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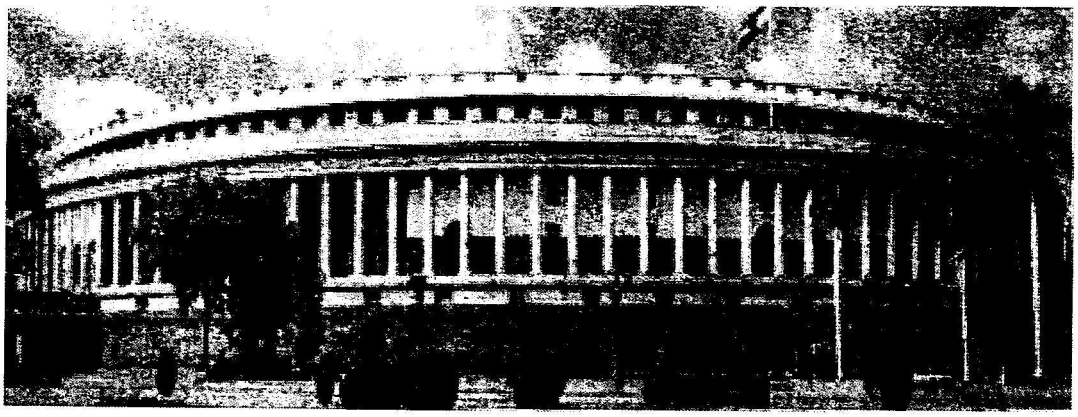
GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

"SPACE IN PARLIAMENT"



BUDGET SESSION OF PARLIAMENT 2022
(FEBRUARY TO APRIL, 2022)

COMPILATION OF REPLIES GIVEN IN PARLIAMENT DURING 2022

Government of India
Department of Space
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PARLIAMENT QUESTIONS – BUDGET SESSION OF PARLIAMENT 2022
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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 11

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 02, 2022

DIRECTORATE OF IN-SPACe

11. SHRI PINAKI MISRA:

Will the PRIME MINISTER be pleased to state:

(a) the details of the current structure and directorate of IN-SPACe including the experts appointed therein;

(b) whether the Government has finalised any rules/law on structure, functioning and process of IN-SPACe and if so, the details thereof and if not, the reasons therefor;

(c) the number of applications received, approved and pending before IN-SPACe for authorizing space activities of Non-Governmental Private Entities (NGPEs) and sharing of technology and facilities of DoS by NGPEs since its inception; and

(d) the details of the NGPEs which have been allowed and details of the technology and facilities of DoS approved to be shared?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) The Government has approved the composition of Indian National Space Promotion and Authorization Centre (IN-SPACe) Board consisting of Chairperson and 11 Members.

Directorates forming part of the IN-SPACe include Co-ordination Directorate, Technical Directorate, Safety & Security Directorate, Legal Directorate and Monitoring & Promotion Directorate.

(b) Space Activities Legislation which provides the structure, functioning and process for IN-SPACe is being drafted duly factoring in the public consultations and the Space sector reforms.

(c) The applications received by IN-SPACe with respect to authorizing the space activities to NGPEs are 13 and sharing of technology and facilities of DOS to NGPEs are 15 and their applications are being processed for further action.

(d) All the proposals of NGPEs are at various stages of approval. The NGPEs who have submitted the applications are working in the areas of building and launching of launch vehicles, building, owning and operating satellites, providing satellite based services, establishing ground segments, research partnerships and providing mission services.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 59

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 02, 2022

LAUNCHING OF CHANDRAYAAN-III

59. SHRI RAVNEET SINGH BITTU:

SHRI THIRUNAVUKKARASAR SU

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that there is a delay in the launching of Chandrayaan 3 and if so, the details thereof;

(b) the reasons for the delay in the Chandrayaan 3 mission and the likely time by which the mission will be accomplished including the functions of the mission.

(c) the details of the various space missions delayed since the last three years, year-wise; and

(d) the future plan of the Government in this regard for the next three years, year-wise?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

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(a) & (b)

Based on the learnings from Chandrayaan-2 and suggestions made by the national level experts, the realization of

Chandrayaan-3 is in progress. Many related hardware and their special tests are successfully completed. The Launch is scheduled for August 2022.

(c) Several ongoing missions were impacted due to the COVID-19 pandemic. Also, reprioritization of projects has taken place in the back drop of Space Sector reforms and newly introduced demand driven models. The following missions were realized in last 3 years.

List of Satellites launched in last 3 years time frame

Satellite Name	Launch Date
EOS-03	Aug 12, 2021
Amazonia-1	Feb 28, 2021
Satish Dhawan SAT (SDSAT)	Feb 28, 2021
UNITYsat	Feb 28, 2021
CMS-01	Dec 17, 2020
EOS-01	Nov 07, 2020
GSAT-30	Jan 17, 2020
RISAT-2BR1	Dec 11, 2019
Cartosat-3	Nov 27, 2019
Chandrayaan-2	Jul 22, 2019
RISAT-2B	May 22, 2019
EMISAT	Apr 01, 2019
GSAT-31	Feb 06, 2019

Microsat-R	Jan 24, 2019
Kalamsat-V2	Jan 24, 2019

(d) With the unlocking space sector reforms, the Department of Space is in the process of reviewing the future requirements of satellites based on the demand driven model. Discussions with the User ministries and probable customers are underway.

Number of missions planned during 2022 (Jan to Dec'22) are 19 viz., 08 Launch Vehicle Missions, 07 Spacecraft Missions and 04 Technology Demonstrator Missions.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 216

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 02, 2022

SPACE DEBRIS

216. SHRI PINAKI MISRA:

Will the PRIME MINISTER be pleased to state:

(a) whether the ISRO has identified the number and details of space debris created by anti-satellite weapon test conducted by Russia on November 15, 2021;

(b) if so, the details thereof;

(c) whether the tests conducted by Russia has posed risks to civilian space programmes or space situational awareness for satellites of India and led to change of their time or path; and

(d) if so, the details about those risks and change of the already fixed plan/path including the timeline?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Yes Sir. Currently, ISRO uses information from the public domain for data, specifically SpaceTrack website of USSPACECOM, to

identify the number and details of space debris created by anti-satellite weapon test conducted by Russia.

(b) The Russian anti-satellite test created 1251 pieces of trackable debris at an altitude of 450-500 km as reported by SpaceTrack. As of today there are 1142 catalogued objects still in orbit whereas the remaining 109 have decayed.

(c) & (d)

Anti-satellite weapon tests and fragmentation events in space, pose threat to satellites. As of now there are no threats identified due to the Russian fragments to India space assets and no collision avoidance maneuvers were planned to avoid collisions threats from these fragments.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1213

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 09, 2022

PRIVATE PLAYER IN ISRO

1213. SHRIMATI RITA BAHUGUNA JOSHI:

Will the PRIME MINISTER be pleased to state:

(a) the details of the steps taken by the Government to bring private players on board to get their participation in the Space activities of ISRO;

(b) whether the Government plans to allow FDI in the near future to boost the investment in the space sector by the foreign players;

(c) if so, the details thereof; and

(d) if not, the reasons thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Government of India has announced reforms in June, 2020, in the space sector towards enabling the private players to provide end to end services and subsequently the following steps were taken:

I. A national level autonomous Nodal Agency namely Indian National Space Promotion and Authorization Centre (IN-SPACe) under DOS has been created for promoting,

handholding, authorising and licensing private players to carry out Space Activities.

II. Access to ISRO facilities and expertise are extended to private entities to support their space activities. Apart from this ISRO will also nurture Indian space industries by sharing its experiences on quality and reliability protocols, documentation, testing procedures etc.

III. Announcement of Opportunities are being done offering challenges in new domains of space technology.

IV. New Space India Ltd (NSIL), the CPSE under DOS will transfer the matured technologies developed by ISRO to Indian industries.

V. To facilitate private sector participation in Space activities, the existing policies in space domain is being revised and new policies are being drafted to address policy framework for various areas such as SpaceCom, Remote Sensing, Technology Transfer, Navigation, Space Transportation, Space exploration and Space Situational Awareness.

VI. In order to address the necessary legal framework, the department is also in the process of enacting a National legislation. The draft Space Activities Bill has completed Public and Legal consultations and will be processed for further approvals for inter-ministerial consultations.

(b) Yes Sir.

(c) FDI policy of Government of India already allows for FDI in certain sectors of space domain. In view of the reforms, allowing FDI in other sectors is under consideration.

(d) Does not arise.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1293

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 09, 2022

PRIVATE PLAYERS IN SPACE

1293. SHRI PINAKI MISRA:

Will the PRIME MINISTER be pleased to state:

(a) the number of private players in space sector registered under MSMEs and startups, State/UT wise;

(b) whether the Ministry has plans to develop policy and planning for the development of MSMEs and startups in space sector and if so, the details thereof; and

(c) whether the Government plans to procure goods produced and services rendered by MSMEs and if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Department of Space (DOS) does not register MSMEs and startups. However, start-ups are registered with Startup India programme under DPIIT. Around 75 start-ups are shown under space technology category in the Startup India portal. But these

numbers are not exhaustive, as some of the startups registered under other categories are also involved in the space domain.

(b) Yes, to facilitate private sector participation in Space activities, DOS is revising the existing policies in space domain and new policy framework is being drafted to address various space sectors such as SpaceCom, Remote Sensing, Technology Transfer, Navigation, Space Transportation, Space exploration and Space Situational Awareness. Provisions are being factored in the above policy framework for the development of private sector including MSMEs and startups in space sector.

(c) DOS follows the Government guidelines for MSME while engaging in procurement process for its space programmes.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 1352

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 09, 2022

SELF RELIANCE IN SPACE SECTOR

1352. SHRI JAGDAMBIKA PAL:

Will the PRIME MINISTER be pleased to state:

(a) the steps taken by the Indian Space Research Organisation (ISRO) to work towards making India self-reliant and a global leader in the space arena;

(b) the details of the number of research papers published by the Indian Space Scientist using the data collected from the Hubble Space Telescope;

(c) whether ISRO has any plans or is working to develop an Indian Space Telescope; and

(d) if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) The following initiatives are taken to make India the global leader in space science and technology:

I. Technology development projects are going on in ISRO centres spanning the areas of scientific instrumentation, communication, navigation, remote sensing etc.

II. Disruptive technologies based on quantum mechanical principle which includes satellite based quantum communication, quantum radar have been initiated.

III. Initiatives have been taken for the exploration of space weather, the sun, the moon and the other planets as well as astronomical sources.

IV. A decadal plan is under preparation covering scientific and technological development for future space missions.

(b) Indian scientists have authored 540 publications in refereed journals using Hubble data.

(c) ISRO has already realized X-ray and Visible/ Ultra Violet telescope. In the coming years ISRO has plans to develop space telescopes dedicated for UV and visible/IR astronomy.

(d) The planned UV telescope will be made up of a 1 meter mirror and will provide the deepest images in UV.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 2375

TO BE ANSWERED ON WEDNESDAY, MARCH 16, 2022

LAUNCH OF SATELLITE EOS-4

2375. SHRI RAVNEET SINGH BITTU:

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that the Indian Space Research Organisation (ISRO) has recently launched an earth observation satellite EOS-4 along with two other scientific satellites;

(b) if so, the details thereof;

(c) the details of the likely benefits to be accrued for agriculture, forestry, flood mapping, soil moisture and hydrology by launching of these satellites;

(d) the details of delays, if any, in all the big ticket missions and other routine launches by ISRO scheduled during the last two years along with the reasons therefor; and

(e) the details of the steps taken by the Government to ensure the early operationalisation of all delayed space missions along with the schedule of future satellite launches in the next two years?

(15)

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a)&(b)

Yes Sir, ISRO has successfully launched the earth observation satellite EOS-04 onboard PSLV-C52 on 14th February 2022 at 05:59 hrs IST from Satish Dhawan Space Centre, Sriharikota along with INS-2TD & INSPIRESat-1 as co-passengers. The Satellites were injected into the polar sun synchronous orbit at 524.87 km altitude. EOS-4 is a Synthetic Aperture Radar (SAR) imaging satellite for Earth Observation operating in C-band at 5.4 GHz frequency for all weather & day/night imaging. INS-2TD is the first satellite of the 2nd generation nano-satellite intended to demonstrate indigenously developed Nano systems for in-orbit performance. INSPIRESat-1 is a student satellite of the class 9U jointly developed by Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram, India and Laboratory of Space Physics, University of Colorado, Boulder, the USA.

(c) The data from EOS-4 will be helpful for applications in the domains of agriculture, forestry, flood mapping, soil moisture and hydrology. The likely benefits to be accrued in these domains include assessment of inventory of crops & multiple in-season crop production forecast, early assessment of long duration kharif crops, assessment of forest disturbance &

forest biomass, advisories on crop-water requirements, monitoring of flood-inundated areas, all-season assessment of surface water spread, reservoir capacity, irrigation performance etc.

(d) The big ticket missions and other routine launches by ISRO were badly impacted in the last 2 years due to the prevailing COVID-19 situation in the country. ISRO Centres as well as industries were not fully operational due to imposition of lockdowns and other restrictions at different times in different cities. Further, global and domestic supply chain was disrupted which also impacted the scheduled missions of ISRO. This has resulted in significant delays to key missions including CHANDRAYAAN-3, GAGANYAAN and other routine missions including EOS-4, EOS-6.

(e) ISRO has been trying to compensate for the delays by taking a number of steps that includes prioritisation of resources for key missions such as CHANDRAYAAN-3, GAGANYAAN etc. These efforts have resulted in the recent successful launch of EOS-4 on the PSLV C-52 mission. It is expected that missions including EOS-06, NVS-01 would be successfully completed during the year 2022-23 in addition to other key missions.

For the coming two years, initiatives are also being undertaken for various other prestigious missions that includes ADITYA-L1, Technology Demonstration Satellite, XPOSAT.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 3273

TO BE ANSWERED ON WEDNESDAY, MARCH 23, 2022

REGULATION OF PROJECTS BY ISRO

3273. SHRI SUBBARAYAN K.:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government subscribes to the view that Indian Space Research Organisation (ISRO) should be entrusted with the responsibility of regulation of the projects related to the nation's security and scientific significance;

(b) if so, the measures proposed to be taken by the Government in this regard; and

(c) if not, the reasons therefor?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a), (b) & (c)

The vision of Indian Space Research Organisation (ISRO) is to harness space technology for national development, while pursuing space science research and planetary exploration. Government of India has created the Indian National Space Promotion and Authorization Centre (IN-SPACe) to regulate the space activities in the country.

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O.I.H.

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 3281

TO BE ANSWERED ON WEDNESDAY, MARCH 23, 2022

SPECIAL SPACE PROGRAMMES

3281. SHRI KUNWAR PUSHPENDRA SINGH CHANDEL:
SHRIMATI MALA RAJYA LAXMI SHAH:
Will the PRIME MINISTER be pleased to state:

(a) whether the Government proposes to introduce special space programmes for the development of communication through which high speed communication network can be developed by sending more satellites to space;

(b) if so, whether the Government proposes to collaborate with the private sector for the said purpose; and

(c) if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a), (b) & (c)

In order to meet the communication requirements of the country, three Indian High Throughput Satellites with 25 Gbps capacity are operational for providing broadband connectivity under BharatNet programme to Grampanchayats where adequate Optical Fibre Cable (OFC) connectivity is not available. One more High Throughput Satellite is under realization. Government has opened up space sector for participation of the private players as co-travelers so that they can build, own and operate satellites to meet the growing demands for satellite capacity in the country.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 3328

TO BE ANSWERED ON WEDNESDAY, MARCH 23, 2022

PROTECTING INDIA'S INTEREST IN SPACE

3328. SHRI PARVESH SAHIB SINGH VERMA:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government is planning on establishing a dedicated military force for the purpose of protecting India's interests in Space and if so, the details thereof; and

(b) if not, the current provisions and international agreements for the protection of Indian satellites and other equipment around the orbit?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) & (b)

Government of India through Department of Space has been proactive in protecting and augmenting India's interests in

space by developing all-round capabilities in the domains of space transportation, infrastructure and applications.

Further, for protection of Indian satellites and other equipment in orbit, ISRO actively participates in all international efforts to contain the space debris growth for the long term sustainability of outer space.

ISRO is an active member of Inter Agency Space Debris Coordination Committee(IDAC), IAF Space Debris Working Group, IAA Space Traffic Management Working Group, ISO Space Debris Working Group and UNCOPUOS long term sustainability Working Group – all international organisations contributing to the space debris studies and space situational awareness.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 3417

TO BE ANSWERED ON WEDNESDAY, MARCH 23, 2022

MISSION GAGANYAAN

3417. SHRIMATI SAJDA AHMED:

Will the PRIME MINISTER be pleased to state:

(a) the status of mission Gaganyaan;

(b) whether the mission is suffering from financial necessity;

(c) whether the Government has engaged private entities to handle the mission work;

(d) whether the Government has encouraged startups to join hand in mission works; and

(e) if so, the details therof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) The current status of Gaganyaan programme is as follows:

I. An Astronaut training facility has been commissioned in Bengaluru. Training activities are progressing well at the newly commissioned Astronaut training facility.

II. The design of all systems and sub-systems for Gaganyaan has been completed. Realisation of the same is in different stages of progress.

III. Long duration qualification test of human rated cryogenic engine and First phase testing of human rated VIKAS Engine completed. First phase of demonstration tests for Gaganyaan service module propulsion system completed.

IV. Proof of concept demonstration for ground network with service providers completed. Construction of integration facility for Orbital module preparation is nearing completion.

V. The MoU, Contracts and Implementation Arrangements (IA) related activities with both national and international agencies are progressing well. The design of various human centric products has been completed and various prototypes are under realization.

VI. Receipt of Gaganyaan deliverables against contracts with M/s. Glavkosmos (Russia) and CNES (France) commenced.

VII. Roles and responsibility for crew recovery operations and rehearsals finalized. Detailed operational requirements for nominal missions scenarios worked out.

VIII. The activities related to development of microgravity experiments have commenced. The conceptual design for experiments is under review.

(b) No, Sir.

(c), (d) & (e)

Yes, Sir. The government is encouraging the private sector and start-ups for various Gaganyaan activities such as hardware realization, components supply, health monitoring devices, Virtual reality simulators etc.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 4413

TO BE ANSWERED ON WEDNESDAY, MARCH 30, 2022

ISRO ASSETS

4413. SHRI JAYADEV GALLA:

Will the PRIME MINISTER be pleased to state:

(a) whether New Space India Limited (NSIL) is leasing out ISRO assets to private companies;

(b) if so, the details of the assets that have been leased out by NSIL till date to private sector companies;

(c) if not, the reasons therefor; and

(d) the steps taken to ensure that India's sovereignty is not compromised by leasing ISRO assets to private companies by NSIL?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a), (b) & (c)

Till date, NewSpace India Limited (NSIL) has not leased out any ISRO assets to private companies. However, NSIL is in discussions with Indian companies especially with regard to

"production of PSLV through Indian Industry" wherein the requirement of utilizing some specific ISRO's assets/facilities is envisaged while they undertake this task.

(d) NSIL, before leasing ISRO's assets to Private Companies would carry out necessary due diligence process through its administrative Department, to ensure India's sovereignty is not compromised.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 4446

TO BE ANSWERED ON WEDNESDAY, MARCH 30, 2022

OBSERVATION SATELLITE EOS-4

4446. SHRI SANJAY SADASHIVRAO MANDLIK:

SHRI RAVINDRA KUSHWAHA:

SHRI RAVI KISHAN:

SHRI SUBRAT PATHAK

SHRI MANOJ TIWARI:

SHRI SUDHEER GUPTA:

SHRI PRATAPRAO JADHAV:

SHRI SHRIRANG APPA BARNE:

SHRI DHAIRYASHEEL SAMBHAJIRAO MANE:

Will the PRIME MINISTER be pleased to state:

(a) whether the Indian Space Research Organization (ISRO) has recently launched its observation satellite EOS-04 and two small satellites into orbit;

(b) if so, the aims and objectives of launch of such satellites;

(c) whether the desired objectives/targets have been achieved successfully and if so, the details thereof;

(d) the time in which such a satellite has been made and the total expenditure incurred on the development of such satellite along with the cost of its launch;

(e) whether ISRO has also launched satellites of some other nations with EOS-04 and if so, the details thereof; and

(f) the details of total number of satellites likely to be launched by ISRO during the current year?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) & (b)

Yes Sir, ISRO has successfully launched the earth observation satellite EOS-4 onboard PSLV-C52 on 14th February, 2022 at 05:59 hrs IST from Satish Dhawan Space Centre, Sriharikota, along with INS-2TD & INSPIRESat-1 as co-passengers. The Satellites were injected into the polar sun synchronous orbit at 524.84 km altitude.

EOS-4 is a Synthetic Aperture Radar (SAR) imaging satellite for Earth Observation, operating in C-band at 5.4 GHz frequency, for applications in the domains of agriculture, disaster management, water resources and forestry.

INS-2TD is the first satellite of the 2nd generation nanosatellites intended to demonstrate indigenously developed Nano systems for in-orbit performance.

INSPIRESat-1 is a student satellite of the class 9U, jointly developed by Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram, India and Laboratory of Space Physics, University of Colorado, Boulder, the USA, to

study the Ionosphere dynamics and sun's coronal heating processes.

(c) Currently, the satellites are undergoing various in-orbit tests and calibrations. Subsequently, the data available from the satellites will be used for achieving the mission objectives, during the designated mission life.

(d) The total time taken to realize the satellite is 63 months from date of financial sanction and the expenditure towards realization of satellite is nearly Rs. 490 crore.

(e) No, Sir.

(f) 7 satellites are likely to be launched by ISRO during the current year.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 4453

TO BE ANSWERED ON WEDNESDAY, MARCH 30, 2022

INFRASTRUCTURE FACILITIES OF ISRO

4453. MS. DEBASREE CHAUDHURI:

Will the PRIME MINISTER be pleased to state:

(a) whether the Indian Space Research Organisation (ISRO) has decided to open up its space to the private sector;

(b) if so, the details thereof indicating the proposals received from various companies for using ISRO's infrastructure facilities;

(c) the quantum of revenue earned by ISRO from launching satellites of various private and international agencies during the last three years; and

(d) the steps taken or proposed by the Government to develop ISRO's space business to earn more revenue, particularly from abroad?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Yes Sir. The Government has opened up the space sector for private players with the announcement of space sector reforms and formation of IN-SPACe, an independent body

under Department of Space which will regulate and promote private sector activities.

(b) There are 48 applications received to IN-SPACe for undertaking space activities and their applications are being processed for further action. Out of these, the applications with respect to authorizing the space activities to NGPEs are 16 and sharing of technology and facilities of DoS to NGPEs are 23 and Consultancy & Promotion are 9. All the proposals of NGPEs are at different stage of approvals.

(c) NewSpace India Limited (NSIL), a CPSE under Department of Space has earned a Foreign Exchange revenue of approx. 35 Million USD and 10 Million Euros during last three years 2019-2021, through launching of satellites of various private and international agencies.

(d) NSIL has already launched 45 international customer satellites on-board ISRO's PSLV during the last three years and has secured 4 Dedicated Launch service contracts for foreign satellite customers. With the emergence of Global Broadband communication needs, NSIL envisages launches of several of these foreign satellites on-board ISRO's SSLV, PSLV and GSLV-MkIII. NSIL through participation in various international conferences and exhibitions is ensuring better foot print of ISRO's expertise in building earth observation and communications satellites, providing launch and mission support services including establishment of ground segments for foreign customers to ensure enhanced Foreign Exchange revenue earnings for the country.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 4485

TO BE ANSWERED ON WEDNESDAY, MARCH 30, 2022

INDIAN SPACE ASSOCIATION

4485. SHRI ANURAG SHARMA:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has launched the Indian Space Association (ISpA) and if so, the details thereof and the aims and objectives behind the move;

(b) the details of reforms undertaken by the Government in space sector;

(c) whether the launch of IsPA is likely to boost private participation in space sector and if so, the details thereof;

(d) whether India accounts for only 2% of the space economy in the global market front though having huge potential; and

(e) if so, the steps taken by the Government to increase the global market share?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) ISpA is a voluntary association formed by Indian space industries and this will act as the advisory and advocacy group for the Space industry in India. ISpA will articulate industry views on space sector reforms which help them in guiding the space sector reform process so as have a vibrant and thriving space industry in India.

(b) As part of Space Reforms announced in June 2020, Government has opened up the sector for private industries participation to carry out end-to-end activities. The Indian National Space Promotion and Authorization Centre (IN-SPACe) shall act as the agency to promote, handhold and authorize private sector activities in the sector, besides enabling sharing of technical facilities and expertise from ISRO.

(c), (d) & (e)

With the operationalization of IN-SPACe, the progressively evolving regulatory environment and creation of space industries association in the form of ISpA, a greater private sector participation in end-to-end space activities is expected, which may result in increased share of India in the global space economy.

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O.I.H.

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 4527

TO BE ANSWERED ON WEDNESDAY, MARCH 30, 2022

PROMOTION OF STARTUPS/PRIVATE COMPANIES

4527. SHRI CHANDRA PRAKASH JOSHI:

Will the PRIME MINISTER be pleased to state:

(a) the steps being taken to promote private companies of the country, especially startups in the space sector;

(b) whether any amount has been released/is proposed to be released for these startups; and

(c) if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) There are several steps taken by Government of India to promote private companies of the country, in the space sector:

- **A national level autonomous Nodal Agency namely Indian National Space Promotion and Authorization Center (IN-SPACe) is established under Department of Space for**

promoting, handholding, authorizing and licensing private players to support their space activities

- Access to DOS facilities and expertise are extended to private entities to support their space activities
- Announcement of Opportunities offering challenges in new domains of space technology
- Government of India is encouraging the transfer of technologies developed in the field of space to Indian industries
- Apart from this, Government of India is bringing in new sector policies and guidelines and also revising existing policies
- With the space sector reforms, private sector including academic institutions, start-ups and industries is expected to participate in end-to-end space activities to expand the national space economy, generate more employment opportunities and create better manufacturing facilities.

(b) & (c)

As of now, there has been no fund released for activities of startups in space sector.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 4585

TO BE ANSWERED ON WEDNESDAY, MARCH 30, 2022

DEVELOPMENT OF SPACE SCIENCE

4585. SHRI RAMESH BIDHURI:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has taken/proposed to take any steps for development of space science, space research and satellite technology in the country;

(b) if so, the details thereof during the last five years; and

(c) the achievements made/shortcomings faced by the Government in this field?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Yes, Sir. Government has taken many initiatives for the development of space science, space research and satellite technology in the country.

(b) The following initiatives have been taken up during the last 5 years for joint collaborative research in the areas of space science and space research:

(36)

1. A MoU has been signed with Centre for Nano Science and Engineering (CeNSE) at Indian Institute of Science (IISc), Bangalore on April 21, 2017.
2. A Centre of Excellence on Advanced Mechanics of Materials has been set up at Indian Institute of Science (IISc), Bangalore on May 11, 2018.
3. Three numbers of Space Technology Cells (STCs) have been set up at Indian Institute of Technology (IIT), Delhi, Indian Institute of Technology (IIT), Roorkee and Indian Institute of Technology (IIT), Guwahati.
4. Six numbers of Regional Academic Centres for Space (RAC-S) have been set up at Malaviya National Institute of Technology (MNIT), Jaipur, (Rajasthan), Gauhati University, Guwahati, (Assam), National Institute of Technology (NIT), Kurukshetra, (Haryana), National Institute of Technology (NIT), Surathkal, (Karnataka), Indian Institute of Technology (IIT), BHU, Varanasi, (Uttar Pradesh) and National Institute of Technology (NIT), Patna, (Bihar).
5. Six numbers of Space Technology Incubation Centres (S-TIC) have been set up at National Institute of Technology, Agartala (Tripura), National Institute of Technology, Jalandhar (Punjab), National Institute of Technology, Tiruchirapally (Tamil Nadu), National Institute of Technology, Nagpur (Maharashtra), National Institute of Technology, Rourkela (Odisha), National Institute of Technology, Bhopal (Madhya Pradesh).

6. Another Centre called "Satish Dhawan Centre for Space Sciences" has been established jointly by Indian Space Research Organisation (ISRO) and Central University of Jammu at Jammu on March 12, 2022.
7. Further, to promote research and development in space technology through industry as well as academia, ISRO in collaboration with Veer Surendra Sai University of Technology (VSSUT), Burla, Sambalpur (Odisha), has set-up Veer Surendra Sai Space Innovation Centre (VSSSIC) within its campus at Sambalpur.
8. Under the sponsored research programme of ISRO called "RESPOND", 249 numbers of research and developed projects have been taken up with academia during the last 5 years.

(c) The above mentioned steps taken by Government have resulted in focused developments in the areas of space science, technology and applications, which in turn has translated into enhanced capabilities and technical improvements in the launch vehicles and satellites developed by ISRO.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 5561

TO BE ANSWERED ON WEDNESDAY, APRIL 06, 2022

DEVELOPMENT OF ADR FOR SPACE DEBRIS

5561. SHRI BRIJBHUSHAN SHARAN SINGH:

SHRI VISHNU DAYAL RAM:

SHRI ANIL FIROJIYA:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has proposed/taken steps for development of active removal technologies as Active Debris Removal (ADR) is necessary to stabilize the development of space debris;

(b) if so, the details thereof and if not, the reasons therefor;

(c) whether there is any data showing the amount of Indian space debris (space junk, space pollution, space waste or space garbage) in the Earth's orbit;

(d) if so, the details thereof;

(e) whether ISRO is planning to collaborate with other international spac organizations to help clean up space debris; and

(f) if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(39)

(a) Yes, Sir. ISRO is aware that development of active removal technologies as Active Debris Removal (ADR) is necessary to stabilize the development of space debris and ISRO has taken necessary steps to proceed with ADR studies.

(b) As per the studies made by Inter Agency Space Debris Co-ordination committee (IADC), ADR is necessary to stabilise the growth of Debris. ISRO is a member agency in IADC and ISRO team actively participates in these studies. Presently ISRO has taken up research activities to study the feasibility and technologies required to undertake active debris removal (ADR). Active Debris Removal (ADR) is one of the active methods suggested by Space Debris Research Community to contain the growth of Space Debris Objects. ADR is a very complex technology and involves policy and legal issues. Technology demonstration studies have been taken up by many countries including India. Developmental studies for finalising necessary technologies are initiated to demonstrate ADR.

(c) Yes, Sir. Statistics are available regarding Indian Space Objects including Debris. ISRO has released Indian Space Situational Awareness Report containing the details of Indian Space Objects.

(d) As per latest statistics (Orbital Debris Quarterly News December 2021), there are 102 Indian spacecraft including active and defunct satellites, 116 space debris objects including rocket bodies. Hence a total of 218 orbiting the Earth identified as Indian space objects.

(e) ISRO has been coordinating and collaborating with International Space Organisations in dealing with the space debris issues and efforts has been made to contain the growth of the space debris environment.

(f) ISRO has setup a Directorate (Directorate of Space Situational Awareness and Management at ISRO HQ) to deal with Space Debris related issues. A dedicated Space Situational Awareness Control Centre is set up in Bengaluru to coordinate all space debris related activities in ISRO and to safeguard Indian operational space assets from collision threats. ISRO is also planning to have its own observational facilities to track and catalogue the space objects.

ISRO actively participates in all international efforts to contain the space debris growth for the long term sustainability of outer space. ISRO is an active member of Inter Agency Space Debris Coordination Committee (IADC), IAF space debris working group, IAA Space Traffic Management Working Group, ISO space debris working group and UNCOPUOS long term sustainability Working Group, all international organisations contributing to the space debris studies and Space Situational Awareness (SSA). ISRO is collaborating with other space agencies like NASA, ESA, CNES, JAXA and SSAU in Space Debris Studies and issues.

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(41)

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 5662

TO BE ANSWERED ON WEDNESDAY, APRIL 06, 2022

LAUNCH OF SATELLITES

5662. ADV. A.M. ARIFF:

Will the PRIME MINISTER be pleased to state:

(a) the number of countries with which the Indian Space Research Organisation (ISRO) has entered agreements to launch their satellite into space;

(b) the revenue expected to be earned through these agreements; and

(c) the total number indigenous and foreign satellites that have been put into Earth's orbit?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Starting from 1999 till date, Indian Space Research Organisation (ISRO), through its commercial arms, has successfully signed

(92)

commercial launch service agreements with several global companies, agencies and institutions for launching satellites from 34 countries into space on-board Polar Satellite Launch Vehicle (PSLV).

(b) As on date, ISRO's commercial arms have earned a total Foreign Exchange Revenue of 56 Million USD and 190 Million Euros through launching of satellites from 34 countries.

(c) So far, 114 Satellites of ISRO, 13 Indian Student Satellites and 342 Foreign Satellites of 34 Countries has been launched by ISRO.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 5681

TO BE ANSWERED ON WEDNESDAY, APRIL 06, 2022

ISRO SPACE MISSIONS

5681. SHRI T.N. PRATHAPAN:

Will the PRIME MINISTER be pleased to state:

(a) the details of upcoming ISRO space missions;

(b) whether the Government has the data of expenses for these projects and if so, the details thereof;

(c) the details of collaborative projects with foreign space research organisations;

(d) whether the Government intends to establish more research centres in the country to support the research of ISRO;

(e) if so, the details thereof including the funds allocated for the same; and

(f) the number of satellites of India for educational, military and climate observation purposes at the international space station and in orbit?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(44)

(a) The upcoming ISRO space missions planned in 2022 are as follows:

i. 2 Polar Satellite Launch Vehicle (PSLV) missions including 1 dedicated commercial mission and 1 mission for launching the EOS-06 earth observation satellite

ii. 2 developmental flights of ISRO's Small Satellite Launch Vehicle (SSLV)

iii. 1 Geosynchronous Satellite Launch Vehicle (GSLV) mission for launching NVS-01 navigation satellite for NavIC

iv. 1 communication satellite mission (GSAT-24) through procured launch for commercial customer

v. 1 Geosynchronous Satellite Launch Vehicle – Mark III (GSLV Mk-III) mission, which is a dedicated commercial mission

(b) The details of approved project cost and cumulative expenditure up to February 2022 for these projects are given below:

(Rs in Crore)

Sl. No.	Project	No of Units Approved	Approved Project Cost	Cum. Exp till Feb 2022
1	PSLV Continuation (Phase-6)	30	6131.00	1092.32
2	Oceansat-3 & 3A	2	797.17	471.98

Sl. No.	Project	No of Units Approved	Approved Project Cost	Cum. Exp till Feb 2022
3	Development of SSLV	3	169.06	145.82
4	GSLV-operational (Phase-1 to Phase-3)	16	4365.41	3526.23
5	IRNSS 1J - 1N	5	964.68	403.02
6	GSAT-22/23/24	3	865.75	483.88
7	GSLV Mk III Continuation (Phase-1)	10	4338.20	730.12

(c) Government pursues collaborative projects with foreign space research organizations with the objectives of enhancing the capacity of the Indian space programme for advancing programmatic priorities, augmenting space science and earth observation data base, widening ground station networks, bettering products and services through joint experiments and creating platforms for inflow of expertise. Currently, Indian Space Research Organisation (ISRO) is working with National Aeronautics and Space Administration (NASA) of United States of America to jointly realise a satellite mission named 'NASA-ISRO Synthetic Aperture Radar (NISAR)' for scientific studies of Earth.

(d) Yes, Sir.

(e) Existing Space Technology Incubation Centre, Regional Academia Centre for Space will get a grant of Rs. 200 lakhs per year maximum and new proposed cells also will adopt the same guidelines.

(f) There are no satellites of India at the International Space Station. A total of nearly 5 transponders across 4 satellites for educational purposes and 4 satellites for climate observation purposes are currently in operation.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

LOK SABHA

UNSTARRED QUESTION NO. 5686

TO BE ANSWERED ON WEDNESDAY, APRIL 06, 2022

KALPANA CHAWLA CENTRE FOR RESEARCH

5686. SHRI RAJA AMARESHWARA NAIK:

SHRI RAJVEER SINGH (RAJU BHAIYA):

SHRI VINOD KUMAR SONKAR:

DR. SUKANTA MAJUMDAR:

SHRI BHOLA SINGH:

Will the PRIME MINISTER be pleased to state:

(a) **whether the Government has established Kalpana Chawla Centre for Research in Space Science and Technology (KCCRSST) at Chandigarh University and if so, the details thereof;**

(b) **whether the Government proposes to share space technology and expertise and open its various facilities for the industry and if so, the details thereof;**

(c) **whether the Government is working on setting up of Indian National Space Promotion and Authorisation Centre (IN-SPACe), if so, the details thereof; and**

(d) **the other steps being taken by the Government for strengthening the space sector of the country?**

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Kalpana Chawla Centre for Research in Space Science and Technology (KCCRSST) was inaugurated at Chandigarh University on January 03, 2022. This Research Centre has been established with the objectives of training students in space science, satellite development, meet future challenges in space research strengthening the space sector of the country ensuring India's leading position in future technologies.

(b) Yes, Sir. ISRO identified space technologies are available for transfer to interested & qualified industries through Technology Transfer mechanism. As approved by the Union Cabinet, the space sector is unlocked for non-governmental private entities including sharing technical facilities based on the demand.

(c) IN-SPACe is already established under Department of Space (DOS). IN-SPACe is a single window mechanism for promoting & authorizing space activities and usage of DOS owned facilities by Non-Governmental Entities (NGEs) as well as to finalise the launch manifest considering all stakeholders.

(d) Department of Space has established incubation cells & Space Technology cells to encourage R&D in space science, technology & applications at several premier institutes across the country. Department of Space sponsors R&D projects in the focused areas of space to the interested academia across the country. Department of Space has formulated the Indian Space Policy, 2022 for engagement of NGEs in the space activities.

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O.I.H.

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1087

TO BE ANSWERED ON THURSDAY, FEBRUARY 10, 2022

SPACECRAFTS LAUNCHED BY THE COUNTRY

1087. SHRI NARHARI AMIN:

Will the PRIME MINISTER be pleased to state:

(a) the number of spacecrafts launched by Space Centers in the country from 2016-17 to 2021-2022 till date, year-wise;

(b) the number of spacecrafts launched by the country for domestic use, year-wise; and

(c) the number of spacecrafts launched for other countries, year and country-wise?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) The number of Space Crafts launched by Space Centres in the country from 2016-2017 to 2021-2022 till date, year-wise are as follows:

Sl. No.	Year -Wise	Number of spacecrafts
1.	2016 - 2017	135
2.	2017 - 2018	67
3.	2018 - 2019	40
4.	2019 - 2020	56
5.	2020 – 2021	30
6.	2021 – 2022 (Till date)	1

(b) The number of space crafts launched by the country for domestic use, year-wise are as follows:

Sl. No.	Year -Wise	Number of spacecrafts
1.	2016 - 2017	13
2.	2017 - 2018	10
3.	2018 - 2019	8
4.	2019 - 2020	6
5.	2020 – 2021	7
6.	2021 – 2022 (Till date)	1

(c) During the year 2016-2017 to 2021-2022 a total of 285 customer satellites from 29 foreign countries were successfully launched on-board PSLV on commercial basis.

Year wise breakup of number of foreign satellites launched:

2016 -2017	2017 -2018	2018 -2019	2019 -2020	2020 -2021	2021 -2022
122	57	32	50	23	-

Country wise breakup of number of foreign satellites launched during 2016-17 to 2021-22:

Algeria (3), Australia (1), Austria (1), Belgium (3), Brazil (1), Canada (5), Chile (1), Colombia (1), Czech Republic (1), Finland (3), France (2), Germany (2), Indonesia (1), Israel (2), Italy (4), Japan (2), Kazakhstan (1), Latvia (1), Lithuania (7), Luxembourg (1), Malaysia (1), The Netherlands (2), Republic Of Korea (5), Slovakia (1), Spain (2), Switzerland (2), UAE (1), United Kingdom (6), USA (222).

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA
UNSTARRED QUESTION NO. 1088

TO BE ANSWERED ON THURSDAY, FEBRUARY 10, 2022

PERFORMANCE OF SATELLITE PROGRAMMES

1088. SHRI IRANNA KADADI:

Will the PRIME MINISTER be pleased to state:

(a) the details of total number of satellites launched by the country till date;

(b) whether Government has set any target to launch satellites for the benefit of various sectors of the country;

(c) if so, the details thereof;

(d) whether the targeted objectives have been achieved till date and if so, the details thereof, and if not, the reasons therefor; and

(e) whether Government is taking any effective measures to ensure better performance of the satellite programmes in the country and if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Beginning in the year 1975 and till date ISRO has launched a total of 129 satellites of Indian Origin and 342 foreign satellites belonging to 36 countries of which nearly 39 satellites are commercial satellites and rest are nano-satellites. Today, India has a total of 53 operational satellites in space providing various identified services to the nation. 21 of these are communication satellites, 8 are Navigation satellites, 21 are Earth Observation Satellites and 3 are Science Satellites.

(b) & (c)

The satellite enabled data and services are being used for the benefit of various sectors of the country. These include Television broadcasting, Direct-to-Home, ATM, Mobile communication, tele-education, tele-medicine and advisories on weather, pest infestation, agro-meteorology and potential fishing zones. Satellite data is also used for

crop production estimation, crop intensification, and agricultural drought assessment, wasteland inventory, identifying ground water prospect zones, inland aquaculture suitability and disaster risk reduction. ISRO has plans to launch more number of satellites to further enhance operational applications and cater the needs of emerging applications and user ministerial requirements in the country.

(d) Many of the applications have been effectively adopted by stakeholder departments for operational use. A few of such applications include: Potential Fishing Zone Forecast & Ocean State Forecast by Indian National Centre for Ocean Information Services, (MoES), Crop Acreage and Production Forecasting & National Agricultural Drought Assessment and Monitoring System by Mahalanobis National Crop Forecast Centre, (MoA&FW), Biennial Forest Cover Assessment by Forest Survey of India (MoEF&CC), Irrigation Infrastructure Assessment by Central Water Commission (Ministry of Jal Shakti), Weather forecasting by India Meteorological Department (MoES), Ground Water Prospect and Suitable Recharge Locations' mapping (Ministry of Jal Shakti), Integrated Watershed Management Programme & MGNREGA by MoRD.

As of now, 17 communication satellites are operational providing 293 transponders in different bands and 25 Gbps High Throughput Satellite (HTS) capacity. These satellites are supporting Television Broadcast, DTH TV, VSAT connectivity for banks, commercial enterprises, strategic & societal communications. HTS capacity support broadband connectivity to Gram Panchayats under BharatNet programme.

(e) To promote utilisation of space technology in State Government departments, State level workshops have also been conducted in 17 States. Other measures include (i) conduct of user interaction meets and utilization programmes; (ii) capacity building for space applications; (iii) creation of an outreach facility; (iv) development of geospatial tools and information systems; (v) Proof of Concept demonstration; (vi) Institutionalisation of space applications; and (vii) setup of PC-SAMS i.e., Planning Committee-Space Application Management System under the chairmanship of Principal Scientific Adviser to PM with members from different central ministry secretaries.

Further, Government has also announced reforms in June, 2020, in the space sector towards enabling the private players to provide end to end services. Subsequently a national level autonomous Nodal Agency namely Indian National Space Promotion and Authorization Centre (IN-SPACe) has been established under DOS for promoting, handholding, authorising and licensing private players to carry out Space Activities

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1899

TO BE ANSWERED ON THURSDAY, MARCH 17, 2022

GAGANYAAN PROGRAMME

1899. SHRI M. MOHAMED ABDULLA:

Will the PRIME MINISTER be pleased to state:

(a) whether Government has any plan to develop reusable rockets similar to SpaceS rockets, the detail thereof;

(b) the current status of the Gaganyaan programme, the details thereof;

(c) the current status of the spacecraft proposed to be used in the Gaganyaan programme, the details thereof;

(d) whether the spacecraft proposed for Gaganyaan programme has been rated for humans, the details thereof; and

(e) the tentative date of launch of India's first crewed spaceflight?

ANSWER

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

(a) Yes sir. ISRO is planning to develop & demonstrate critical technologies for vertical take-off & vertical landing using a Test Vehicle, leading to recovery and reuse of the booster stage of a rocket in future. ISRO is also developing a winged body Reusable Launch Vehicle for which a series of technology demonstration missions are planned. The first experimental mission of Reusable Launch Vehicle – Technology Demonstrator (RLV-TD) vehicle was successfully carried out on May 23, 2016. Further missions to demonstrate autonomous runway landing & orbital re-entry are also planned.

(b) The current status of Gaganyaan programme is as follows:

i. An Astronaut training facility has been commissioned in Bengaluru. Training activities are progressing well at the newly commissioned Astronaut training facility.

(54)

ii. The design of all systems and sub-systems for Gaganyaan has been completed. Realisation of the same is in different stages of progress.

iii. Long duration qualification test of human rated cryogenic engine and First phase testing of human rated VIKAS Engine completed. First phase of demonstration tests for Gaganyaan service module propulsion system completed.

iv. Proof of concept demonstration for ground network with service providers completed. Construction of integration facility for Orbital module preparation is nearing completion.

v. The MoU, contracts and Implementation arrangement (IA) related activities with both national and international agencies are progressing well. The design of various human centric products has been completed and various prototypes are under realization.

vi. Receipt of Gaganyaan deliverables against contracts with M/s Glavkosmos (Russia) and CNES (France) commenced.

vii. Roles and responsibility for crew recovery operations and rehearsals finalised. Detailed operational requirements for nominal mission scenarios worked out.

viii. The activities related to development of microgravity experiments have commenced. The conceptual design for experiments is under review.

(c) Orbital module/spacecraft configuration for various drop tests, test vehicle flights, unmanned missions and manned mission is finalised. Realization of hardware commenced.

(d) Yes, Sir. As part of crew safety, various systems of Gaganyaan including the launch vehicle and Orbital module will be human rated. The human-rating philosophy includes redundancy, probabilistic risk assessment and increased margins at systems.

(e) The major missions viz., Test vehicle flights for the validation of Crew Escape System performance are currently targeted for second half of year 2022. Subsequently, the 1st unmanned mission of Gaganyaan (G1) is targeted for the beginning of the year 2023. This will be followed by second unmanned mission and first manned mission.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1898

TO BE ANSWERED ON THURSDAY, MARCH 17, 2022

STATUS OF SECOND SPACE STATION AT THOOTHUKUDI IN TAMIL NADU

1898. SHRI P. WILSON:

Will the PRIME MINISTER be pleased to state:

(a) the current status of the second space station being built at Thoothukudi district in Tamil Nadu;

(b) whether Government has taken initiatives in incentivizing startups being developed in the space sector; and

(c) if so, the details thereof and, if not, the reasons therefor?

ANSWER

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

(a) With respect to second "Launch Site" at Thoothukudi, the land acquisition activities are still under progress by Government of Tamil Nadu and full extent of the land is yet to be handed over to Department of Space/ISRO.

(b) & (c)

Several initiatives have been taken by the Government for incentivizing start-ups being developed in the space sector. With the reforms announced in June 2020, an Authorization Centre (IN-SPACe) has been created which shall promote, handhold, authorize and monitor private sector activities in space domains. Besides, Department of Space (DoS) facilitates and expertise shall be extended to private entities to support their space activities. DoS is also in the process of bringing in forward-looking policies to create a stable regulatory environment.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1900

TO BE ANSWERED ON THURSDAY, MARCH 17, 2022

COMMERCIALIZATION OF SPACE TECHNOLOGY

1900. SHRI ABIR RANJAN BISWAS:

Will the PRIME MINISTER be pleased to state:

(a) the details of indigenous space technology commercialized in the last five years;

(b) the details of revenue generated by commercialization of the space technology during the last five years, year-wise;

(c) whether any Indian corporate is engaged in the development of space technology;

(d) if so, the details of the organisation engaged;

(e) whether they received any Government funding for technology development;

(f) if so, the details of total funds disbursed to them, and

(g) if not, the reasons therefor?

ANSWER

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

(a) ISRO has commercialized 128 space technologies through Indian industries during last five years.

(b) The details of revenue generated by the commercialization of the space technology in the last five years is-

Year	Revenue through Technology Transfer (TT) Fee and Royalty in Lakhs (in Rupees)
2016-17	29.76
2017-18	141.85
2018-19	701.42
2019-20	219.72
2020-21	81.13

(c) Yes, Sir. Indian corporates are engaged for realizing the space materials, propellants and critical subsystems.

(d) Several industries are engaged including

1. Hindustan Aeronautics Limited (HAL), 2. Mishra Dhatu Nigam Limited (MIDHANI), 3. Larsen & Toubro Limited (L&T), 4. Reliance Industries Limited (RIL) 5. Godrej Aerospace 6. Walchandnagar Industries (WIL), 7. Lakshmi Machine Works, 8. ITI Limited 9. Centum Electronics Limited, 10. Astra Microwave Products Limited, etc.

(e), (f) & (g)

ISRO transfers the technology along with know-how to industries for development of critical materials, sub-systems, etc.

No fund transfer is done for technology development.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 1901

TO BE ANSWERED ON THURSDAY, MARCH 17, 2022

LAUNCH OF ISpA FOR BROADBAND SERVICES

1901. SHRI SANJAY RAUT:

Will the PRIME MINISTER be pleased to state:

(a) whether Government has launched the Indian Space Association (ISpA), an industrial body consisting of various stakeholders including ISRO and private telecom companies to provide broadband services through satellite in every part of the country;

(b) if so, the details and the salient features thereof; and

(c) the details of steps taken or proposed to be taken by Government for improving satellite communication system in the country for providing broadband services in every part of the country?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) & (b)

ISpA is a voluntary association of Indian space industries which will articulate industry views on space sector reforms and help them in guiding the reform process so as to have a vibrant and thriving space industry in India.

(c) At present, three Indian High Throughput Satellites with 25 Gbps capacity are operational for providing broadband connectivity under BharatNet programme to Gram Panchayats where adequate Optical Fibre Cable (OFC) connectivity is not available. One more High Throughput Satellite is under realization. Government has opened up space sector for participation of the private players so that they can build, own and operate satellites to meet the growing demands for satellite capacity in the country

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2403

TO BE ANSWERED ON THURSDAY, MARCH 24, 2022

MISSIONS OF ISRO

2403. SHRI Y.S. CHOWDARY:

Will the PRIME MINISTER be pleased to state:

(a) the details of satellites launched from 2017 till date and the purpose of launch;

(b) the future action plan of the Indian Space Research Organisation (ISRO) which is gearing up for a number of missions including the launch of the first unmanned mission of Gaganyaan;

(c) the details of pending ISRO projects and also the launch of the Earth Observation Satellites, EOS4 and EOS6 on board the Polar Satellite Launch Vehicle (PSLV), etc; and

(d) the objectives of Venus mission and other missions and the progress made till date?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) 28 satellites, built by ISRO, have been successfully launched into their designated orbits, since 2017. These satellites have been realized for different purposes of earth observation, communication, navigation, experimental and planetary exploration.

(b) For the coming years, initiatives are being undertaken for various ambitious missions that includes Technology Demonstration Satellite and GAGANYAAN. About 30 satellites in

the domain of earth observation, communication, navigation and space science are in different stages of realization.

(c) EOS-04 has been successfully launched and placed in the desired orbit by ISRO on 14 February, 2022. The other ISRO projects in advanced stages of completion include EOS 06, NVS-01 & ADITYA-L1.

(d) The Venus Mission, which is under study, envisages to further improve our understanding of origin and evolutionary processes of Venus, its atmosphere, ionosphere etc. The various objectives of other ISRO planned missions include improving the understanding of space science, provision of communication and navigation related services, remote sensing applications etc. The missions are under various stages of realization that includes configuration and system study, design, subsystem realization, performance verifications, spacecraft level tests etc..

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2523

TO BE ANSWERED ON THURSDAY, MARCH 24, 2022

ACTIVE DEBRIS REMOVAL (ADR) TECHNOLOGY

2523. DR. AMEE YAJNIK:

Will the PRIME MINISTER be pleased to state:

(a) whether Government is aware that development of active removal technologies as Active Debris Removal (ADR) is necessary to stabilize the development of space debris;

(b) if so, the details thereof, and if not, the reasons therefor;

(c) whether there is any data showing the amount of Indian space debris (space junk, space pollution, space waste, or space garbage) in Earth's orbit;

(d) if so, the details thereof;

(e) whether ISRO is planning to collaborate with other international space organizations to help clean up space debris; and

(f) if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Yes, Sir.

(b) As per the studies made by Inter Agency Space Debris Co-ordination committee (IADC) ADR is necessary to stabilise the growth of Debris. ISRO is a member agency in IADC and ISRO team actively participates in these studies. Presently ISRO has taken up research activities to study the feasibility and technologies required to undertake active debris removal (ADR). Active Debris Removal (ADR) is one of the

active methods suggested by Space Debris Research Community to contain the growth of Space Debris Objects. ADR is a very complex technology, which also involves policy and legal issues. Technology demonstration studies have been taken up by many countries including India. Developmental studies for finalising necessary technologies to demonstrate ADR are initiated.

(c) Yes, Sir. Statistics are available regarding Indian Space Objects including Debris. ISRO has released Indian Space Situational Awareness Report containing the details of Indian Space Objects.

(d) As per latest statistics (Orbital Debris Quarterly News December 2021), there are 102 Indian spacecraft including active and defunct satellites, 116 space debris objects including rocket bodies. Hence a total of 218 orbiting the Earth are identified as Indian space objects.

(e) ISRO has been coordinating and collaborating with International Space Organisations in dealing with the space debris issues and efforts has been made to contain the growth of the space debris environment.

(f) ISRO has setup a Directorate (Directorate of Space Situational Awareness and Management) at ISRO HQ to deal with Space Debris related issues. A dedicated SSA Control Centre is set up in Bengaluru to coordinate all space debris related activities in ISRO and to safeguard Indian operational space assets from collision threats. ISRO is also planning to have its own observational facilities to track and catalogue the space objects.

ISRO actively participates in all international efforts to contain the space debris growth for the long term sustainability of outer space. ISRO is an active member of Inter Agency Space Debris Coordination Committee (IADC), IAF space debris working group, IAA Space Traffic Management Working Group, ISO space debris working group and UNCOPUOS long term sustainability Working Group, all international organisations contributing to the space debris studies and space situational Awareness. ISRO is collaborating with other space agencies like NASA, ESA, CNES, JAXA and SSAU in Space Debris Studies and issues

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2527

TO BE ANSWERED ON THURSDAY, MARCH 24, 2022

FINALISATION OF SPACE PROGRAMMES

2527. SHRI PRAKASH JAVADEKAR:

Will the PRIME MINISTER be pleased to state:

(a) number of satellites of India and other countries that have been carried and located in proper space locations;

(b) the space programmes finalized for the next three years;

(c) the status of the programmes; and

(d) the benefits which will accrue to India with these programmes?

ANSWER

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

(a) As on date, 114 Satellites of ISRO, 13 Student Satellites and 342 Foreign Satellites of 34 Countries have been launched and injected in the designated orbit by ISRO.

(b) For the coming three years, initiatives are being undertaken for various prestigious missions that includes EOS-06, ADITYA-L1, Technology Demonstration Satellite, XPOSAT, CHANDRAYAAN-3, GAGANYAAN, NVS-01, CMS-01.

(c) The programmes are under various stages of realisation that includes system study, design, subsystem realisation, performance verifications, spacecraft level tests etc.

(d) The space programmes planned are intended to provide multiple benefits to the country, which includes increase in transponder capacity for DTH services, operational continuity for satellite based navigation services, furthering knowledge base in Space Sciences, remote sensing applications for ocean related services and advisories towards potential fishing zone forecast, ocean state forecast etc.

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(64)

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2528

TO BE ANSWERED ON THURSDAY, MARCH 24, 2022

MANAGING SPACE DEBRIS

2528. SHRI SUSHIL KUMAR GUPTA:

Will the PRIME MINISTER be pleased to state:

(a) Whether Government has taken any steps to manage space debris;

(b) Whether it is a fact that after unlocking of the space sector for private players, innovative startups are coming up in a big way to explore the untapped potential of this sector; and

(c) If so, the steps that are being taken to encourage private sector in this area?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Yes, Sir. ISRO has setup a Directorate (Directorate of Space Situational Awareness and Management) at ISRO HQ to deal with Space Debris related issues. A dedicated SSA Control Centre is set up in Bengaluru to coordinate all space debris related activities in ISRO and to safeguard Indian operational space assets from collision threats. The collision threats to Indian space assets are analysed and estimated daily, and in case of critical collision threats, collision avoidance manoeuvers are designed and executed to mitigate the collision threats and hence safeguarding Indian Space Assets. ISRO is also planning to have its own observational facilities to track and catalogue the space objects.

(b) & (c)

Yes, Sir. The unlocking of space sector for private players has seen an enthusiastic response from start-ups, several of which are coming up to carry out end-to-end activities in the sector. In order to handhold, promote and authorize their activities, a national level nodal agency – Indian National Space Promotion and Authorization Centre (IN-SPACe) has been created, which shall also enable sharing of technical facilities and expertise from ISRO.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2529

TO BE ANSWERED ON THURSDAY, MARCH 24, 2022

STATUS OF MARS MISSION

2529. SHRI M. MOHAMED ABDULLA:

Will the PRIME MINISTER be pleased to state:

(a) The details of the Chandrayaan-3 Mission;

(b) Whether Government has any plans to launch a rover mission to Mars, if so, the details thereof; and

(c) If not, the reasons therefor?

ANSWER

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

(a) The Chandrayaan-3 mission will carry a Lander module and a Rover module. The Lander module will land on the surface of the moon carrying the Rover Module. The objectives of the mission are safe and soft landing, Rover roving on the moon and In-situ scientific experiments. Towards this, activities are in advanced stages of integration and testing. The mission is tentatively planned during the third quarter of 2022.

(b) & (c)

Currently, studies are underway for planning future missions to Mars focusing on scientific outcomes and technical feasibility.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2530

TO BE ANSWERED ON THURSDAY, MARCH 24, 2022

THREATS POSED BY SPACE DEBRIS

2530. SHRI M. MOHAMED ABDULLA:

Will the PRIME MINISTER be pleased to state:

(a) whether Government is aware of the threats posed by space junk and space debris, the details thereof;

(b) the steps taken by Government to tackle the growing issue of space debris and space junk, the details thereof;

(c) if not, the reasons therefor; and

(d) the stand of Government on the introduction of Low Earth Orbit based Satellite Internet services and the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Yes, Sir.

(b) ISRO has setup a Directorate (Directorate of Space Situational Awareness and Management) at ISRO HQ to deal with Space Debris related issues. A dedicated SSA Control Centre is set up in Bengaluru to coordinate all space debris related activities in ISRO and to safeguard Indian operational space assets from collision threats. The

collision threats to Indian space assets are analysed and estimated daily, and in case of critical collision threats, collision avoidance manoeuvres are designed and executed to mitigate the collision threats and hence safeguarding Indian Space Assets. ISRO is also planning to have its own observational facilities to track and catalogue the space objects. Also, ISRO has been coordinating and collaborating with International Space Organisations in dealing with the space debris issues and efforts have been made to contain the growth of the space debris environment.

(c) Does not arise

(d) Low Earth Orbit constellations of satellites are owned and operated by global operators. The services of such constellations over India require

(i) authorization for space systems, and

(ii) license for providing communication and internet services.

Proposals are received from some of the global operators for providing services over India, which are under process.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2531

TO BE ANSWERED ON THURSDAY, MARCH 24, 2022

COMMERCIAL SPACE POLICY

2531. SHRI SUJEET KUMAR:

Will the PRIME MINISTER be pleased to state:

(a) whether there is any Commercial Space Policy in the country that provides for exploration of space by commercial entities;

(b) if so, the details thereof, and if not, whether there is any plan to promote private participation in the space exploration;

(c) Government's stance on the need to re-examine the Outer Space Treaty, and the steps it has taken internationally regarding the same; and

(d) the details of foreign collaboration in space governance and steps it has taken to thwart competition from China?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) & (b)

The Union Cabinet of Government of India (GoI) has announced space reforms for "Unlocking the space potential of India". As part of space sector reforms, Government of India has created a national level autonomous Nodal Agency namely Indian National

Space Promotion and Authorization Centre (IN-SPACe) under DOS for promoting, handholding, authorising and licensing private players to carry out Space Activities.

(c) Government has not taken any steps to re-examine the Outer Space Treaty.

(d) Other than being a signatory to United Nations Treaties and Conventions on governing the space activities, the Government of India has no foreign collaboration in space governance. India's foreign collaboration in the field of space is pursued considering our own needs and it does not address thwarting competition from any nation.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 2532

TO BE ANSWERED ON THURSDAY, MARCH 24, 2022

PRIVATE INDUSTRY PLAYERS ENGAGED IN SPACE EXPLORATORY ACTIVTIES

2532. SMT. VANDANA CHAVAN:

Will the PRIME MINISTER be pleased to state:

(a) details of private players engaged with Indian National Space Promotion and Authorization Centre for various space activities since 2020;

(b) revenue earned by ISRO since 2020 by providing access to its facilities to private players, year and facility-wise;

(c) details of Indian industry partners engaged with New Space India Limited for end-to-end Polar Satellite Launch Vehicle (PSLV) realization through Indian partners;

(d) current status and progress of mission to build launch-vehicles indigenously; and

(e) whether Government plans to promote private space exploration companies on lines of SpaceX and BlueOrigin, if so, funds allocated/disbursed/utilized and steps taken for the same?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) & (b)

Since 2020, there have been 48 applications from private players received to IN-SPACe for undertaking space activities and their applications are being processed for further action. Out of these, the applications with respect to authorizing the space activities to

(71)

NGPEs are 16; sharing of technology and facilities of DoS to NGPEs are 23 and Consultancy and Promotion are 9. No revenue has been earned by ISRO during this time by providing access to its facilities to private players.

(c) NewSpace India Limited released a Request for Proposal (RFP) for End-to-End realization of 5 Number of Polar Satellite Launch Vehicle (PSLV) through Indian Industry. The following Indian Industry have submitted their Techno-commercial proposal for undertaking this task in response to the RFP:

1. Hindustan Aeronautics Limited (HAL) and Larson & Toubro (L&T) [Consortia]
2. Bharat Heavy Electrical Limited (BHEL)
3. Bharat Electronics Limited (BEL); Adani Enterprises Limited (AEL) and Bharat Earth Movers Limited (BEML) [Consortia]

(d) Indian Space Research Organization (ISRO) has successfully developed and operationalized three indigenous launch vehicles viz. Polar Satellite Launch Vehicle (PSLV), Geosynchronous Launch Vehicle (GSLV) & Geosynchronous Launch Vehicle – Mark III (GSLV Mk-III) for launching satellites for earth observation, navigation, communication and Space Science & exploration. ISRO has also developed a Small Satellite Launch Vehicle (SSLV) and the first developmental flight is targeted during the first half of 2022.

(e) As part of Space Reforms announced in June 2020, Government has opened up the sector for private industries participation to carry out end-to-end activities. The Indian National Space Promotion and Authorization Centre (IN-SPACe) shall act as the agency to promote, handhold and authorize private sector activities in the sector, besides enabling sharing of technical facilities and expertise from ISRO

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O.I.H.

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 3337

TO BE ANSWERED ON THURSDAY, MARCH 31, 2022

INDIA-SINGAPORE TECHNOLOGY SUMMIT

3337. SHRI REWATI RAMAN SINGH:

Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that India-Singapore Technology Summit for space sector has been organized recently by Confederation of Indian Industry (CII);

(b) whether it is also a fact that India's new Foreign Direct Investment (FDI) policy for the space sector in this summit envisages allowing foreign companies to set up their infrastructure as per Government guidelines; and

(c) if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) Yes, Sir.

(b) & (c)

Department of Space is in the process of drafting a National Space Policy, under the broad framework of which detailed guidelines pertaining to FDI shall be made available.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 4133

TO BE ANSWERED ON THURSDAY, APRIL 07, 2022

OPENING UP OF SPACE SECTOR TO PRIVATE PLAYERS

4133. SHRI NARAYANA KORAGAPPA:

Will the PRIME MINISTER be pleased to state:

(a) whether the roadmap for opening up the space sector of the country to private players has been prepared;

(b) if so, the details thereof;

(c) the support required for start ups in the space sector; and

(d) the anticipated business in the space sector?

ANSWER

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

(a) Yes, Sir.

(b) In June, 2020, Government of India announced reforms in space sector, opening the doors for enhanced participation of Non-Governmental Entities (NGEs) in carrying out end-to-end activities in space domain and providing a level playing field to private sector. Subsequent to this, an independent nodal agency – Indian National Space Promotion and Authorisation Centre (IN-SPACe) has been created under Department of Space (DOS), to

promote, handhold and authorize activities of NGEs in space sector. Further, DOS is also in process of issuing a Indian Space Policy, 2022 to create an enabling environment to facilitate such activities.

(c) Space Sector, being technologically challenging and capital intensive, calls for enhanced support for startups working there. Startups in the sector require support from ISRO with regards to utilization of specialized technical facilities, technical guidance and review, launch support and knowledge on best practices.

(d) In India, space activities were being carried out by DOS alone, hence, the share in space business was limited. Now, as the Government has opened up the sector, it is expected that several industries, including MSMEs and Start-ups, would undertake end-to-end space activities, which in turn would lead to increased business in the sector and contribution to economy.

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GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 4134

TO BE ANSWERED ON THURSDAY, APRIL 07, 2022

EARTH OBSERVATION SATELLITE (EOS) SERIES

4134. SHRI TIRUCHI SIVA:

Will the PRIME MINISTER be pleased to state:

(a) the details of satellites and the purpose for which they have been merged into the new EOS series and the details of the new categorization;

(b) the purpose for which the EOS-2 satellite was created, the slated date of launch which was deferred, reasons for the delay, and an estimated time-frame for its launch;

(c) whether Government has enquired into the reasons for the failure of the launch of the EOS-3 satellite, if so, the findings thereof, and if not, the reason for not initiating an inquiry; and

(d) the related-projects that have been delayed due to these failures?

ANSWER

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

(a)The details of the satellites included in the EOS series are as follows

a. EOS-01: Earth Observation satellite meant for Agriculture, Forestry & disaster management support

b. EOS-02: Technology demonstration satellite for various new technologies with applications that include agriculture, forestry, geology, hydrology etc. and forming the payload for SSLV-1.

c. EOS-03 : First Agile Earth Observation satellite in Geostationary orbit and applications which include near real time imaging, quick monitoring of natural disasters, spectral signatures for agriculture, forestry etc.

d. EOS-04 : Radar Imaging satellite meant to provide high quality images under all weather conditions for applications such as Agriculture, Forestry & Plantations, Soil Moisture & Hydrology and Flood Mapping.

e. EOS-05 : Earth Observation Satellite in the Geostationary Orbit.

f. EOS-06 : Earth Observation satellite meant for applications, which include ocean related services and advisories towards potential fishing zone forecast , ocean state forecast

(b) EOS-02 satellite was created for Technology demonstration of new technologies that include miniaturised power electronics, reaction wheels etc. The slated date of launch was during Quarter-4 of 2021. The onset of the pandemic and consequent lock down was a factor in the delay of spacecraft realisation due to non-availability of components, man power and facilities. Furthermore there was a disruption in global as well as domestic supply chain. The estimated time frame for the launch is during Quarter 2 of 2022.

(c) Yes, Sir. Initial investigations with the post-flight data conducted immediately after the launch indicated that an anomaly in the Cryogenic Upper Stage led to failure of the mission. A National level Failure Analysis Committee (FAC) consisting of experts from academia & ISRO was immediately constituted to identify the causes of the anomaly in the Cryogenic Upper Stage of GSLV, that led to mission abort and to recommend corrective actions for future missions. The Committee observed that the build-up of pressure in the propellant (Liquid Hydrogen or LH2) tank during the flight was not normal leading to a lower tank pressure at the time of ignition of the engine. This resulted in anomalous operation of the Fuel Booster Turbo Pump (FBTP) mounted inside the LH2 tank which feeds the main turbopump of the engine resulting in insufficient flow of Liquid Hydrogen into the engine thrust chamber. Detailed studies indicate that the most likely reason for the observed reduction in LH2 tank pressure is a leak in the respective Vent and Relief Valve (VRV), which is used for relieving the excess tank pressure during flight. Computer simulations as well as multiple confirmatory ground tests, closely simulating the conditions in the GSLV-F10 flight, validated the analysis by the FAC.

(d) The Failure Analysis committee has recommended improvements to enhance the robustness of the Cryogenic Upper Stage for future GSLV missions. The GSLV vehicle with the required modifications in the Cryogenic Upper Stage is expected to be ready by the third quarter of 2022. The satellite identified for the next GSLV mission is expected to be ready for launch in the fourth quarter of 2022. Therefore, no delay is envisaged with respect to the related projects due to the failure.

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(77)

O.I.H.

GOVERNMENT OF INDIA

DEPARTMENT OF SPACE

RAJYA SABHA

UNSTARRED QUESTION NO. 4135

TO BE ANSWERED ON THURSDAY, APRIL 07, 2022

SPACE CENTRE AT CENTRAL UNIVERSITY, JAMMU

4135. SHRI BRIJLAL:

Will the PRIME MINISTER be pleased to state:

(a) whether Government has opened North India's first space centre at Central University, Jammu, if so, the details thereof;

(b) the facilities available to students for study and research in this space centre; and

(c) whether this centre has started functioning, if so, the details thereof and if not, by when it is likely to be started?

ANSWER

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

(a) Yes, Sir. Department of Space and Central University of Jammu has jointly established a centre called Satish Dhawan Centre for Space Sciences at Central University of Jammu for carrying out research in Space sciences and technology.

(b) The centre houses different labs/facilities related to geospatial data analysis, materials, astrophysics, atmospheric sciences, etc. for the students to study and carryout research.

(c) The centre was inaugurated on March 12, 2022 and started functioning. The process of identifying projects for joint development is in progress for carrying out research.

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