures in crore)

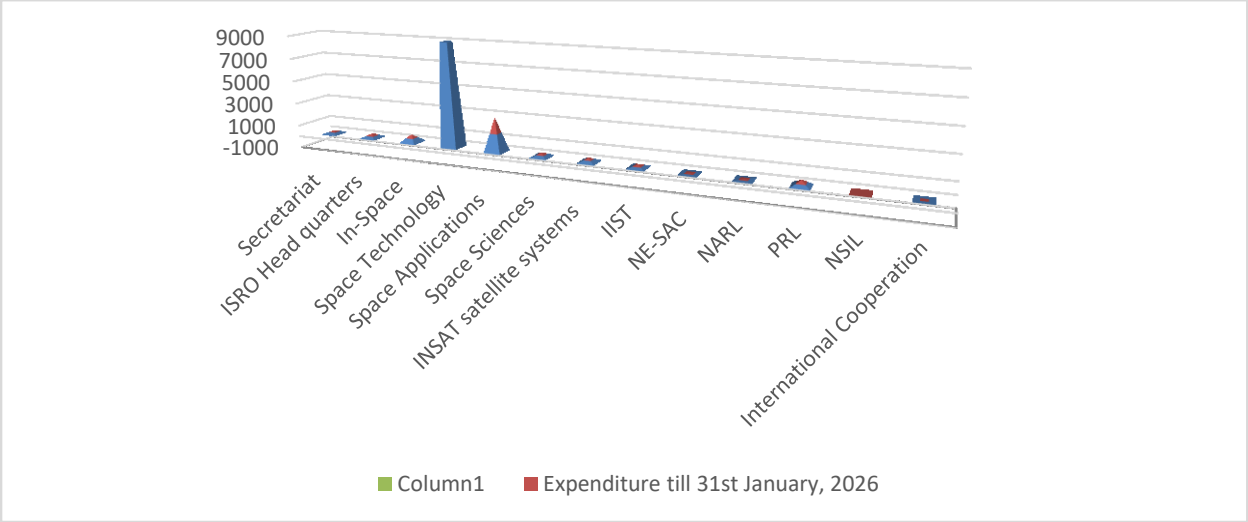
S.No.	Budget Head	BE 2025-26	RE 2025-26	Provisional Expenditure (till 31st Jan, 2026)	Percentage of Budget utilized till 31st Jan, 2026	BE 2026-27
	A. Establishment Expenditure					
1	Secretariat	113.80	153.89	106.59	69.26%	156.25
2	ISRO Head quarters	215.05	187.95	179.62	95.56 %	194.57
3	In-Space	70.00	45.00	31.92	70.93%	43.00
	Total Establishment Expenditure	398.85	386.84	318.13	82.23%	393.82
	B. Central Sector Schemes/Projects					
4	Space Technology	10230.21	9601.98	7358.50	76.63%	10397.06
5	Space Applications	1706.79	1596.27	1294.69	81.10%	1725.06
6	Space Sciences	371.00	184.62	165.08	89.41%	569.76

7	INSAT Satellite systems	207.00	205.95	143.91	69.87%	130.93
	Total- Central Sector Schemes/Projects	12515.00	11588.82	8962.18	77.33%	12822.81
C. Other Central Sector Expenditure						
8	IIST	150.00	144.60	137.80	95.29%	147.50
9	NE-SAC	50.00	40.00	37.62	94.05%	45.00
10	NARL	55.34	49.80	47.70	95.78%	53.00
11	PRL	240.00	233.54	233.24	99.87%	235.06
12	NSIL	0.01	0.00	0.00	-	0.01
13	International Cooperation	7.00	5.00	3.05	61%	8.43
	Total- Other Central Sector Expenditure	502.35	472.94	459.41	97.13%	489.00

CHART VI

Graphical depiction of the pattern of Budget utilization by the Department of Space during 2025-26 (till 31 Jan, 2026)

(₹in Crore)



21. The Committee observes that the Department of Space has utilized 78.23 per cent of the outlay allocated at the Revised Estimates (RE) stage for 2025–26 as on

31st January 2026. The Committee notes that the Department of Space has historically maintained a commendable record of fund utilization, generally in the range of 96–98 per cent over the years. The Committee is hopeful that the Department of Space will ensure full utilization of the funds allocated to it in the ongoing financial year as well.

ASSESSMENT OF THE PATTERN OF BUDGET UTILIZATION BY INSTITUTIONS UNDER THE DEPARTMENT OF SPACE

22. The details of outlay utilized by the institutions under the Department of Space against the allocations made to them at BE and RE stages during 2023-24, 2024-25 and 2025-26 are as follows:

TABLE VII

Pattern of Budget utilization by the institutions under the Department of Space during 2023-24, 2024-25 and 2025-26

(Figures in crore)

Institution	BE 2024-25	RE 2024-25	Actual 2024-25	BE 2025-26	RE 2025-26	Provisional expenditure incurred till Jan 31, 2026	Percentage of budget utilized till Jan 31, 2026	BE 2026-27
ISRO	221.07	226.08	214.52	215.05	187.95	179.62	95.56%	194.57
HSFC	91.38	91.54	82.90	122.60	95.63	69.40	72.57%	120.00
IIRS	67.64	57.20	56.41	65.13	67.49	50.11	74.24%	74.79
IISU	70.41	52.58	52.09	65.00	54.58	42.97	78.72%	65.00
IPRC	494.78	455.56	432.22	530.00	483.24	364.84	75.49%	550.00
ISTRAC	394.07	379.35	352.27	450.00	466.58	335.41	71.88%	520.00
LEOS	98.84	101.98	98.47	110.00	118.89	88.52	74.45%	133.22
LPSC	623.29	586.17	571.33	670.00	663.34	538.99	81.25%	700.33
MCF	198.25	203.86	188.52	210.00	184.35	136.71	74.15%	200.00
NRSC	550.00	469.00	460.40	492.00	482.78	394.38	81.68%	527.00
SDSC SHAR	993.87	887.22	937.97	950.00	932.06	794.31	85.22%	1045.34
SAC	962.32	979.47	1037.91	1000.66	1012.35	828.50	81.83%	1080.28
URSC	965.54	934.07	954.71	990.00	991.32	866.73	87.43%	1067.06
VSSC	1876.06	1873.52	1876.01	2004.04	1908.93	1670.50	87.50%	2052.47

Institution	BE 2024-25	RE 2024-25	Actual 2024-25	BE 2025-26	RE 2025-26	Provisional expenditure incurred till Jan 31, 2026	Percentage of budget utilized till Jan 31, 2026	BE 2026-27
IN-SPACe	96.00	58.00	41.36	70.00	45.00	31.92	70.93%	43.00
Antrix Corporation Limited	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
NSIL	1.00	0.00	0.00	0.01	0.00	0.00	0	0.01
IIST	129.50	130.00	128.29	150.00	144.60	137.80	95.29%	147.50
NARL	52.00	51.40	45.63	55.34	49.80	47.70	95.78%	53.00
NESAC	51.49	41.94	38.21	50.00	40.00	37.62	94.05%	45.00
PRL	217.00	220.08	229.08	240.00	233.54	233.24	99.87%	235.06

23. The Committee underscores that fiscal discipline and prudent financial management are essential for ensuring that public funds are utilized efficiently, transparently, and in a manner that delivers the intended outcomes. Proper planning and timely expenditure not only facilitate smooth implementation of programmes and projects but also prevent delays, cost escalations, and bunching of expenditure towards the end of the financial year. The Committee notes with concern that institutions such as HSFC, IIRS, ISTRAC, LEOS, MCF, and IN-SPACe have not been able to utilize 75 per cent of the funds allocated to them within the stipulated period. Such trends, if not addressed in time, may affect the pace of programme implementation and the effective delivery of institutional mandates. The Committee is of the view that optimal utilization of funds is as important as the allocation of funds itself. Accordingly, the Committee recommends that the Department of Space strengthen its monitoring mechanisms and closely review the spending patterns of these institutions on a quarterly basis. The Department should ensure timely and proportionate disbursement of funds, identify the reasons for slower expenditure, and take corrective measures to improve the pace and efficiency of utilization.

VACANCIES

24. The Committee sought information regarding the sanctioned strength, in-position strength and vacancies in various institutions functioning under the Department of Space. In response, the following data was furnished by the Department:

TABLE VIII

Details of Staff strength and vacancies in the Department of Space and its institutions

Centre/ Unit/AB	Sanctioned Strength			In-position strength			Vacancies		
	Group A	Group B	Group C	Group A	Group B	Group C	Group A	Group B	Group C
ISRO HQ	129	102	90	125	95	67	4	7	23
DOS	98	64	90	80	40	30	18	24	60
HSFC	261	70	103	187	44	31	74	26	72
IIST	133	21	0	127	10	0	6	11	0
IIRS	75	16	22	75	16	7	0	0	15
IPRC	458	190	136	393	177	110	65	13	26
ISTRAC	310	86	115	305	74	48	5	12	67
LPSC	899	326	246	819	316	173	80	10	73
MCF	182	75	95	164	38	62	18	37	33
NARL	52	13	15	52	6	9	0	7	6
NESAC	46	12	1	45	8	1	1	4	0
NRSC	653	213	153	511	144	133	142	69	20
PRL	259	81	65	214	50	23	45	31	42
SAC	1364	455	456	1265	396	162	99	59	294
SDSC	1054	901	591	976	791	376	78	110	215
URSC	1741	601	490	1607	554	319	134	47	171
VSSC	2904	1339	818	2694	1339	564	210	0	254
Total	**10618**	**4565**	**3486**	**9639**	**4098**	**2115**	**979**	**467**	**1371**

25. The Committee subsequently inquired the Department regarding the reasons for the significant shortage of human resources and the measures taken to address the issue. In response, the Department submitted that the accumulation of vacancies in the Department of Space (DoS) is largely the result of cascading effects since 2020–21 arising from COVID-19 restrictions, the implementation of sectoral reforms, and the adoption of more stringent and foolproof recruitment procedures. According to the Department, recruitment processes could only be re-initiated after October 2023, which

created a substantial gap in recruitment activities for nearly two to three years. Vacancies arising from attrition during this period further added to the backlog.

26. The Department informed that it has taken steps to address these challenges and that recruitment activities are currently being pursued with renewed momentum. Efforts are underway to fill vacant posts by December 2026. Recruitment processes have already been initiated for 1,449 posts, which are expected to be completed by October 2026. Recruitment action for the remaining 933 posts is being initiated and is scheduled to be completed by December 2026. The balance vacancies include erstwhile Group 'D' posts in the S&T category (80 posts) and the administrative category (355 posts). Following the approval of the Second Cadre Review of administrative posts, the Department is in the process of implementing the revised structure, and these posts will be filled accordingly. The Department has further informed that appropriate mechanisms have been put in place for the periodic review of recruitment actions, both at the central level and through the participating Centres/Units. With the completion of the implementation of the Second Cadre Review for administrative categories, expected by March 2026, the Department will be in a position to take necessary action for filling up promotion and induction posts, which is expected to significantly reduce the existing vacancy levels.

27. The Department has also undertaken several advance measures to streamline and expedite the recruitment process, including: (i) Anticipating vacancies likely to arise during the ensuing one-year period and initiating recruitment action in advance; (ii) Adopting GATE score-based recruitment to reduce the lead time involved in the recruitment process; and (iii) Establishing a centralised rate contract with external agencies for conducting Computer-Based Tests (CBT) for various posts through both centralised and decentralised modes, thereby significantly reducing the time required for conducting and evaluating recruitment examinations compared to paper-based tests.

28. The Committee notes that the Department of Space has been facing a significant shortage of human resources owing to the accumulation of vacancies from 2020–21 onwards. The Committee recognizes that human resources constitute a critical component in the successful planning, execution, and management of complex space missions and programmes undertaken by the Department. Adequate availability of skilled scientific, technical, and administrative personnel is therefore essential for sustaining the momentum of the

national space programme and achieving the strategic objectives of the Department of Space. While taking cognizance of the measures initiated by the Department to address the issue, including the re-initiation of recruitment processes, adoption of GATE score-based recruitment, conduct of Computer-Based Tests, and establishment of mechanisms for periodic review of recruitment actions, the Committee notes the Department's commitment to fill 2,383 vacant posts by December 2026. The Committee recommends that the Department of Space make concerted efforts to adhere to the proposed timelines and ensure that the identified vacancies are filled within the stipulated period. The Committee further urges the Department to take mission-mode measures to address the backlog of vacancies, including the remaining posts arising from cadre restructuring and other categories to ensure that the Department and its Centres/Units are adequately staffed to effectively discharge their responsibilities and support the growing demands of India's space sector.

SPACE VISION 2047

Gaganyaan

29. The Committee sought information regarding the approval, funding, and progress of the Gaganyaan Mission. The Department of Space (DoS) replied that the Gaganyaan programme was initially approved by the Government of India in January 2019 with the objective of carrying out three missions-two uncrewed missions followed by one crewed mission. Subsequently, in October 2024, the scope of the programme was expanded from three to eight missions. The revised mission profile now includes three uncrewed missions (G1, G2, and G3), two crewed missions (H1 and H2), a docking mission to an existing space station (G4), the launch of BAS-01, and a docking mission to BAS-01 (G5).The total approved cost of the revised Gaganyaan programme is ₹20,193.00 crore.

30. The Department also provided the year wise details of budget allocation and expenditure incurred in respect of Gaganyaan mission, since approval and till date which are summarized below:

(₹ in crore)

Financial Year	BE	RE	Actual Exp.
2018-19	2.50	2.59	2.57
2019-20	1000.10	1000.10	1007.24
2020-21	1200.00	710.00	709.80
2021-22	1900.00	1100.00	970.17
2022-23	2000.00	950.00	876.94
2023-24	1180.50	1090.00	1039.67
2024-25	1200.00	847.35	826.96
2025-26	1200.00	950.00	798.38*

(* As on January 31, 2026)

31. Further, the Department has provided the following information regarding the key activities undertaken under the Gaganyaan Mission so far:

A. New Developments

- **Human Rated Launch Vehicle (HLVM3):** The development phase has been completed and the required ground testing has been successfully carried out.
- **Orbital Module:** The propulsion systems have been developed and tested, and engineering models of the Environmental Control and Life Support System (ECLSS) have been realized.
- **Crew Escape System (CES):** Five different types of motors have been developed and successfully subjected to static testing.
- **Infrastructure Development:** Several facilities have been established, including the Orbital Module Preparation Facility, Gaganyaan Control Centre, Gaganyaan Control Facility, Crew Training Facility, and modifications to the Second Launch Pad.
- **Precursor Missions:** The TV-D1 and IADT-01 missions have been successfully completed. Environmental testing of the integrated Crew Module for TV-D2 has also been completed.
- **Flight Operations and Communication Network:** Ground tracking network facilities, terrestrial communication links, and IDRSS-1 feeder stations have been

set up. Memoranda of Understanding (MoUs) have also been signed with international ground stations for additional support.

- **Crew Recovery Operations:** Recovery assets have been identified and finalized, and a comprehensive recovery plan has been prepared.

B. First Uncrewed Mission (G1)

- All stages of the HLVM3 launch vehicle-HS200, L110, and C32-as well as the Crew Escape System motors, are ready. The systems for both the Crew Module and Service Module have been realized. Assembly, integration, and testing of these modules have been completed, and integrated simulations are currently underway.

32. When the Committee raised concerns regarding the slow pace of expenditure, under-utilization of funds, and the consequent reduction in allocations at the Revised Estimates (RE) stage, the Department explained that many of the systems under the Gaganyaan programme are being developed for the first time by ISRO and are technologically complex. Since the mission involves human spaceflight, ensuring crew safety is of paramount importance, which has led to longer development periods than initially anticipated. The Department further stated that several new technologies must undergo extensive testing to comply with human-rating standards. During detailed engineering and review stages, additional hardware and testing requirements were identified. Moreover, observations made during the development phase required design modifications, followed by re-testing and re-validation. These factors have resulted in adjustments to the mission timelines and consequently led to lower expenditure during the period.

BHARATIYA ANTARIKSH STATION (BAS)

33. The Committee sought information regarding the approval, funding, and progress made in respect of BAS. The Department, in its written reply submitted that Bharatiya Antariksh Station (BAS) is India's first modular space station. It is intended as a platform for human habitation, scientific research, technology demonstrations and microgravity studies in Low Earth Orbit (LEO). A five-module configuration has been finalized for BAS viz. BAS-01, BAS-02, BAS-03, BAS-04 and BAS-05. Currently, the development of 1st module has been commenced. These five modules are referred as Base module, Core module, Science module, Lab module and Common Berthing module (CBM) respectively. The first module (BAS-01) is targeted for launch by 2028 and a fully operational station is expected by 2035.

34. The Committee was also informed that the revised scope of Gaganyaan programme approved in October 2024 includes the development & launch of 1st module of Bharatiya Antariksh Station (BAS-01). Towards this, a funding provision of ₹1763 Cr has been made under the overall approved budget of ₹20193 Crore for Gaganyaan Follow-on Missions leading to Precursor for Bharatiya Antariksh Station. Approved budget for 1st module of BAS is made available from 2025-26 onwards. The Department further informed that during the year 2025-26, major efforts were made towards finalization of configuration & accommodation studies for various systems, overall system engineering and detailed engineering of various identified subsystems and that based on the detailed design, hardware specification & requirements are being finalized.

Next Generation Launch Vehicle (NGLV)

35. The Committee was given to understand that NGLV is a three-stage partially reusable launch vehicle with two variants wherein the first stage has been configured for recovery through vertical landing and reusability. The maximum payload capability of the vehicle is 30t to LEO & 12t to GTO in expendable mode and 14t to LEO & 5.3t to GTO in reusable mode. Both the variants of NGLV have three stages, however solid boosters are included as strap-ons in the heavy lift variant of NGLV. This launch vehicle integrates both the new LOX-Methane system and the proven LOX-LH2 cryogenic propulsion system. The first and second stages are based on a common LOX-Methane Engine (LME-1100) having a nominal thrust of 1100kN. The first stage is configured with a cluster of 9 Engines and the second stage is configured with a cluster of 2 Engines. The third stage is an uprated version of the existing Cryogenic stage developed for LVM3 with a propellant loading of 32t based on LOX-LH2 propellant with 22t thrust level.

36. Then, the Committee sought information regarding the approval, funding, proposed timeline and progress made in realization of NGLV. The Committee further enquired as to how NGLV is different from the existing launch vehicles i.e. PSLV, GSLV, SSLV and LVM3. In response, the Department submitted that India has achieved self-reliance in space transportation systems to launch satellites up to 10t to Low Earth Orbit (LEO) and 4t to Geo-Synchronous Transfer Orbit (GTO) through the currently operational PSLV, GSLV, LVM3 and SSLV launch vehicles. These launch vehicles have enabled independent space access to satellites for earth observation, communication, navigation and space exploration. ISRO has also successfully mastered a range of propulsion systems technologies such as solid propulsion, earth storable

propulsion and cryogenic propulsion systems through these launch vehicle programmes. NGLV differs from the existing Launch Vehicles in the following respects:

a) Nearly 3 times the maximum payload capability of the current LVM3 vehicle
b) LOX-Methane Propulsion system for the first and second stages.
c) Reusable booster stage
d) Booster stage with multiple engines 9 (no.). LVM3 core liquid stage has only two engines.
e) Higher vehicle dimensions & lift-off mass w.r.t the current operational vehicles
f) Larger diameter structures and propellant tanks
g) Horizontal integration of vehicle stages

37. The Department has also informed that NGLV Project was approved by Union Cabinet in 2024. The overall project duration is 96 months from the date of approval of the Project which encompasses facility commissioning, systems development, realisation of subsystems for developmental flights, and launch of three developmental flights (D1, D2 & D3). The first NGLV developmental test flight is targeted within 84 months from the date of approval and the other two development flights are planned to be completed within a year. The Department further informed that in the financial year 2024–25, no provision was made at the Budget Estimates (BE) stage; however, at the Revised Estimates (RE) stage an allocation of ₹3.00 crore was made, against which an actual expenditure of ₹0.85 crore was incurred. In 2025–26, an amount of ₹158.00 crore was provided at the BE stage, which was later revised to ₹39.76 crore at the RE stage. Against this, an expenditure of ₹7.93 crore has been incurred as on 31st January 2026.

38. The Committee notes that under India's Space Vision 2047, key programmes such as the Gaganyaan Mission, Bharatiya Antariksh Station (BAS) and the Next Generation Launch Vehicle (NGLV) represent major milestones for advancing India's capabilities in human spaceflight, space infrastructure and next-generation launch systems. These initiatives are critical for strengthening India's technological self-reliance, expanding opportunities for scientific research in microgravity, and enhancing the country's position as a leading global space power. The Committee notes the reasons advanced by the Department for slow utilization of funds for the Gaganyaan mission and hopes that the Department will

be able to overcome these obstacles without compromising the crew safety. The Committee hopes that the relatively slow pace of expenditure will not adversely impact the timely progress of these strategically important missions. The Committee, therefore, recommends the Department of Space to ensure optimal utilization of funds and make concerted efforts to adhere to the proposed timelines so that these missions are implemented without delays and the objectives of India's Space Vision 2047 are achieved in a timely and efficient manner.

LUNAR AND INTER PLANETARY MISSIONS

Lunar Missions

39. The Committee sought details on the major achievements of the lunar missions undertaken by ISRO in the past, as well as the objectives and proposed timelines of future lunar missions.In response, the Department submitted that three Chandrayaan missions have been undertaken so far and that two more missions are planned in the near future. The major achievements and learnings from the first three missions are as follows:

- Chandrayaan-1(2008-2009): This mission fundamentally changed humankind's understanding of the Moon by discovering hydroxyl molecules and water vapour on its surface and exosphere respectively, proving the Moon was not "bone-dry". The mission provided a new perspective on the interaction between the solar wind and the Moon's surface (regolith). It also provided evidence that the Moon was volcanically active much more recently than previously believed.
- Chandrayaan-2 (2019-Ongoing): While the lander did not succeed, the orbiter remains highly productive scientifically, providing the sharpest images (resolution of ~ 32 cm) ever taken from a lunar orbit. It gave the first definitive proof of water-ice in the polar regions and created detailed global maps of elements like Magnesium, Aluminum, and Silicon.
- Chandrayaan-3 (2023): This mission made history as the first to have successfully landed near the Moon's Southern polar region. It provided "in-situ" (on-site) proof of the Lunar Magma Ocean hypothesis, suggesting the Moon was once covered in molten magma. It also made the first-ever detection of Sulfur and other trace elements directly on the lunar surface and recorded lunar ground vibrations (moonquakes) for the first time since the Apollo era.

Chandrayaan-4

40. The Department has informed the Committee that the proposal to launch Chandrayaan-4 was approved by the Union Cabinet in September 2024. The proposed timeline for its launch is October 2027. The Committee was also informed that the Chandrayaan-4 mission intends to achieve the following specific goals:

- Lunar Sample Return: The primary goal is to safely bring lunar soil (regolith) back to Earth from the Southern polar region for high-end scientific analysis. Currently there is no lunar sample brought back from the polar regions of the Moon. India will be the first country to accomplish this.
- Technological Demonstration: It aims to develop and prove critical new technologies, including automated sampling and drilling, launching a vehicle from the Moon's surface, and docking two spacecraft modules in lunar orbit.
- Preparations towards India's Human-landing on Moon: By mastering the ability to return from the Moon to Earth, this mission serves as a foundation for India's goal to land astronauts on the Moon by 2040.
- Scientific Analysis: On Earth, scientists will study these diverse samples to better understand the origin and formative history of the Earth-Moon system.

Chandrayaan-5

41. As regards the Chandrayaan-5 mission, the Committee was informed that Chandrayaan-5 project is a collaboration mission between ISRO and Japan Aerospace Exploration Agency (JAXA) aimed to land at the Lunar south pole region to obtain data regarding water quantity, obtain data to understand water accumulation mechanism and obtain data on the surface composition at Lunar south pole region. The Spacecraft comprises of a (i) Lunar Lander designed, developed and budgeted by ISRO and (ii) Rover designed developed and budgeted by JAXA. The integrated spacecraft will be launched by JAXA, Japan using JAXA's H3-24L launch vehicle at their cost basis as part of collaboration. The proposed timeline for launch is September 2028.

42. The Committee further sought information from the Department regarding the total funds required for each of the two missions as well as the overall budgetary allocation approved, and the year-wise details of funds released and expenditure incurred to date. In response, the Department submitted that the approved project cost of Chandrayaan-4 and Chandrayaan-5 missions is ₹2,104.06 Crores and ₹981.99 Crores respectively. As regards the details of budget allocated and expenditure incurred on these missions till date, the Department furnished the following data:

> The year wise details of budget allocated and expenditure incurred in respect of Chandrayaan-4 mission since approval and till date is summarized below:

(₹ in crores)

Financial Year	BE	RE	Actual Exp.
2025-26	150.00	21.00	34.60*

(* As on January 31, 2026)

The year wise details of budget allocated and expenditure incurred in respect of Chandrayaan-5 mission since approval and till date is as summarized below:

(₹ in crores)

Financial Year	BE	RE	Actual Exp.
2025-26	2.00	14.00	0.58*

(* As on January 31, 2026)

43. With reference to the Chandrayaan-4 Mission, the Committee desired to know the reasons for (i) the underutilization of funds at the BE stage and (ii) the actual expenditure exceeding the revised allocation. In response, the Department submitted that the development of new scientific missions such as Chandrayaan-4 is an iterative process and is constrained by several technical and operational factors. These include limitations relating to launch mass capacity as well as the availability of qualified vendors capable of supporting the realization of mission hardware. Such factors often influence the pace of development and the pattern of expenditure during the course of mission implementation. The Department further stated that the downward revision of the allocation from ₹150 crore at the Budget Estimate (BE) stage for 2025–26 to ₹21 crore at the Revised Estimate (RE) stage was primarily due to delays in the finalization of mission design and the availability of long-lead items required for hardware realization. These issues affected the planned schedule for procurement and production of certain mission components.

44. It was also informed that the end-to-end realization of mechanism elements through industry partners, as well as the procurement of Electrical, Electronic and Electromechanical (EEE) components and propulsion elements for the spacecraft, originally envisaged during 2025–26 has spilled over to the next financial year. Similarly, procurement of raw materials for the launch vehicle had been planned during the year; however, due to a change in the launch vehicle configuration to incorporate a semi-cryogenic engine, certain procurements were deferred, resulting in underutilization of funds.

45. At the same time, the Department stated that a partial shipment of M250 rings for the S200 motors (raw material for the launch vehicle) was received during the year,

which led to higher expenditure in comparison with the Revised Estimates. Nevertheless, the Department clarified that the total expenditure incurred does not exceed the original Budget Estimate allocation for the project.

Venus Orbiter mission

46. The Committee inquired the Department about the Venus Orbiter Mission, the specific scientific and technological objectives it seeks to achieve, the proposed timeline for its launch and and how the mission differs, in terms of goals, capabilities and objectives, from other Venus-related missions undertaken by international space agencies. The Department submitted that the Venus Orbiter Mission is an orbiter mission to the planet Venus, aimed at improving scientific understanding of the origin and evolutionary processes of Venus. The mission also seeks to study the causative mechanisms responsible for the super-rotation of the Venusian atmosphere, the chemistry of its clouds, the characteristics of the Venusian ionosphere, and the interaction between the solar wind and the planetary environment, using improved observational techniques and higher-resolution instruments.

47. The Department further stated that the mission will pursue several specific scientific and technological objectives. These include high-resolution mapping of the Venusian surface; determination of the structure and stratigraphy of surface and subsurface features, including volcanic hot spots; and detailed studies of the structure and composition of the Venusian atmosphere. The mission will also examine cloud chemistry, detect lightning and airglow phenomena, investigate the mechanisms responsible for the super-rotation of the atmosphere, and study the Venusian ionosphere along with solar wind–induced processes.

48. According to the Department, the renewed global interest in the exploration of Venus presents a significant opportunity for India's scientific and technological community. The mission is expected to address several outstanding scientific questions and generate important outcomes, some of which may represent global firsts, such as higher-resolution surface topography, characterization of dust in the Venusian atmosphere, measurement of the solar X-ray spectrum near Venus, and profiling of subsurface features. The Department further noted that many earlier missions to Venus had limited and narrow spatial coverage, focusing mainly on the south polar region or equatorial belt. As a result, it has been difficult to construct comprehensive global maps of several phenomena such as atmospheric winds, waves and chemical abundances. The proposed Indian mission is expected to provide more uniform global coverage of Venus,

thereby generating a unique dataset that will be valuable for future scientific studies and missions.

49. The Committee further enquired about the approval and timeline of the Venus Orbiter Mission. Specifically, the Committee sought information on when the proposal for launching the mission was approved by the Union Cabinet, the proposed timeline for its launch, the total fund requirement and the total budgetary allocation approved for the mission. The Committee also requested year-wise details of funds released and expenditure incurred since approval as well as the progress and key achievements made so far.

50. In response, the Department informed that the proposal for launching the Venus Orbiter Mission was approved by the Union Cabinet in September 2024. The mission is currently targeted for launch in March 2028, with an approved project cost of ₹824 crore. The Department further provided the year-wise details of budget allocation and expenditure incurred since approval. For the financial year 2024–25, the Budget Estimate (BE) was ₹1 crore, which was revised to ₹2.10 crore at the Revised Estimate (RE) stage, while no expenditure was incurred during the year. For the financial year 2025–26, the Budget Estimate was ₹50 crore, which was revised downward to ₹29.50 crore at the RE stage. As of 31st January 2026, an expenditure of ₹5.12 crore had been incurred. With regard to progress made so far, the Department stated that the configuration of the spacecraft has been finalized and the preliminary design review for the payloads and mainframe systems has been completed. In addition, procurement activities for various components required for the mission have been initiated.

51. With reference to the Venus Orbiter Mission, the Committee noted that the Department had been able to utilize only about ₹5 crore during the financial year 2025–26. This led to a downward revision of the allocated funds from ₹50 crore at the BE stage to ₹29.50 crore at the RE stage, out of which only ₹5.12 crore had been spent up to 31st January 2026. The Committee therefore sought clarification regarding the reasons for the underutilization of funds.

52. The Department explained that the major cash flow envisaged during the financial year 2025–26 was primarily linked to the signing of Memoranda of Understanding (MoUs) with autonomous institutions for the development of scientific payloads for the mission. The Department informed that an MoU with the Indian Institute of Space Science and Technology has already been signed and the transfer of funds has been completed. Further, the MoU with the Physical Research Laboratory is at an advanced stage of finalization and is expected to be concluded shortly. The Department also stated that certain payload devices, including Proto DAC and EPC

fabrication, have been finalized and that part shipments are expected before March 2026. The Department assured the Committee that all efforts are being made to fully utilize the Revised Estimate allocations by the end of the financial year.

53. The Committee notes the significance of India's forthcoming space missions, namely Chandrayaan-4, Chandrayaan-5 and the Venus Orbiter Mission. These missions represent important milestones in India's expanding space exploration programme and are expected to substantially enhance the country's scientific capabilities in planetary exploration. The Committee is of the view that successful execution of these missions will not only deepen scientific understanding of the Moon and Venus, but will also significantly strengthen India's standing in the global space community and further position the country as an emerging leader in space science and planetary exploration among the comity of nations. At the same time, the Committee notes with concern the slow pace of expenditure under these missions so far. In the case of Chandrayaan-4, an allocation of ₹150 crore was made at the Budget Estimate (BE) stage for the financial year 2025–26, which was subsequently revised downward to ₹21 crore at the Revised Estimate (RE) stage, while the actual expenditure incurred up to 31st January 2026 stood at ₹34.60 crore. Similarly, under Chandrayaan-5, an allocation of ₹2 crore was made at the BE stage for 2025–26, which was later revised upward to ₹14 crore at the RE stage; however, the actual expenditure incurred as of 31st January 2026 was only ₹0.58 crore. With regard to the Venus Orbiter Mission, the Committee notes that for the financial year 2024–25, the BE allocation of ₹1 crore was revised to ₹2.10 crore at the RE stage, but no expenditure was incurred during the year. Further, in the financial year 2025–26, the BE allocation of ₹50 crore was revised downward to ₹29.50 crore, while the actual expenditure incurred up to 31st January 2026 was ₹5.12 crore. The Committee is apprehensive that, if the pace of expenditure and project implementation continues at this level, the timely accomplishment of these missions as per the proposed timelines may become challenging. At the same time, the Committee agrees with the Department's

submission that scientific missions of this nature are inherently iterative in character and are often constrained by several technical and operational factors, including design finalization, availability of specialized components, vendor readiness and mission configuration requirements. The Committee is of the view that these missions are presently transitioning from the initiation phase to the execution phase, and therefore the cash flow requirements are likely to increase substantially in the coming year. In view of the strategic and scientific importance of these missions, the Committee strongly recommends that the Department take proactive steps to improve the pace of fund utilization and project implementation. The Committee further recommends that the Department institute robust institutional mechanisms for periodic monitoring and review of the progress of these missions at appropriate levels.

NAVIGATION WITH INDIAN CONSTELLATION (NavIC)

54. Navigation with Indian Constellation (NavIC) is India's independent navigation satellite system for providing position, navigation, and timing (PNT) services over India and 1500 km beyond Indian landmass. NavIC has signals in three frequencies. NavIC signals are interoperable with signals of the other global navigation satellite systems (GNSS) like GPS and Galileo. NavIC performance is also at par with that of the other GNSS.

55. NavIC system consists of three segments - Space segment, Ground segment and User segment. Space segment consists of seven satellites placed at the geosynchronous orbital altitude of ~ 36,000 km. All the seven satellites are co-phased so as to ensure navigation service over the defined coverage area. NavIC space segment consists of the initial IRNSS series of satellites, and the newer NVS series. Ground segment consists of a network of stations responsible for monitoring, orbit determination, and time synchronisation of the NavIC space segment. It comprises of precise timing facilities, range and integrity monitoring stations, two-way ranging stations, data centres, monitoring and control software suite, data communication network, centralised navigation centres, and satellite control facilities. The NavIC system time is steered to the Indian Standard Time (IST) to within a few nanoseconds, thereby ensuring traceable time for the user. User segment is comprised of government organisations, industry, academia, research institutions, and consumers. Receivers are available commercially off-the-shelf as well as custom-specific. Generally, these receivers have multi-GNSS

capability. For the purpose of promoting widespread applications and to encourage research and development, the signal details of NavIC are placed in public domain in the form of signal-in-space interface control documents (SIS ICDs). Using the ICDs, the developers have developed NavIC chipsets and receivers for various PNT applications.

56. The Committee sought information on the number of satellites forming the NavIC constellation. It also enquired whether any of these satellites are presently defunct and, if so, the reasons thereof and the proposed timeline for their replacement. In response, the Department submitted that 12 satellites have been launched so far and currently 8 satellites are operational. Four satellites are providing continuous PNT service. Four satellites (IRNSS-1A, 1C, 1E, and 1G) are utilized for one-way broadcast messaging service. These satellites cannot provide PNT service due to failure of in-orbit atomic clocks. One satellite (IRNSS-1D) is decommissioned after its life span. One mission was unaccomplished (IRNSS-1H). The recently launched satellite (NVS-02) could not reach the intended orbit and is now in elliptical orbit with limited PNT service envisaged. The replacement satellites NVS-03, NVS-04, and NVS-05 will be launched over the next 15-18 months.

57. The Committee also sought clarification as to whether these malfunctioning atomic clocks were manufactured indigenously in India or procured from external sources. In response, the Department stated that these atomic clocks had been procured from external vendors.The Department further informed that ISRO has now successfully developed indigenous atomic clocks, the performance and reliability of which have been demonstrated onboard the NVS-01 and NVS-02 satellites. At present, a combination of procured and indigenously developed clocks is being used in the NavIC satellites. The Department also stated that with the enhancement of production capacity of indigenous atomic clocks, dependence on externally procured clocks will be progressively reduced.

58. The Committee notes the strategic significance of the NavIC system, India's indigenously developed regional satellite-based navigation network. The Committee emphasizes that expanding the coverage, reliability and adoption of NavIC in the near future will be vital for enhancing India's technological self-reliance and strategic autonomy. However, the Committee notes with concern that out of the total 12 satellites envisaged under the NavIC constellation, only 8 satellites are currently functional, and some of the satellites are unable to provide positioning, navigation and timing services due to malfunctioning of onboard

atomic clocks. The Committee appreciates that ISRO has successfully developed indigenous atomic clocks and recommends complete switchover to indigenous atomic clocks at the earliest to minimize dependence on foreign vendors. The

Committee urges the Department to ensure the timely replacement of non-functional satellites and to adopt appropriate measures for improving the reliability and operational readiness of the NavIC constellation so that this strategic national asset can function at its full potential. The Committee also recommends the Government to provide adequate funds to the Department of Space to achieve these objectives.

LAUNCH PAD INFRASTRUCTURE

59. The Satish Dhawan Space Centre (SDSC) SHAR in Sriharikota serves as India's primary spaceport, featuring two operational launch pads and a dedicated Sounding Rocket Complex. Indian Space Transportation Systems are completely reliant on two launch pads viz. First Launch Pad (FLP) & Second Launch Pad (SLP) which are catering to the launches of the PSLV, GSLV and LVM3.

60. The FLP was realized during the 1989-1993 timeframe and became operational with the first developmental flight of PSLV in 1993. FLP is mostly utilized for PSLV flights and was also used for the recent developmental flights of Small Satellite Launch Vehicle (SSLV) as well as the Test Vehicle (TV). A few initial flights of GSLV were also carried out from FLP. In FLP, the vehicle integration is carried out on the launch pad within a Mobile Service Tower that is transported to a safe distance before launch and the vehicle is serviced through an Umbilical Tower. An additional integration complex i.e., PSLV Integration Facility (PIF) has been established at the First Launch Pad which will enable in increasing the launch frequency of PSLV vehicles from the existing capability of 6 launches per annum to 12 launches per annum from FLP.

61. The SLP was realized during the 1999-2004 timeframe and followed a different philosophy called the Integrate-Transfer-Launch (ITL) concept, wherein the launch vehicle is assembled separately on a Mobile Launch Pedestal (MLP) in a vehicle assembly building and the integrated vehicle is transported to the launch pad, which has an Umbilical Tower (UT) to service the launch vehicle during the pre-launch phase. SLP has been operational for more than 20 years catering to the launches of PSLV, GSLV & LVM3. An additional integration facility i.e., Second Vehicle Assembly

Building (SVAB) has been established at the SLP in order to increase the launch frequency. SLP is also getting ready to launch the human rated LVM3 for the Gaganyaan missions. Further, SLP is being adapted to support the servicing of the LVM3 variant with the Semi-cryogenic Booster Stage, which is expected to be launched by 2028-29 timeframe.

62. The Sounding Rocket Complex launch pad is a dedicated facility which is actively being utilized for launching of sounding rockets used for upper atmospheric and scientific research. The same launch pad was utilized for launching successfully the first sub-orbital rocket i.e., Vikram-S built by the private space start-up i.e., Skyroot Aerospace on November 18, 2022.

63. The Committee enquired whether the existing launch pad infrastructure at the Satish Dhawan Space Centre is adequate to meet the technical and operational requirements of next-generation launch vehicles. The Committee further enquired that, if the current infrastructure is not sufficient, whether the Department of Space proposes to upgrade or augment the existing launch facilities in view of evolving launch vehicle configurations, higher payload capacities and the requirements of future missions. In response, the Department submitted that the present launch pad infrastructure at the Satish Dhawan Space Centre is not fully adequate to meet the technical and operational requirements of next-generation launch vehicles. In this regard, the Department informed that the Second Launch Pad is being adapted to support the servicing and launch of the LVM3 variant equipped with a semi-cryogenic booster stage, which is expected to be operational in the 2028–29 timeframe. The Department further stated that the human-rated version of the LVM3 intended for the Gaganyaan missions is also planned to be launched from the Second Launch Pad, with certain essential augmentations being undertaken to support human spaceflight requirements.

64. The Department also informed that the Government of India approved the establishment of the Third Launch Pad at the Satish Dhawan Space Centre in 2025. TLP is targeted to be established within a duration of 4 years i.e., by 2029-30. The overall budget sanctioned for the TLP is ₹3984.86 Crores. Budget provision of ₹170.00 Crores is made in BE 2026-27.The proposed Third Launch Pad is intended to provide launch infrastructure for the next-generation launch vehicles of Indian Space Research Organisation and will also function as a standby facility for the Second Launch Pad. According to the Department, the Third Launch Pad is being designed with a universal and adaptable configuration capable of supporting multiple launch vehicle systems, including the Next Generation Launch Vehicle (NGLV), the LVM3 with a semi-cryogenic stage, and future launch vehicles intended for crewed lunar missions. The

establishment of this launch facility is expected to significantly enhance the launch capacity for LVM3 and Gaganyaan missions, while also addressing the evolving requirements of India's space transportation programme for the next 25–30 years.

65. The Committee sought to know the progress made in the establishment of the new spaceport at Kulasekarapattinam, Tamil Nadu. The Committee enquired regarding

the number of launch pads proposed at the facility and how this spaceport would differ from the existing launch facility at the Satish Dhawan Space Centre. The Department submitted that the SSLV Launch Complex at Kulasekarapattinam is being developed as India's second rocket launch facility and will cover an area of about 2350 acres. The facility is specifically intended to support missions of the Small Satellite Launch Vehicle (SSLV), which has already been developed and operationalized. The launch complex is planned to support the receipt, assembly, testing and launch of small satellite launch vehicles.

66. The Department further informed that the site has been strategically located near the southern tip of Tamil Nadu along the east coast. The location has been selected primarily to facilitate launches into Sun-synchronous Polar Orbit (SSPO), which is widely used for Earth observation missions, without requiring complex orbital manoeuvres. This allows the SSLV to carry a higher payload capacity, approximately up to 300 kg to SSPO from Kulasekarapattinam. In contrast, launches to similar orbits from Satish Dhawan Space Centre offer comparatively lower payload capability for SSLV missions.

67. The Department stated that the project was approved in 2019 with an overall estimated cost of ₹985.96 crore, and the facility is targeted for commissioning during the period 2026–27. The new spaceport will complement the operations of the Satish Dhawan Space Centre, which will continue to support heavier launch vehicles and major missions.

68. The Committee notes that robust launch pad infrastructure forms the backbone of any nation's space transportation capability. The ability to conduct launches depends significantly on the availability of launch facilities. In this regard, the Committee appreciates the initiatives taken by the Department of Space in expanding the country's launch infrastructure, including the establishment of the Third Launch Pad at Satish Dhawan Space Centre and the development of the SSLV Launch Complex at Kulasekarapattinam. At the same

time, the Committee observes that the existing launchpad infrastructure at Sriharikota comprises the First Launch Pad, which is nearly three decades old, and the Second Launch Pad, which has been in operation for over two decades. While these facilities have served the nation well, the Committee notes that India's space transportation system currently remains largely dependent on these two launch pads. Given the growing scale and complexity of India's space programme, the Committee is of the view that relying on a limited number of launch pads may pose operational risks. In this context, the Committee also draws attention to past instances such as the failure of launch infrastructure at the Baikonur Cosmodrome, which had a significant impact on Russian launch operations and highlighted the vulnerabilities associated with dependence on limited launch facilities. The Committee therefore considers it imperative that India proactively strengthen and diversify its launch infrastructure. The Committee notes that the proposed Third Launch Pad at Sriharikota is expected to become operational by 2029–30 and will significantly augment the country's launch capabilities. However, considering the expanding scope of India's space activities, the increasing demand for satellite launches, and emerging missions including human spaceflight and planetary exploration, the Committee is of the view that the country will require additional launch infrastructure in the long run. The Committee therefore recommends the Department to assess whether the existing and upcoming infrastructure, including the Third Launch Pad and the SSLV Launch Complex at Kulasekarapattinam, will be sufficient to meet India's future launch requirements. Further, considering the long gestation period involved in the planning and construction of launch pads and associated facilities, the Committee recommends the Department to undertake a comprehensive long-term assessment of the number of launch pads and spaceports that India may require over the next thirty years, keeping in view the ageing launch pad infrastructure, increasing launch frequency and the country's growing space ambitions. Further, the Committee strongly recommends the Department to take all necessary steps to ensure the

timely completion and operationalization of the Third Launch Pad at Sriharikota and the SSLV Launch Complex at Kulasekarapattinam.

PROPULSION TECHNOLOGY

69. The Committee enquired whether ISRO is developing a semi-cryogenic engine

and, if so, the current status of its development and the advantages of a semi-cryogenic engine compared to a cryogenic engine. In reply, the Department submitted that ISRO is currently developing a high-thrust semi-cryogenic engine designated SE2000. The development programme has reached an advanced stage, with several engine sub-assemblies already fabricated. The integrated engine hot test is targeted to be conducted by the end of 2026. Necessary test facilities for the development programme have also been established.

70. As regards the advantages of semi-cryogenic engine over cryogenic engine the Department informed that semi-cryogenic engine uses kerosene as fuel, which can be stored at near-ambient temperature, and liquid oxygen as the oxidiser. In contrast, cryogenic engines use liquid hydrogen as fuel stored at extremely low temperatures (around 20 K) along with liquid oxygen as the oxidiser. Kerosene has a significantly higher density compared to liquid hydrogen, allowing propellant to be stored in smaller tanks and resulting in a higher density impulse. This makes semi-cryogenic engines particularly suitable for high-thrust booster stages. Additionally, the operational complexities associated with handling liquid hydrogen are avoided. For these reasons, semi-cryogenic engines are widely used by major space-faring nations as powerful booster engines in launch vehicles.

71. The Committee notes that the development of semi-cryogenic propulsion technology is of considerable strategic importance for India's space programme. The Committee recalls that India had faced significant challenges in the past in accessing critical propulsion technologies, particularly during the early stages of the development of cryogenic engines, when international technology transfer restrictions necessitated the pursuit of indigenous capabilities. In this context, achieving self-reliance in semi-cryogenic propulsion assumes great importance for strengthening the country's launch vehicle capabilities. The Committee further observes that several major space-faring nations rely on semi-cryogenic engines for

high-thrust booster stages due to their operational efficiency, higher propellant density and suitability for heavy-lift launch vehicles. The successful development of such engines would enhance India's ability to launch heavier payloads, support next-generation launch vehicles and expand the scope of future missions. In view of the strategic, technological and operational advantages associated with this

capability, the Committee recommends the Department to accord high priority to the development of the semi-cryogenic engine and expedite efforts to realise this critical technology at the earliest.

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY (IIST)

72. IIST, established in 2007 in Thiruvananthapuram, Kerala, is Asia's first space university and a premier autonomous institution under the Department of Space. Indian Space Research Organisation (ISRO) needs highly talented Scientists and Engineers to take up the challenges of R&D in the areas of Space Science and Technology. The Space Commission in its 107th meeting held on November 18, 2006 approved setting up of Indian Institute of Space Science and Technology (IIST), an institute of excellence with undergraduate, postgraduate and doctoral programmes as well as research in Space Science and Technology. The objective is to create a world class educational institute of excellence with the unique aim of integrating education with high technology research with a view to offer undergraduate/post graduate programmes in Space Science, Space Technology and Space Applications and in other emerging areas of high technology relevant to national aerospace and advanced science goals. ISRO conducts annual campus placements from IIST to induct IIST graduates into ISRO based on vacancy. The IIST alumni have significantly contributed to landmark missions like Chandrayaan-3, Aditya-L1, and the upcoming Gaganyaan mission. IIST collaborates with international institutions like Caltech, JPL (USA), and TU Delft, facilitating high-level student fellowships and joint research through MoUs.

73. Key activities of IIST are detailed below**:**

i. **Academic Programmes:** IIST offers 2 Undergraduate (B.Tech) courses, 16 Post graduate (M.Tech) courses, 7 PhD courses and a unique 5-year Dual degree course.

ii. **Advanced Research:** Research spans seven (7) departments, focusing on niche areas such as satellite technology, electric propulsion, quantum optics, and planetary geosciences. The Advanced Space Research Group (ASRG) at IIST acts as a specialized bridge between academic research and the practical requirements of the ISRO. ASRG identifies and develops

technologies critical to upcoming national missions. This ensures that academic research is not just theoretical but solves real-world engineering bottlenecks for various projects.

74. Major Achievements of IIST are as detailed below**:**

i. Space Missions:

a) Successfully developed and launched student-led payloads and satellites, including INSPIRESat-1 (2022) to study ionospheric dynamics and solar coronal heating and the technology demonstration payload PILOT on PSLV-C55 (2023).
b) POEM Mission: IIST has successfully flown multiple technology demonstration payloads on ISRO's PSLV Orbital Experimental Module (POEM), including PILOT-G2 (GRACE) in early 2026 to test 3D-printed satellite structures.
c) Designed and launched "Vyom," the first student-designed sounding rocket in Asia, to test solid rocket motors and accelerometers.
d) Notable upcoming missions include AHAN (for radiation studies) and ISAT-2 (demonstrating pulsar-based navigation).

ii. Recent Milestones (2024-2026):

a) Established a state-of-the-art 5G/6G Testbed facility
b) Spearheaded the "CROP SEEDS on ISS" experiment for Axiom-4 Mission.

c) Participating in the Human Spaceflight program (Gaganyaan):
d) Space Biology: Developing a biology payload to study spaceflight-induced changes in kidney stone formation using Drosophila flies for the first Gaganyaan uncrewed flight.
e) Humanoid Support: Researching Humanoid-in-loop Plant Experiments (HOPE) to support life sustaining systems for future crewed missions.
f) Crew Health Monitoring: Partnering with Danish Aerospace Co. to develop exhaled breath analyzers for monitoring astronaut health.
g) MoU with IIT Madras for research in advanced manufacturing for space infrastructure.
h) MoU with Kerala Space Park aimed at building a local ecosystem for space start-ups.

iii. Technology Innovations and Patents:

a) Indigenous developments: The in-house developed Electrical Power Systems (EPSs) and Onboard Computers (OBCs) are qualified for use in future small satellite missions. Diagnostic tools for Electric Propulsion Thruster performance evaluation were developed.
b) Quantum Research: Demonstrated Bright Quantum Squeezed Light, a significant milestone for advancing secure quantum communications in space.
c) Patents Granted: IIST has secured numerous patents, including a closed loops MEMS accelerometer, a swirl-stabilized liquid fuel burner, and a Bionic Micro Aerial Vehicle wind design.

iv. Advanced Scientific Research:

a) Publications: Faculty and students have contributed over 4,500 research publications in high-impact journals.
b) Human Space Flight Research: Spearheading critical research for India's human spaceflight program, including space biology experiments (e.g., studying kidney stone formation in microgravity) and developing human thermal behavior models for astronauts.
c) Atmospheric Science: The Ponmudi Climate Observatory, operated by IIST, provides large amounts of data on aerosol-cloud interactions and ionospheric conditions for global climate modeling.

75. The Indian Institute of Space Science and Technology (IIST) is a premier educational institution established to develop a highly skilled workforce for the Indian space sector, particularly the Indian Space Research Organisation. Since its inception, the institute has awarded more than 1,870 undergraduate degrees and 226 Ph.D. degrees. Out of its 2,000+ alumni, over 1,500 are actively employed within the broader space sector, including ISRO and various private aerospace companies. More than 90 IIST graduates are currently contributing to India's growing private space ecosystem, working in research, technical, and managerial roles across multiple startups. Additionally, at least five space-technology startups have been co-founded by IIST alumni. The institute consistently ranks among India's leading engineering institutions, securing the 51st position in the 2024 edition of the National Institutional Ranking Framework rankings, and it currently holds an A++ accreditation from the National Assessment and Accreditation Council. IIST offers Asia's first dedicated academic curriculum focused on space science and technology, developed in close collaboration with ISRO to meet the specialized needs of the space industry. Research conducted at the institute contributes directly to major national missions such as Gaganyaan, Chandrayaan-3, and Aditya-L1.Within just two decades, IIST has not only produced highly trained professionals for ISRO but has also seen many of its graduates pursue advanced studies abroad with notable accomplishments. The institute's students and faculty maintain a strong record of academic output, with more than 4,500 research publications in high-impact journals along with several patents.

76. The Committee then enquired the Department whether any proposal for grant of Institution of National Importance (INI) status to IIST is currently under consideration. In response, the Department stated that the proposal to grant INI status to IIST is presently under consideration and is undergoing the consultation process to obtain the required approvals.

77. The Committee also sought information on how INI status would benefit IIST. In response, the Committee was informed that, at present, IIST functions as a "Deemed to

be University" under the regulatory framework of the University Grants Commission (UGC). Granting Institution of National Importance (INI) status to IIST would substantially elevate the institute's stature and transform it from a specialized institution into a globally competitive research university dedicated to the entire spectrum of space science and technology. Such recognition would place IIST at par with premier institutions such as IITs, IISERs and NITs, thereby enhancing its academic credibility

and providing greater recognition to its students and alumni. INI status would also provide IIST with enhanced autonomy in both academic and administrative matters. This would enable the institute to update curricula more rapidly in response to technological developments, introduce innovative academic programmes, and adopt modern educational practices such as credit transfer systems, joint programmes with international universities, and specialized courses for professionals engaged in the space industry. Further, the enhanced status would support the development of interdisciplinary programmes integrating engineering, management, policy and economics to address the complex challenges of the space sector. It would also enable the institute to access dedicated funding from the Government of India, facilitating the creation of advanced research infrastructure, incubation centres, and research parks. Such initiatives could help translate academic innovations into viable aerospace startups and establish national-level research facilities accessible to universities across the country**.**

78. The Committee recognizes the significant role played by the Indian Institute of Space Science and Technology (IIST) in advancing education, research, and human resource development in the space sector. Since its establishment, the institute has contributed meaningfully to strengthening the national space programme and nurturing skilled professionals for the Department of Space and allied organizations. The Committee is of the view that conferment of INI designation would also strengthen IIST's global visibility and foster deeper collaborations with leading international space agencies and research institutions,

while allowing the institute greater operational flexibility, including the establishment of off-campus centres and continued participation in the JEE Advanced admission framework. In view of these strategic advantages, the Committee strongly recommends that INI status be granted to IIST at the earliest.

INSTITUTIONAL ARCHITECTURE OF INDIA'S SPACE SECTOR

Antrix Corporation Limited

79. The Committee sought information from the Department on the various products and services that are commercialized and marketed by Antrix Corporation Limited, details of the company's turnover over the past five years, the revenue generated or losses incurred during the same period, and the total investment made by the Government of India in it. In response, the Department informed that Antrix is engaged in providing space data products and services such as supply of remote sensing data services, transponder lease services, launch services, mission support services and other allied services.

80. The details of turnover of Antrix for the last five financial years furnished by the Department are reproduced below:-

	Financial Years (₹ in Crores)				
	2020-21	**2021-22**	**2022-23**	**2023-24**	**2024-25**
Turnover [excluding Other Income]	654.38	181.64	38.16	91.97	76.77

The details of revenue generated*/loss incurred by Antrix for last five financial years furnished by the Department are reproduced below:-

	Financial Years (₹ in Crores)				
	2020-21	**2021-22**	**2022-23**	**2023-24**	**2024-25**

Profit before Tax (₹ in Crores)	77.22	36.24	64.91	84.50	77.87

**revenue generated is assumed to be Profit before Tax*

The Department has further informed that the total investment of Government of India in the form of fully paid up share capital in Antrix is ₹ 6.80 crores inclusive of buy back of shares and bonuses issued by the Company during 2017-18.

81. The Committee enquired about the reasons for the decline in the turnover of Antrix from around ₹654 crore in 2020–21 to ₹76.77 crore in 2024–25. The Department stated that in FY 2020–21, revenue was mainly generated from foreign satellite transponder leasing services under the SATCOM business segment. However, as several SATCOM and launch agreements concluded and were not replaced by comparable new contracts, overall business activity declined, resulting in a reduction in revenue from FY 2020–21 to FY 2024–25.

New Space India Limited

82. The Committee enquired as to what factors led the Government to establish New Space India Limited (NSIL) when Antrix Corporation Limited was already operational. The Committee also asked as to how the nature of business undertaken by Antrix differs from that of NSIL. The Department submitted that over the past decade, the space sector has entered a new phase marked by the growing prominence of commercial space activities. Earlier, space programmes were largely driven by government funding and initiatives. The Indian space programme has developed a wide range of indigenous technologies across the entire space value chain, including launch vehicle development, satellite manufacturing, ground segment infrastructure, and satellite-based services such as communication, earth observation, and navigation.

83. In order to harness the commercial potential of India's space capabilities and to create a self-sustaining business model for commercial activities across both upstream and downstream segments of the space value chain, the Government of India incorporated NSIL. The company was established with an expanded mandate to operate with greater flexibility and a market-oriented approach. Its key responsibilities include: (i) building, owning, launching, and operating communication and earth observation satellites to meet customer requirements; (ii) manufacturing launch vehicles to address customer launch needs; (iii) providing launch services to international clients; (iv) delivering satellite-based services; and (v) facilitating the transfer of space technologies to industry.

84. The Department further explained that the role of Antrix was largely limited to acting as a contract manager responsible for marketing ISRO's products and services. Antrix did not own space assets nor did it undertake manufacturing of launch vehicles or satellites. In contrast, NSIL has been given a broader mandate that includes owning, operating, and launching space assets, as well as undertaking manufacturing activities related to launch vehicles and satellites.

85. The Committee sought information from the Department on the various products and services that are commercialized and marketed by NSIL, details of the company's turnover over the past five years, the revenue generated or losses incurred during the

same period, and the total investment made by the Government of India in it. The Department submitted that NSIL is engaged in commercialization and marketing of the following products and services:

- Production of launch vehicles including PSLV, LVM3 and SSLV to cater to launch demand from international market
- Building satellites for communication and earth-observation to meet user's demand
- Providing satellites-based services from NSIL owned/ operated fleet of communication and EO satellites
- Providing commercial launch services to domestic and international customers onboard PSLV, LVM3 and SSLVs.
- Establishment of Ground Segment for Communication and Earth Observation Satellites on Turn-key Basis.
- Providing Telemetry, Tracking and Control [Mission Support Services] to Global Customers.
- Technology transfer to industry

86. The details of turnover of NSIL for the last five financial years furnished by the Department are reproduced below:-

(₹ in Lakhs)

2024-2025	**2023-2024**	**2022-23**	**2021-22**	**2020-21**
2,76,155.96	2,37,925.45	2,84,226.43	1,67,476.84	51,330.71

*2023-24 restated in 2024-25

The details of revenue generated by NSIL for last five financial years furnished by the Department are reproduced below:-

Revenue(Profit) generated/Loss (Profit after Tax (PAT)) (₹in Lakhs)

2024-2025	**2023-2024**	**2022-23**	**2021-22**	**2020-21**
82,220.18	79,603.06	45,998.07	34,298.62	15,889.54

*2023-24 restated in 2024-25

The details of revenue generated by NSIL against various heads during the last three years furnished by the Department are reproduced below:

(₹ in Lakhs)

Particular	2022-23	2023-24	2024-25
PSLV production	-	-	-
SSLV manufacturing	-	-	-
Launch Services	1,16,613.16	21,821.10	44,743.13
Satellite based Services	1,67,086.55	1,82,573.57	1,89,171.00
Satellite building and sub-systems	-	-	-
Technology transfers	125.72	269.00	240.49

The total Investment of the Govt. of India in NSIL is ₹5,607.60 Cr

87. The Committee enquired whether the Internal and Extra Budgetary Resources (IEBR) mobilized by NSIL and Antrix Corporation Limited are credited to the Consolidated Fund of India or retained and utilized to finance their own capital and research requirements. The Department submitted that the Internal and Extra Budgetary Resources (IEBR) mobilised by the Antrix and NSIL are retained by them to fund capital expenditure and development projects.

88. The Committee commends the contributions made by Antrix Corporation Limited and New Space India Limited (NSIL) towards the growth of India's space sector and the development of a vibrant space economy. However, the Committee notes with serious concern the sharp decline in the turnover of Antrix Corporation Limited, which has decreased from about ₹654 crore in 2020–21 to ₹76.77 crore in 2024–25. The Committee also observes that the turnover of NSIL has witnessed a declining trend over the years, particularly in respect of revenue generated from launch services. The Committee has been given to understand that the Internal and Extra Budgetary Resources (IEBR) mobilised by Antrix and NSIL are retained by these entities to fund capital expenditure and support various development projects. In this context, the Committee emphasises that higher revenue generation would directly translate into greater availability of funds for

investment in capital infrastructure and further development of the space sector. The Committee, therefore, recommends that the Department should take proactive and concerted steps to enhance resource mobilisation by these entities. This may include pursuing commercialization opportunities more vigorously, strengthening marketing strategies, and exploring new domestic and international markets for launch services, satellite services, and other space-based applications, so as to augment revenue generation and support the continued expansion of India's space economy.

SPACE LAW

89. The Committee was given to understand that the Indian Space Policy-2023 mandates IN-SPACe to act as the single window agency for the Authorization of Space Activities by Government entities as well as Non Government Entities. In this context, the Committee sought clarification on the meaning of authorization and the specific space activities that require such authorization. The Department replied stating that authorization accounts for the permission to conduct the identified Space Activity along with the terms and conditions to be adhered to by the authorized entity while carrying out the authorized activity. Different types of space activities such as establishment and/or operations of Space Object(s), enabling provisioning of non-Indian communication satellites capacity, undertaking launches, establishment and operations of the ground systems, dissemination of high-resolution remote sensing data, space situational awareness activities, space exploration and re-entry of space objects, etc. require authorization.

90. The Committee asked the Department to provide the details of no. of authorizations issued to ISRO and other Government entities/non-Government entities so far. The Department informed that a total of 126 number of authorizations were issued by IN-SPACe till 31st January 2026. Out of these 93 numbers of authorizations were issued to Non-Governmental Entities (NGEs) and 32 nos. to ISRO and 01 no. to other Government entity.

91. The Committee enquired whether the authorization mechanism affects the functional and institutional autonomy of ISRO. In reply, the Department stated that authorization is granted on the basis of information, declarations, and confirmations provided by ISRO with respect to the stipulated aspects and considerations for authorization. The Department further clarified that the authorization process does not

assess, guarantee, or endorse the technical performance, compliance with specifications, or the quality of service arising from the authorized activity. These aspects continue to be ensured by ISRO independently, without any involvement of IN-SPACe.

92. Subsequently, the Committee inquired the Department if the Government is contemplating bringing any legislation to regulate space activities in the Country. In response, it was submitted that the Department is in advanced stage of drafting a Bill to regulate and authorize the space activities in the country. The proposed Bill seeks to comprehensively define the entities permitted to undertake space activities in the Country, provide for the establishment of the Indian National Space Promotion and Authorisation Board, and specify the powers of the Board. It will also lay down the authorization process for space activities, address legal implications, provide for a Tribunal to adjudicate complaints, outline liabilities arising from space activities, stipulate insurance requirements, prescribe penalties for unauthorized activities, and incorporate other relevant provisions.

93. The Committee notes that, at present, space-related activities in the country are not governed by a comprehensive legislative framework and are largely guided by policy documents, vision statements, and mission guidelines. In view of the rapid expansion of space activities in recent years, their increasing strategic and security implications, and the growing participation of Non-Governmental Entities (NGEs) in the space sector, the Committee is of the view that there is a clear and pressing need for a comprehensive legal framework to regulate, authorize, and oversee space activities in the country. The Committee, therefore, welcomes the initiative of the Department of Space in drafting a Bill to regulate space activities and expects that the proposed legislation will provide a robust, transparent, and forward-looking framework for the orderly development of the space sector in India. At the same time, the Committee observes that the authorization mechanism under the Indian Space Policy, 2023 currently applies to Government entities, including ISRO and other agencies functioning under the Department of Space. The Committee notes that these agencies already operate under the administrative oversight of the Department of Space and their activities are subject to approval by the Department as well as the Space Commission. In such a scenario, the

requirement for these entities to obtain authorization from IN-SPACe, an institution that also functions under the Department of Space, may result in an additional procedural layer within the Government system. Keeping in view the principle of *"Minimum Government, Maximum Governance"*, the Committee is of the considered opinion that the authorization mechanism should primarily be intended to regulate and facilitate the activities of Non-Governmental Entities entering the space sector. The Committee, therefore, recommends that the requirement of authorization for ISRO and other agencies functioning under the Department of Space may be gradually dispensed with. The Committee further

recommends that an appropriate provision to this effect may be incorporated in the proposed Space Activities Bill so as to streamline governance, avoid procedural duplication, and ensure greater administrative efficiency within the space sector.

TECHNOLOGY TRANSFER AND PRICING IN INDIA'S SPACE SECTOR

94. The Committee requested the Department to elaborate on the technology transfer process followed by NSIL and to provide details of the technologies transferred by NSIL since its inception, including information on the fees received through such transfers. In response, the Department submitted that NSIL has been transferring various technologies developed at ISRO/ Department of Space. As on date, NSIL has signed 100 Technology Transfer Agreements for transferring 61 technologies developed at ISRO/ Department of Space to Indian Industry. The Department has further submitted that the process of technology transfer includes the following steps:

- Non-Government Entity (NGE) will submit the request for TT through IN-SPACe Digital Platform.
- IN-SPACe will do initial processing of application including evaluation of Industry with the technical support of ISRO.
- Standing Committee constituted by IN-SPACe finalises the Technology Transfer Fees (TTF) based on TT Cost, potential transfer of technologies to Industries, etc
- NSIL, INSPACe and NGE will sign the Tripartite Technology Transfer Agreement (TTA).
- Post TTA signing, NSIL handholds the industry for all aspects related to TT including Handing over of TT Document, Training to Industry, Coordination between ISRO and NGE, Certification of unit produced by NGE by ISRO, etc.
- NSIL receives the TTF and transfers TT Cost to DoS.
- NSIL coordinates with NGE for Technology assimilation, production and royalty collection.

95. The Department has also provided the details of technologies transferred by NSIL since its inception including the information on the fees received through such transfers. These details are presented in the Annexure attached to this Report. Upon reviewing the data, the Committee observed that NSIL has, in certain cases, transferred technologies for a nominal fee as low as ₹6,000, and in some instances, without charging any fee at all. The Committee noted that the license fees appear disproportionately low compared to the commercial potential of many of these technologies and sought the Department's view on whether a more competitive and market-aligned pricing framework for technology transfer is needed. In response, the Department explained that NSIL had transferred the "Distress Alert Transmitter – 2nd Generation" technology at a very low price to industry. This device is primarily used by fishermen on small boats for sending emergency messages with position information,

and it can also provide useful alerts such as Potential Fishing Zones and weather updates. Since this technology is intended for societal benefit, it was transferred to industry at a low or zero price for those who had already taken the first-generation DAT technology. The Department further stated that it is moving towards a more competitive and market-aligned pricing framework for technology transfer. To this end, IN-SPACe has constituted a Standing Committee comprising members from the Department of Space, ISRO Headquarters, IN-SPACe, NSIL, and the respective ISRO centre that developed the technology. This Committee evaluates technology transfer fees holistically, taking into account factors such as technology development costs, market potential, the number of industries capable of assimilating the technology, and possible spin-off applications, to arrive at a fair and appropriate pricing for each transfer.

96. The Committee expresses concern over the transfer of technologies in the space sector at disproportionately low prices relative to their commercial potential. It has been observed that technologies are often transferred to private players at undervalued rates, allowing these partners to earn significant profits while the originating institutes receive only a marginal share of the value created. Furthermore, there is no credible mechanism to verify whether the benefits of low-cost technology transfers are being passed on to the intended target users for whom the technologies were developed. In view of this, the Committee recommends that the Department of Space should consider adopting a more competitive and market-aligned pricing framework for technology transfer.

Licensing fees should appropriately reflect the true commercial value, uniqueness, and societal impact of technologies developed through public funding. Additionally, the Committee recommends the establishment of clear guidelines to determine technology transfer costs, and that the Standing Committee constituted by IN-SPACe for evaluating technology fees should calculate fees in accordance with these guidelines. To ensure transparency and accountability, the Committee further recommends that all technology transfer agreements be subject to periodic third-party audits.

START-UPS IN THE SPACE SECTOR

97. As per Start up India portal of DPIIT, the number of space start-ups registered is reached to 400. The Committee sought information regarding the key achievements of start-ups in the space sector and the the initiatives taken by the Government of India to promote them. In response, the Department informed that the following are the major achievements of start-ups in the space sector:

i. Approximately USD 150 million has been raised as investment during calendar year 2025, and in addition, the top 10 space start-ups have a confirmed order book of about USD 150 million.
ii. Two private sector companies namely M/s. Skyroot and M/s. Agnikul tested and flown their launch vehicle at sub orbital orbit in November 2022 and May 2024 respectively.
iii. A total of 25 payloads flown/going to fly on PSLV Orbital Experimental Module (POEM) which helps NGE's test and prove the space flightworthiness of their payloads.
iv. A total of 6 Indian NGEs has launched 18 satellites in orbit.
v. Higher throughput of launch vehicles with the technology transfer of SSLV.
vi. 25 number of companies already testing their satellites /subsystems in the real environment of space by taking advantage of platforms like POEM.
vii. State government seeing space as a sunrise sector and making proactive policies to encourage companies in this domain through incentive schemes.
viii. Indian space companies slowly beginning to embed in global aerospace and space supply chains.
ix. An Earth Observation (EO) satellite constellation is being realized under PPP model, by a startup consortium led by M/s. Pixxel Space India private limited.

98. The Department has further informed that the Government of India has announced/launched the following initiatives in order to promote Space Start-ups in the country:

i. Establishment of Indian National Space Promotion and Authorization Centre (IN-SPACe), to promote handhold and authorise space activities by private sector.
ii. Brought out India Space Policy 2023, with the define roles responsibilities of all the stakeholders,
iii. Brought out liberalised Foreign Direct Investment (FDI) policy for the space sector.
iv. Brought out following schemes for access to finance and enablement of start-ups:
    a) Established Rs. 1000 Crores Venture Capital Fund
    b) Establishment of Rs. 500 Crores Technology Adoption Fund (TAF) for the development and commercialisation of space technology
    c) IN-SPACe Seed Fund Scheme for translating idea into product
    d) IN-SPACe Pre-incubation Entrepreneurship (PIE) Program for the identification and grooming of entrepreneurs in the space sector.
v. Facilitation in terms of use of ISRO facilities and mentorship to handhold the private sector
vi. Undertaken skill development initiative to fill the gaps in the space sector
vii. Establishment of a Technical Centre for providing testing and simulation of space systems with price support.
viii. Enabling transfer of technology from ISRO.
ix. Awarded contract to the private consortium to bring out the Earth Observation (EO) satellite constellation under PPP model.

99. The Committee appreciates the initiatives taken by the Government of India to promote start-ups in the space sector. The Committee also notes the rapid emergence of start-ups in India's space ecosystem, which is a positive development for the growth and diversification of the sector. The Committee observes that ISRO continues to rely on foreign vendors for certain critical components and technologies. For instance, the atomic clocks used in NAVIC system were imported from a foreign vendor and their malfunctioning rendered some satellites defunct making them unable to provide the intended positioning, navigation, and timing services. Additionally, scientific missions are often delayed due to supply chain bottlenecks, highlighting vulnerabilities in the domestic space manufacturing ecosystem. In this context, the Committee is of the view that start-ups should be actively leveraged to bridge these critical gaps and complement ISRO's

capabilities. Encouraging diversification in the domestic space industry is crucial to reduce dependence on foreign suppliers. Therefore, the Committee recommends the Department of Space to identify areas where the country is still reliant on foreign vendors and proactively support start-ups in these domains through funding, technology transfer, and market access.

APPLICATIONS OF SPACE SCIENCE AND TECHNOLOGY

100. The Committee enquired the Department whether ISRO is undertaking real-time or more frequent analysis of forest cover mapping in India. In response, the Department submitted that ISRO has developed and operationalized techniques for monitoring forest cover using satellite data, which are implemented by the Forest Survey of India under the Ministry of Environment, Forest and Climate Change. As part of the biennial assessment of India's forest resources, the Forest Survey of India carries out mapping of forest cover and changes relative to previous assessments. This data is published in the "India State of Forest Report" and is generated using IRS LISS-III satellite imagery. The Department further informed that a web-based Forest Loss Information System has been developed by ISRO for the North Eastern Region (NER) to detect annual changes in forest cover. This system has been installed across all Forest Departments in the NER to assist in monitoring and management. In addition, the Department stated that a Forest Resources Analysis and Monitoring System (FRAMS) has been implemented for the Government of Manipur. This system enables generation of deforestation alerts on a monthly basis using time-series satellite data, allowing for more frequent monitoring of forest cover changes.

101. The Committee notes with concern that forest cover in India is under pressure and requires closer monitoring. At present, the Forest Survey of India publishes the biennial India State of Forest Report which assesses the extent of forest and tree cover across the country. The Committee emphasizes that forests play a crucial role not only in carbon sequestration and climate mitigation but also in supporting the country's economy and ecological balance. In view of their strategic and environmental importance, the Committee feels that forest cover monitoring should be carried out more frequently, preferably at least on a quarterly basis, rather than biennially. The Committee appreciates that the

Department of Space has developed a web-based Forest Loss Information System for the North Eastern Region, which detects annual changes in forest cover using satellite imagery. Additionally, the Forest Resources Analysis and Monitoring System (FRAMS) implemented for the Government of Manipur generates deforestation alerts on a monthly basis using time-series satellite data. These initiatives represent important steps towards more frequent monitoring of forest resources. The Committee observes that Brazil monitors its forest cover, particularly in the Amazon region, on a daily basis through advanced satellite systems. The National Institute for Space Research (INPE), Brazil operates the DETER system (System for Alerts of Deforestation and Degradation) which provides near real-time, daily alerts on deforestation and forest degradation, enabling immediate action against illegal activities. In this context, the Committee recommends ISRO to examine the functioning of such real-time monitoring systems, collaborate with Forest Survey of India and the Ministry of Environment, Forest and Climate Change, and develop a similar operational system for India.

ANNEXURE

The details of technologies transferred by NSIL since its inception are detailed below:

Sl No	Year	Technology	Transferred to	Fee/revenue earned
1	04-12-2020	Distress Alarm 2nd Generation	VTL Electronics	46,000
2	04-12-2020	Silica Aerogel Powder & Composite Sheets	Bhukhanvala Industries	12,96,050
3	04-12-2020	SCPC Modem	Astra Microwave Products Limited	13,80,000
4	04-12-2020	Distress Alarm 2nd Generation	Azista Industries Pvt Ltd	6,000
5	01-12-2020	Distress Alarm 2nd Generation	Komoline Aerospace Limited	46,000
6	25-11-2020	Realization of CC Composite through FB-CVI	Azista Industries Pvt Ltd	10,36,150
7	16-12-2020	Low Density EPDM based Thermal Insulation	Economic Explosives Limited	7,61,266
8	16-12-2020	Rocasin	Economic Explosives Limited	3,45,000
9	21-12-2020	Distress Alarm 2nd Generation	Stesalit Systems Limited	46,000
10	16-12-2020	Distress Alarm 2nd Generation	Alpha Design Technologies Pvt Ltd	6,000
11	16-12-2020	Silica Aerogel Powder & Composite Sheets	Anabond Limited	12,96,050
12	16-12-2020	EFA 1753 & 1752	Anabond Limited	6,17,550
13	24-12-2020	Low Density EPDM based Thermal Insulation	Aerospace Materials Pvt Ltd	7,61,266
14	23-02-2021	Benzoxazine Polymer	BHOR Chemicals & Plastics	57,500

Sl No	Year	Technology	Transferred to	Fee/revenue earned
15	31-03-2021	Rocasin	Ramesh's Aerospace Products & Services Pvt Ltd	3,45,000
16	20-07-2021	Low Density EPDM based Thermal Insulation	ICOMM Tele Limited	7,61,266
17	20-07-2021	Rocasin	ICOMM Tele Limited	3,45,000
18	22-12-2021	EFA 1753 & 1752	BHOR Chemicals & Plastics	6,17,550
19	15-12-2021	Silica Aerogel Powder & Composite Sheets	Karnest Technology Pvt. Ltd.	12,96,050
20	24-06-2022	Low Density EPDM based Thermal Insulation	Ramesh's Aerospace Products & Services Pvt Ltd	7,61,266
21	05-07-2022	Low Modulus Flex Seal Rubber Compound	Ramesh's Aerospace Products & Services Pvt Ltd	1,80,746
22	05-07-2022	Optical Imaging System	Paras Defence and Space Technologies Ltd.	6,90,000
23	29-08-2022	Silica Fibre	Lanexis Enterprises Pvt. Ltd.	57,500
24	14-11-2022	IMS Bus	Alpha Design Technologies Pvt Ltd	1,54,48,000
25	14-09-2022	HTPB	Economic Explosives Limited	53,76,375
26	09-01-2023	Low Density EPDM based Thermal Insulation	RR Industries, Hyderabad	7,61,266
27	24-01-2023	Phenolic Resin PF 106	VND Cell Plast	57,500
28	24-01-2023	Phenolic matrix Resin PF 108	VND Cell Plast	57,500
29	15-05-2023	indian mini satellite-1 (ims-1) bus	Dhruva Space Pvt. Ltd	77,24,000

Sl No	Year	Technology	Transferred to	Fee/revenue earned
30	20-09-2023	Flameproofing Coating-Caspol	United Fire Equipment	2,10,735
31	20-09-2023	Ground Penetration radar (GPR)	Augsenselab	7,36,360
32	20-09-2023	Two-way MSS terminal	Azista Industries Pvt. Ltd.	4,75,020
33	20-09-2023	MiniSAR: X band Airborne SAR	Data Patterns	52,60,080
34	20-09-2023	MiniSAR: X band Airborne SAR	Astra Microwave Products Ltd.	52,60,080
35	20-09-2023	RF Design of Ku-band 6-port Tx-Rx Monopulse Feed System	Comsat Systems Pvt. Ltd.	1,86,760
36	20-09-2023	Optical Imaging System	Optimized ElectrotechPvt. Ltd.	2,15,390
37	09-10-2023	Distress Alert Transmitter-Second Generation (DAT-SG)	Kerala State Electronics Development Corporation Ltd. (KELTRON)	1
38	09-10-2023	Piezo Electric Vibration Sensor	Central Electronics Limited (CEL)	3,04,850
39.	09-10-2023	Two-way MSS terminal	Kerala State Electronics Development Corporation Ltd. (KELTRON)	4,75,020
40	16-11-2023	PF-108	Polyformalin Private Limited	35,000
41	16-11-2023	ROCASIN	Rehabilitation Plantations Ltd	2,10,000
42	16-11-2023	PC-10 TPS	Atul Limited	35,000
43	16-11-2023	Two-Way MSS terminal	SCI-COM Software India Private Limited	4,75,020
44	11-01-2024	Digital ASIC for IDU of SATCOM Terminal	ICON Design Automation Pvt Ltd	9,00,057

Sl No	Year	Technology	Transferred to	Fee/revenue earned
45	14-02-2024	Silicon Rubber Adhesive SCA-911	Anabond Limited	21,47,719
46	14-02-2024	Water Proofing Compound (RWPC-03)	Anabond Limited	7,01,327
47	14-02-2024	Silica Aerogel Powder and Composite sheet	Times Fiberfill Pvt Ltd	7,88,900
48	14-02-2024	D-type Connector Demating Tool	Amphenol Interconnect India Pvt. Ltd	35,000
49	14-02-2024	Piezo-electric Vibration Sensor	Kerala State Electronics Development Corporation Ltd. (KELTRON)	3,04,850
50	25-03-2024	Small sized low power navic receiver	Semi-Conductor Laboratory (SCL)	35,000
51	02-05-2024	SCPC Modem	Defel Technologies Private Limited	8,40,000
52	02-05-2024	SCPC Modem	Tantrayut Telecommunications Private Limited	8,40,000
53	02-05-2024	Rocasin	VEM Technologies Private Limited	2,10,000
54	02-05-2024	Low Density EPDM based Thermal Insulation	Allen Reinforced Plastics Private Limited (ARP)	4,63,379
55	16-07-2024	Black Anodization on Aluminum Alloy	Pushpak Industrial Services, Bengaluru	21,000
56	16-07-2024	Gold Plating on Aluminum and Kovar Material	Pushpak Industrial Services, Bengaluru	5,27,100
57	16-07-2024	Silver Plating on Aluminum Alloy	Pushpak Industrial Services, Bengaluru	4,20,000
58	29-07-2024	compensated alumina (comal)	Bhukhanvala Industries Private Limited, Mumbai	1,16,620
59	29-07-2024	DK-18 Ceramics	Bhukhanvala Industries	35,000

Sl No	Year	Technology	Transferred to	Fee/revenue earned
			Private Limited, Mumbai	
60	29-07-2024	DK-65 Ceramics	Bhukhanvala Industries Private Limited, Mumbai	92,960
61	29-07-2024	Hot-Pressed Boron Nitride/Silica Composites	Bhukhanvala Industries Private Limited, Mumbai	7,28,292
62	29-07-2024	Hot-Pressed Boron Nitride Sintered Components	Bhukhanvala Industries Private Limited, Mumbai	1,72,146
63	29-07-2024	MEMS ACOUSTIC SENSOR	Semi-Conductor Laboratory (SCL)	1,75,252
64	29-07-2024	ROCASIN	Thejo Engineering Ltd	2,10,000
65	29-07-2024	Flameproof Coating (CASPOL)	Asianol Biotech Private Limited, Kolkata	2,10,735
66	29-07-2024	Flameproof Coating (CASPOL)	Crest Speciality Resins Private Limited	2,10,735
67	11-09-2024	Paraffin Actuator Based Hold down and Release Unit	Ananth Technologies Private Limited	7,93,305
68	11-09-2024	Two-Way MSS Terminal	CLIICXNET India Private Limited	4,75,020
69	11-09-2024	Black Anodizing and Chromatic Technology	Prism Circuitronics Private Limited	21,000
70	20-09-2024	HTPB	Anabond Limited	33,45,300
71	20-09-2024	Guanidinium Azotetrazolate (GZT)	Salvo Industries Pvt. Ltd.	3,50,000
72	20-09-2024	Chemical Formulation of Stable, Low build Electroless Copper Concentrate for High Reliability PTH INTERCONNECTIONS	Micropack Pvt Ltd	50,290
73	20-09-2024	Incremental Burst	Astra Microwave Products	3,10,737

Sl No	Year	Technology	Transferred to	Fee/revenue earned
		Demodulator	Limited	
74	20-09-2024	Incremental SCPC Modem	Astra Microwave Products Limited	2,92,504
75	16-01-2025	PMC-30	Atul Limited	35,000
76	16-01-2025	SESCO-125	Atul Limited	70,000
77	16-01-2025	CV-CC Solar Array Simulator	Azista Industries Private Limited	3,51,024
78	16-01-2025	ADBOND EPG 2601M	Pidilite Industries Ltd	70,000
79	27-02-2025	Two-way MSS Terminal	Naval Science and Technological Laboratory (NSTL)	7,80,390
80	26-03-2025	Two-way MSS Terminal	Asnaviram Networks Pvt Ltd	4,75,020
81	26-03-2025	MiniSAR: X band Airborne SAR	Solar Defence and Aerospace Limited, Nagpur	52,60,080
82	26-03-2025	Rocasin	Vajra Rubber Products PVT LTD	2,10,000
83	02-07-2025	Portable Bathymetry	Jalkruti Water Solutions Pvt Ltd, Gandhinagar	3,15,301
84	02-07-2025	Geospatial Pest Forewarning System	Amnex Info technologies Private Limited	87,242
85	02-07-2025	Semi Physical Crop Yield Model	Amnex Info technologies Private Limited	9,28,064
86	02-07-2025	Triband (S, X, Ka) Antenna Dual Circularly	Avantel Limited, Vishakhapatnam	89,66,472
87	02-07-2025	Design of Ku/C/L and S-band Cassegrain Feed	Avantel Limited, Vishakhapatnam	17,26,760
88	02-07-2025	Navic Messaging and Positioning Receiver	Avantel Limited, Vishakhapatnam	0

Sl No	Year	Technology	Transferred to	Fee/revenue earned
89	02-07-2025	Flameproofing Coating – CASPOL	Ramdev Resins Pvt Ltd, Kalol	2,10,735
90	02-07-2025	Ceramic Servo Accelerometer (CSA)	Zetatek Technologies Pvt. Ltd., Hyderbad	53,68,300
91	02-07-2025	ISRO Laser Gyro (ILG)	Zetatek Technologies Pvt. Ltd., Hyderbad	1,87,66,184
92	02-07-2025	Tri-axis Antenna Control Servo Sysytem	Jisnu Communications Pvt Ltd, Hyderabad	0
93	02-07-2025	Triband (S, X, Ka) Antenna LEO Staellite auto Tracking	Jisnu Communications Pvt Ltd, Hyderabad	0
94	26-08-2025	Film Adhesives EFA-1753 and EFA-1752	Azista Composites Private Limited	7,25,410
95	26-08-2025	Low Temperature Co-Fired Ceramic (LTCC) Multi Chip Module technology	VoltixSemicon Private Limited	19,82,365
96	26-08-2025	Anodization of 3D Printed AI-10Si-Mg alloy	Pushpak Aerospace India Private Limited	5,03,266
97	26-08-2025	HMC 30W DC-DC Converter	Ananth Technologies Pvt Ltd	11,89,146
98	26-08-2025	RTV Silicone Single Part Adhesive, SILCEM R9	Cerst Speciality Resins Private Limited	2,89,100
99	09-09-2025	HMC 30W DC-DC Converter	Rakon Indian Pvt Ltd	16,98,780
100	10-09-2025	SSLV Technology	HAL	5,11,00,00,000

RECOMMENDATIONS/OBSERVATIONS-AT A GLANCE

BUDGETARY ALLOCATION FOR THE DEPARTMENT OF SPACE IN THE UNION BUDGET 2026-27:

The Committee notes that the Department of Space had projected an outlay of ₹15,604.80 crore to the Ministry of Finance under Demand No. 95 for the financial year 2026–27. However, the Ministry of Finance approved an outlay of ₹13,705.63 crore, which is about 87.82% of the projected amount. The Committee is of the view that the pattern and extent of fund utilization during the current financial year significantly influence the allocation made in the subsequent year. A careful examination of the Department's expenditure pattern over the years indicates that it has not been able to fully utilize the outlays sanctioned to it. For instance, the Department was allocated an outlay of ₹13,416.20 crore at the BE stage in 2025–26, which was subsequently revised downward to ₹12,448.60 crore at the RE stage. Further, the Department has been able to incur an expenditure of only ₹9,739.72 crore up to 31st January, 2026. Slow pace of expenditure appears to have contributed to the reduction in allocation made to the Department in BE 2026–27 vis-à-vis the projected outlay. In view of the above, the Committee urges the Department to take necessary measures to improve the rate of budget utilization and strive to achieve full utilization of the allocated funds in the coming financial year, so as to avoid any reduction in future budgetary allocations. (Para 12)

DETAILED HEAD-WISE ALLOCATION OF BUDGET 2026-27

The Committee observes that the outlay allocated for ISRO Headquarters and IN-SPACe under the 'Establishment Expenditure' head, INSAT satellite systems under the 'Central Sector Schemes' head, and IIST, NESAC, NARL, and PRL under the 'Other Central Sector Expenditure' head is lower compared to the allocations made in BE 2025–26. The Committee further observes that the allocations for IN-SPACe and INSAT systems in BE 2026–27 are, in fact, lower than the levels provided in RE 2025–26. Given the significant role of the Department of Space (DoS) in advancing the country's space capabilities and supporting national development, the Committee underscores the need to ensure adequate financial support so that these institutions can effectively discharge their mandates. The Committee particularly emphasizes the importance of the INSAT satellite systems in providing critical communication, broadcasting, meteorological, and disaster management services. Any shortage of funds may adversely affect the maintenance, upgradation, and expansion of these vital systems. In view of the above, the Committee recommends that additional funds may be provided to the Department of Space at the Revised Estimates (RE) stage to ensure that the concerned institutions and programmes are able to function efficiently and fulfill their strategic and developmental objectives. (Para 19)

ASSESSMENT OF THE PATTERN OF BUDGET UTILIZATION BY THE DEPARTMENT OF SPACE

The Committee observes that the Department of Space has utilized 78.23 per cent of the outlay allocated at the Revised Estimates (RE) stage for 2025–26 as on 31st January 2026. The Committee notes that the Department of Space has historically maintained a commendable record of fund utilization, generally in the range of 96–98 per cent over the years. The Committee is hopeful that the Department of Space will ensure full utilization of the funds allocated to it in the ongoing financial year as well. (Para 21)

ASSESSMENT OF THE PATTERN OF BUDGET UTILIZATION BY INSTITUTIONS UNDER THE DEPARTMENT OF SPACE

The Committee underscores that fiscal discipline and prudent financial management are essential for ensuring that public funds are utilized efficiently, transparently, and in a manner that delivers the intended outcomes. Proper planning and timely expenditure not only facilitate smooth implementation of programmes and projects but also prevent delays, cost escalations, and bunching of expenditure towards the end of the financial year. The Committee notes with concern that institutions such as HSFC, IIRS, ISTRAC, LEOS, MCF, and IN-SPACe have not been able to utilize 75 per cent of the funds allocated to them within the stipulated period. Such trends, if not addressed in time, may affect the pace of programme implementation and the effective delivery of institutional mandates. The Committee is of the view that optimal utilization of funds is as important as the allocation of funds itself. Accordingly, the Committee recommends that the Department of Space strengthen its monitoring mechanisms and closely review the spending patterns of these institutions on a quarterly basis. The Department should ensure timely and proportionate disbursement of funds, identify the reasons for slower expenditure, and take corrective measures to improve the pace and efficiency of utilization.

(Para 23)

VACANCIES

The Committee notes that the Department of Space has been facing a significant shortage of human resources owing to the accumulation of vacancies from 2020–21 onwards. The Committee recognizes that human resources constitute a critical component in the successful planning, execution, and management of complex space missions and programmes undertaken by the Department. Adequate availability of skilled scientific, technical, and administrative personnel is therefore essential for sustaining the momentum of the national space programme and achieving the strategic objectives of the Department of Space. While taking cognizance of the measures initiated by the Department to address the issue, including the re-initiation of recruitment processes, adoption of GATE score-based recruitment, conduct of Computer-Based Tests, and establishment of mechanisms for periodic review of recruitment actions, the Committee notes the Department's commitment to fill 2,383 vacant posts by December 2026. The Committee recommends that the Department of Space make concerted efforts to adhere to the proposed timelines and ensure that the identified vacancies are filled within the stipulated period. The Committee further urges the Department to take mission-mode measures to address the backlog of vacancies, including the remaining posts arising from cadre restructuring and other categories to ensure that the Department and its Centres/Units are adequately staffed to effectively discharge their responsibilities and support the growing demands of India's space sector.

(Para 28)

SPACE VISION 2047

The Committee notes that under India's Space Vision 2047, key programmes such as the Gaganyaan Mission, Bharatiya Antariksh Station (BAS) and the Next Generation Launch Vehicle (NGLV) represent major milestones for advancing India's capabilities in human spaceflight, space infrastructure and next-generation launch systems. These initiatives are critical for strengthening India's technological self-reliance, expanding opportunities for scientific research in microgravity, and enhancing the country's position as a leading global space power. The Committee notes the reasons advanced by the Department for slow utilization of funds for the Gaganyaan mission and hopes that the Department will be able to

overcome these obstacles without compromising the crew safety. The Committee hopes that the relatively slow pace of expenditure will not adversely impact the timely progress of these strategically important missions. The Committee, therefore, recommends the Department of Space to ensure optimal utilization of funds and make concerted efforts to adhere to the proposed timelines so that these missions are implemented without delays and the objectives of India's Space Vision 2047 are achieved in a timely and efficient manner.

(Para 38)

LUNAR AND INTER PLANETARY MISSIONS

The Committee notes the significance of India's forthcoming space missions, namely Chandrayaan-4, Chandrayaan-5 and the Venus Orbiter Mission. These missions represent important milestones in India's expanding space exploration programme and are expected to substantially enhance the country's scientific capabilities in planetary exploration. The Committee is of the view that successful execution of these missions will not only deepen scientific understanding of the Moon and Venus, but will also significantly strengthen India's standing in the global space community and further position the country as an emerging leader in space science and planetary exploration among the comity of nations. At the same time, the Committee notes with concern the slow pace of expenditure under these missions so far. In the case of Chandrayaan-4, an allocation of ₹150 crore was made at the Budget Estimate (BE) stage for the financial year 2025–26, which was subsequently revised downward to ₹21 crore at the Revised Estimate (RE) stage, while the actual expenditure incurred up to 31st January 2026 stood at ₹34.60 crore. Similarly, under Chandrayaan-5, an allocation of ₹2 crore was made at the BE stage for 2025–26, which was later revised upward to ₹14 crore at the RE stage; however, the actual expenditure incurred as of 31st January 2026 was only ₹0.58 crore. With regard to the Venus Orbiter Mission, the Committee notes that for the financial year 2024–25, the BE allocation of ₹1 crore was revised to ₹2.10 crore at the RE stage, but no expenditure was incurred during the year. Further, in the financial year 2025–26, the BE allocation of ₹50 crore was revised downward to ₹29.50 crore, while the actual expenditure incurred up to 31st January 2026 was ₹5.12 crore. The Committee is apprehensive that, if the pace of expenditure and project implementation continues at this level, the timely accomplishment of these missions as per the proposed timelines may become challenging. At the same time, the Committee agrees with the Department's submission that scientific missions of this nature are inherently iterative in character and are often constrained by several technical and operational factors, including design finalization, availability of specialized components, vendor readiness and mission configuration requirements. The Committee is of the view that these missions are presently transitioning from the initiation phase to the execution phase, and therefore the cash flow requirements are likely to increase substantially in the coming year. In view of the strategic and scientific importance of these missions, the Committee strongly recommends that the Department take proactive steps to improve the pace of fund utilization and project implementation. The Committee further recommends that the Department institute robust institutional mechanisms for periodic monitoring and review of the progress of these missions at appropriate levels. **(Para 53)**

NAVIGATION WITH INDIAN CONSTELLATION (NavIC)

The Committee notes the strategic significance of the NavIC system, India's indigenously developed regional satellite-based navigation network. The Committee emphasizes that expanding the coverage, reliability and adoption of NavIC in the near future will be vital for enhancing India's technological self-reliance and strategic autonomy. However, the Committee

notes with concern that out of the total 12 satellites envisaged under the NavIC constellation, only 8 satellites are currently functional, and some of the satellites are unable to provide positioning, navigation and timing services due to malfunctioning of onboard atomic clocks. The Committee appreciates that ISRO has successfully developed indigenous atomic clocks and recommends complete switchover to indigenous atomic clocks at the earliest to minimize dependence on foreign vendors. The Committee urges the Department to ensure the timely replacement of non-functional satellites and to adopt appropriate measures for improving the reliability and operational readiness of the NavIC constellation so that this strategic national asset can function at its full potential. The Committee also recommends the Government to provide adequate funds to the Department of Space to achieve these objectives.

(Para 58)

LAUNCH PAD INFRASTRUCTURE

The Committee notes that robust launch pad infrastructure forms the backbone of any nation's space transportation capability. The ability to conduct launches depends significantly on the availability of launch facilities. In this regard, the Committee appreciates the initiatives taken by the Department of Space in expanding the country's launch infrastructure, including the establishment of the Third Launch Pad at Satish Dhawan Space Centre and the development of the SSLV Launch Complex at Kulasekarapattinam. At the same time, the Committee observes that the existing launchpad infrastructure at Sriharikota comprises the First Launch Pad, which is nearly three decades old, and the Second Launch Pad, which has been in operation for over two decades. While these facilities have served the nation well, the Committee notes that India's space transportation system currently remains largely dependent on these two launch pads. Given the growing scale and complexity of India's space programme, the Committee is of the view that relying on a limited number of launch pads may pose operational risks. In this context, the Committee also draws attention to past instances such as the failure of launch infrastructure at the Baikonur Cosmodrome, which had a significant impact on Russian launch operations and highlighted the vulnerabilities associated with dependence on limited launch facilities. The Committee therefore considers it imperative that India proactively strengthen and diversify its launch infrastructure. The Committee notes that the proposed Third Launch Pad at Sriharikota is expected to become operational by 2029–30 and will significantly augment the country's launch capabilities. However, considering the expanding scope of India's space activities, the increasing demand for satellite launches, and emerging missions including human spaceflight and planetary exploration, the Committee is of the view that the country will require additional launch infrastructure in the long run. The Committee therefore recommends the Department to assess whether the existing and upcoming infrastructure, including the Third Launch Pad and the SSLV Launch Complex at Kulasekarapattinam, will be sufficient to meet India's future launch requirements. Further, considering the long gestation period involved in the planning and construction of launch pads and associated facilities, the Committee recommends the Department to undertake a comprehensive long-term assessment of the number of launch pads and spaceports that India may require over the next thirty years, keeping in view the ageing launch pad infrastructure, increasing launch frequency and the country's growing space ambitions. Further, the Committee strongly recommends the Department to take all necessary steps to ensure the timely completion and operationalization of the Third Launch Pad at Sriharikota and the SSLV Launch Complex at Kulasekarapattinam. (Para 68)

PROPULSION TECHNOLOGY

The Committee notes that the development of semi-cryogenic propulsion technology is of considerable strategic importance for India's space programme. The Committee recalls that

India had faced significant challenges in the past in accessing critical propulsion technologies, particularly during the early stages of the development of cryogenic engines, when international technology transfer restrictions necessitated the pursuit of indigenous capabilities. In this context, achieving self-reliance in semi-cryogenic propulsion assumes great importance for strengthening the country's launch vehicle capabilities. The Committee further observes that several major space-faring nations rely on semi-cryogenic engines for high-thrust booster stages due to their operational efficiency, higher propellant density and suitability for heavy-lift launch vehicles. The successful development of such engines would enhance India's ability to launch heavier payloads, support next-generation launch vehicles and expand the scope of future missions. In view of the strategic, technological and operational advantages associated with this capability, the Committee recommends the Department to accord high priority to the development of the semi-cryogenic engine and expedite efforts to realise this critical technology at the earliest. (Para 71)

INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY (IIST)

The Committee recognizes the significant role played by the Indian Institute of Space Science and Technology (IIST) in advancing education, research, and human resource development in the space sector. Since its establishment, the institute has contributed meaningfully to strengthening the national space programme and nurturing skilled professionals for the Department of Space and allied organizations. The Committee is of the view that conferment of INI designation would also strengthen IIST's global visibility and foster deeper collaborations with leading international space agencies and research institutions, while allowing the institute greater operational flexibility, including the establishment of off-campus centres and continued participation in the JEE Advanced admission framework. In view of these strategic advantages, the Committee strongly recommends that INI status be granted to IIST at the earliest. (Para 78)

INSTITUTIONAL ARCHITECTURE OF INDIA'S SPACE SECTOR

The Committee commends the contributions made by Antrix Corporation Limited and New Space India Limited (NSIL) towards the growth of India's space sector and the development of a vibrant space economy. However, the Committee notes with serious concern the sharp decline in the turnover of Antrix Corporation Limited, which has decreased from about ₹654 crore in 2020–21 to ₹76.77 crore in 2024–25. The Committee also observes that the turnover of NSIL has witnessed a declining trend over the years, particularly in respect of revenue generated from launch services. The Committee has been given to understand that the Internal and Extra Budgetary Resources (IEBR) mobilised by Antrix and NSIL are retained by these entities to fund capital expenditure and support various development projects. In this context, the Committee emphasises that higher revenue generation would directly translate into greater availability of funds for investment in capital infrastructure and further development of the space sector. The Committee, therefore, recommends that the Department should take proactive and concerted steps to enhance resource mobilisation by these entities. This may include pursuing commercialization opportunities more vigorously, strengthening marketing strategies, and exploring new domestic and international markets for launch services, satellite services, and other space-based applications, so as to augment revenue generation and support the continued expansion of India's space economy. (Para 88)

SPACE LAW

The Committee notes that, at present, space-related activities in the country are not governed by a comprehensive legislative framework and are largely guided by policy documents, vision statements, and mission guidelines. In view of the rapid expansion of space activities in recent years, their increasing strategic and security implications, and the growing participation of Non-Governmental Entities (NGEs) in the space sector, the Committee is of the view that there is a clear and pressing need for a comprehensive legal framework to regulate, authorize, and oversee space activities in the country. The Committee, therefore, welcomes the initiative of the Department of Space in drafting a Bill to regulate space activities and expects that the proposed legislation will provide a robust, transparent, and forward-looking framework for the orderly development of the space sector in India. At the same time, the Committee observes that the authorization mechanism under the Indian Space Policy, 2023 currently applies to Government entities, including ISRO and other agencies functioning under the Department of Space. The Committee notes that these agencies already operate under the administrative oversight of the Department of Space and their activities are subject to approval by the Department as well as the Space Commission. In such a scenario, the requirement for these entities to obtain authorization from IN-SPACe, an institution that also functions under the Department of Space, may result in an additional procedural layer within the Government system. Keeping in view the principle of *"Minimum Government, Maximum Governance"*, the Committee is of the considered opinion that the authorization mechanism should primarily be intended to regulate and facilitate the activities of Non-Governmental Entities entering the space sector. The Committee, therefore, recommends that the requirement of authorization for ISRO and other agencies functioning under the Department of Space may be gradually dispensed with. The Committee further recommends that an appropriate provision to this effect may be incorporated in the proposed Space Activities Bill so as to streamline governance, avoid procedural duplication, and ensure greater administrative efficiency within the space sector.

(Para 93)

TECHNOLOGY TRANSFER AND PRICING IN INDIA'S SPACE SECTOR

The Committee expresses concern over the transfer of technologies in the space sector at disproportionately low prices relative to their commercial potential. It has been observed that technologies are often transferred to private players at undervalued rates, allowing these partners to earn significant profits while the originating institutes receive only a marginal share of the value created. Furthermore, there is no credible mechanism to verify whether the benefits of low-cost technology transfers are being passed on to the intended target users for whom the technologies were developed. In view of this, the Committee recommends that the Department of Space should consider adopting a more competitive and market-aligned pricing framework for technology transfer. Licensing fees should appropriately reflect the true commercial value, uniqueness, and societal impact of technologies developed through public funding. Additionally, the Committee recommends the establishment of clear guidelines to determine technology transfer costs, and that the Standing Committee constituted by IN-SPACe for evaluating technology fees should calculate fees in accordance with these guidelines. To ensure transparency and accountability, the Committee further recommends that all technology transfer agreements be subject to periodic third-party audits. (Para 96)

START-UPS IN THE SPACE SECTOR

The Committee appreciates the initiatives taken by the Government of India to promote start-ups in the space sector. The Committee also notes the rapid emergence of start-ups in

India's space ecosystem, which is a positive development for the growth and diversification of the sector. The Committee observes that ISRO continues to rely on foreign vendors for certain critical components and technologies. For instance, the atomic clocks used in NAVIC system were imported from a foreign vendor and their malfunctioning rendered some satellites defunct making them unable to provide the intended positioning, navigation, and timing services. Additionally, scientific missions are often delayed due to supply chain bottlenecks, highlighting vulnerabilities in the domestic space manufacturing ecosystem. In this context, the Committee is of the view that start-ups should be actively leveraged to bridge these critical gaps and complement ISRO's capabilities. Encouraging diversification in the domestic space industry is crucial to reduce dependence on foreign suppliers. Therefore, the Committee recommends the Department of Space to identify areas where the country is still reliant on foreign vendors and proactively support start-ups in these domains through funding, technology transfer, and market access. (Para 99)

APPLICATIONS OF SPACE SCIENCE AND TECHNOLOGY

The Committee notes with concern that forest cover in India is under pressure and requires closer monitoring. At present, the Forest Survey of India publishes the biennial India State of Forest Report which assesses the extent of forest and tree cover across the country. The Committee emphasizes that forests play a crucial role not only in carbon sequestration and climate mitigation but also in supporting the country's economy and ecological balance. In view of their strategic and environmental importance, the Committee feels that forest cover monitoring should be carried out more frequently, preferably at least on a quarterly basis, rather than biennially. The Committee appreciates that the Department of Space has developed a web-based Forest Loss Information System for the North Eastern Region, which detects annual changes in forest cover using satellite imagery. Additionally, the Forest Resources Analysis and Monitoring System (FRAMS) implemented for the Government of Manipur generates deforestation alerts on a monthly basis using time-series satellite data. These initiatives represent important steps towards more frequent monitoring of forest resources. The Committee observes that Brazil monitors its forest cover, particularly in the Amazon region, on a daily basis through advanced satellite systems. The National Institute for Space Research (INPE), Brazil operates the DETER system (System for Alerts of Deforestation and Degradation) which provides near real-time, daily alerts on deforestation and forest degradation, enabling immediate action against illegal activities. In this context, the Committee recommends ISRO to examine the functioning of such real-time monitoring systems, collaborate with Forest Survey of India and the Ministry of Environment, Forest and Climate Change, and develop a similar operational system for India. (Para 101)