



ANNUAL REPORT

— 2024-2025 —



Department of Telecommunications
Ministry of Communications
Government of India
New Delhi

ANNUAL REPORT 2024-25



सत्यमेव जयते

Department of Telecommunications

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CHAPTER 1

DEPARTMENT OF TELECOMMUNICATIONS

CHAPTER 1

DEPARTMENT OF TELECOMMUNICATIONS

The Department of Telecommunications (DoT) is, inter-alia, responsible for Telecom Policy; Licensing and Coordination matters relating to telegraph, telephones, telecom wireless data; international cooperation in matters connected with telecommunications, promotion of standardization, Research & Development (R&D) in telecommunications; creation of telecom infrastructure/access in rural areas and promotion of private investment in the sector. DoT is also responsible for frequency management in the field of radio communication in close coordination with the international bodies. DoT enforces wireless regulatory measures by monitoring wireless transmission of all users in the country.

1.1 Functions of Department

As per the Second Schedule to the Government of India (Allocation of Business) Rules 1961, the functions of the Department are as under (Box 1.1).

BOX 1.1

- Policy, Licensing and coordination matters relating to Telegraphs, Telephones, Wireless, Data, Facsimile, Telematic services and other like forms of communications.
- International cooperation in matters connected with telecommunications including matters relating to international bodies dealing with telecommunications such as International Telecommunication Union (ITU), its Radio Regulation Board (RRB), Radio Communication Sector (ITU-R), Telecommunication Standardization Sector (ITU-T), Development Sector (ITU-D), International Telecommunication Satellite Organization (INTELSAT), International Mobile Satellite Organization (INMARSAT), Asia Pacific Telecommunication (APT).
- Promotion of standardization, research and development in telecommunications.
- Promotion of private investment in telecommunications.
- Financial assistance for furtherance of research and study in telecommunications technology and building up adequately trained manpower for telecom program, including-
 - Assistance to institutions, assistance to scientific institutions and universities for advanced scientific study and research; and
 - Grant of scholarships to students in educational institutions and other forms of financial aid to individuals including those going abroad for studies in the field of telecommunications.
- Procurement of Stores and equipment required by the Department of

Telecommunications.

- Digital Communications Commission (DCC), Telecom Regulatory Authority of India (TRAI) and Telecom Disputes Settlement and Appellate Tribunal (TDSAT).
- Administration of laws with respect to any of the matters specified in this list, namely:
 - The Indian Telegraph Act, 1885 (13 of 1885);
 - The Indian Wireless Telegraphy Act, 1933 (17 of 1933); and (c) The Telecom Regulatory Authority of India Act, 1997 (24 of 1997).
- Post disinvestment matters relating to M/s Hindustan Teleprinters Limited.
- Matters relating to Indian Telephone Industries (ITI Ltd), Bharat Sanchar Nigam Limited (BSNL), Mahanagar Telephone Nigam Limited (MTNL) and Bharat Broadband Network Limited (BBNL)
- Tata Communications Limited (TCL) and Telecommunications Consultants (India) Limited
- All matters relating to Centre for Development of Telematics (C-DOT).
- Residual work relating to erstwhile Department of Telecom Services and Department of Telecom Operations, including matters relating to-
 - Cadre control functions of Group 'A' and other categories of personnel till their absorption in Bharat Sanchar Nigam Limited;
 - Administration and payment of terminal benefits.
- Execution of works, purchase and acquisition of land debitable to the capital Budget pertaining to telecommunications.

1.2 Digital Communications Commission (DCC)

The Telecom Commission was set up by the Government of India vide Resolution dated 11th April, 1989 with administrative and Financial powers of the Government of India to deal with various aspects of Telecommunications. The Government, vide Resolution dated 22nd October, 2018, has re-designated the 'Telecom Commission' as the 'Digital Communications Commission'.

The Digital Communications Commission consists of a Chairman, four full time members, who are ex-officio Secretaries to the Government of India in the Department of Telecommunications and four part time members who are the Secretaries to the Government of India in the concerned Departments. The Secretary to the Government of India in the Department of Telecommunications is the ex-officio Chairman of the Digital Communications Commission. The full-time Members of the Digital Communications Commission are Member (Finance), Member (Production), Member (Services) & Member (Technology). The part-time Members of the Digital Communications Commission are Chief Executive Officer, NITI (National Institution for

Transforming India) Aayog, Secretary (Department of Economic Affairs), Secretary (Ministry of Electronics & Information Technology) and Secretary (Department for Promotion of Industry and Internal Trade). The Digital Communications Commission is responsible for:

- i) Formulating the policy of Department of Telecommunications for approval of the Government;
- ii) Preparing the budget for the Department of Telecommunications for each financial year and getting it approved by the Government; &
- iii) Implementation of Government's policy in all matters concerning telecommunication.

The Chairperson, in his/her capacity as Secretary to the Government of India in the Department of Telecommunications is responsible for arriving at decisions on technical questions and advising the Government on policy and allied matters of telecommunications.

The Chairperson and the Members of the Commission, at present, are as under:

Composition of Digital Communications Commission	
Chairperson (Ex-officio)	Secretary (Telecom)
Members (Full time)	Member (Finance)
	Member (Services)
	Member (Technology)
Members (Part time)	Chief Executive Officer, NITI Aayog
	Secretary, Department of Economic Affairs
	Secretary, Ministry of Electronics & Information Technology
	Secretary, Department for Promotion of Industry and Internal Trade

1.2.1 Major decisions taken by the Digital Communications Commission

During the year 2024, three meetings were held of DCC on 08.01.2024, 09.07.2024 and 26.11.2024. Important decisions of these meetings are as follows:

- i) The Digital Communications Commission considered and approved the revised Detailed Project Report (DPR) of digital platform under the aegis of Digital Intelligence Unit, with following details:
 - a) Establishing digital platform under the aegis of Digital Intelligence

Unit (DIU) with cloud based and decentralized approach to maximize the roles of (Telecommunications Service Providers) TSPs with total financial outlay of Rs. 228.16 Crore (including Goods and Services Tax) for design, development, deployment, Operation & Maintenance (O&M) of digital platform under the aegis of DIU for a period of 5 years.

- b) Entrusting Centre for Development of Telematics (C-DOT) for designing, development, deployment, O&M for central layer in distributed architecture on nomination basis.
- ii) Submarine cable systems connecting the world are considered critical telecommunication infrastructure for international connectivity as they carry about 99% of international communication traffic. India currently has 17 submarine cable systems with 21 Cable Landing Station (CLS) in operation, and 6 more high-capacity systems are being commissioned and expected to be operational in the near future. The Digital Communications Commission considered and approved the proposal of "Allowing National Long Distance (NLD) licenses to establish, own, maintain and operate domestic submarine cable."
- iii) The Digital Communications Commission considered and approved the proposal of executing the work of Unified portal by Independent Business Vertical in C-DOT with additional works of 'Implementation of Digital by Design version of Telecommunications Act-2023' and third party Impact Assessment. This work will be executed over the 5 year period, in accordance with terms specified by Chief Operating Officer (IBV) with total financial implication of Rs. 129.86 crore (excluding GST, other taxes). The Unified Portal will be an integrated IT platform which will facilitate efficient and error-free life cycle management of licensees, ensure service facilitation, ease of doing business, coherent & cohesive implementation of Telecommunications Act-2023 and data driven policy measures.
- iv) TRAI provided its recommendations on "Usage of Embedded SIM for Machine-to-Machine (M2M) Communications" on 21.03.2024. The decision of standing committee on TRAI recommendation no 3.1 and 3.4 were placed before Digital Communications Commission for approval. The Commission considered this item and approved that all communication profiles on any M2M eSIM fitted in an imported device on international roaming in India should be mandatorily converted/reconfigured into communication profiles of Indian telecom service providers within a period of six months from the date of activation of international roaming in India on such M2M eSIM or on change of

ownership of the device, whichever is earlier and for installation of profiles of Indian TSPs on M2M eSIMs fitted in the devices imported in India, the Concerned Original Equipment manufacturer (OEM) and Machine to Machine Service Providers (M2MSP) should download the profile from the SM-DP (controlling element), of the Indian TSP to the M2M eSIMs through the new (Indian) SM-SR (controlling element), after SM-SR switch from foreign to Indian under the GSMA framework for remote SIM provisioning.

1.3 Organisation Chart

The Organization chart of the Department of Telecommunications (DoT) Members is at Annexure-I.

1.4 Statutory / Regulatory Bodies in the Telecom Sector

The Telecom Regulatory Authority of India (TRAI) is a statutory body. It is the sector regulator and plays a pivotal role in development of the telecom, broadcasting and cable services. It has worked towards providing a fair and transparent environment which encourages competition and level-playing field for service providers and protecting the interest of consumers and enabling technological advancement. The Telecom Disputes Settlement & Appellate Tribunal (TDSAT) performs the role of an appellate body. The details of their functioning are given in Chapter 6.

1.5 Attached, Subordinate and Field Offices of DoT

The functions of these offices are given in the following paragraphs, in brief.

1.5.1 Digital Bharat Nidhi (DBN):

Digital Bharat Nidhi erstwhile known as Universal Service Obligation Fund (USOF), formed by an Act of Parliament, was established w.e.f. 01.04.2002 under the Indian Telegraph (Amendment) Act, 2003 (further amended in 2006), to provide financial support for the provision of telecom services in commercially unviable rural and remote areas of the country. It is an attached office of the Department of Telecom, Ministry of Communications.

The resources for implementation of Universal Service Obligation (USO) are raised by way of collecting a Universal Service Levy (USL), which is 5% of the Adjusted Gross Revenue (AGR) of TSPs. It is a non-lapsable Fund. Levy amount is credited to the Consolidated Fund of India. Fund is made available to USOF after due appropriation by the Parliament.

The USOF was established with the fundamental objective of providing access to 'basic' telecom services to people in the rural and remote areas at affordable and reasonable prices. Subsequently, the scope was widened to provide subsidy support for enabling access to all types of telecom services, including

¹Further details on attached, subordinate and field offices are in Chapter 4 & 7.

mobile services, broadband connectivity and creation of infrastructure like Optical Fiber Cable (OFC) in rural and remote areas.

As per the Telecommunications Act, 2023 (No.44 of 2023) and the subsequent notification of Telecommunications (Administration of Digital Bharat Nidhi) Rules 2024 dated 30.08.2024, the Universal Service Obligation Fund (USOF) created under the Indian Telegraph Act, 1885, has been renamed as “Digital Bharat Nidhi” (DBN).

The DBN has mandate to support universal service through promoting access and delivery of telecommunication service in underserved rural, remote and urban areas.

1.5.2 Telecommunications Engineering Centre (TEC):

TEC is the Technical Wing of DoT. Its Mission is to:

- i) Develop new specifications and update the existing ones in order to keep pace with the global development.
- ii) Establish state-of-art telecom laboratories.
- iii) Actively participate in professional bodies such as International Telecommunication Union (ITU), Internet Engineering Task Force (IETF), Asia Pacific Telecommunity (APT) etc. to protect country's interest.
- iv) Technology approval for Centre for Development of Telematics (C-DOT) in order to develop telecom technology aimed specifically for local manufacturer.

1.5.3 Director General Telecom (DGT):

The DGT is an attached office of DoT. The DGT was created with an objective of monitoring and controlling the Department's LSA field units in all the 22 Licensed Service Area (LSAs) located across the country. Headquarters of Director General Telecom (DGT-HQ) is located in Delhi.

The officers represent the licensing/ telegraph authority in the field. The LSA field units play an important role as an interface between the State Government and DoT for activities such as Right of Way issues, Smart City coordination, IPv6 implementation, improving the coverage in uncovered areas, etc., The LSA field units' also function as an interface between Law Enforcement Agencies and the TSPs in the matters related to National Security. In addition to the above, the LSA field units play a crucial role in implementation of time synchronization across the telecom network, inspection of USOF funded sites, National Broadband Mission to provide each and every household with broadband connectivity, using telecom analytics for protecting consumers from Cyber Frauds, etc.

DoT Licensed Service Area (LSA) have the following five verticals:

- i) Service Compliance

- ii) Security
- iii) Technology
- iv) Administration
- v) Rural

1.5.4 Controller General of Communication Accounts (CGCA):

The office of CGCA is an attached office of the DoT. CGCA has been tasked to supervise the functioning of Controller of Communication Accounts (CCAs). There are 28 CCAs offices located across the country.

The Pr. CCA/CCA offices play a critical role in providing a professional interface between DoT and its various stakeholders at the ground level on issues such as collection & assessment of license fee and spectrum usage charges, management of USOF, review of USOF activities etc.

1.5.5 Wireless Monitoring Organisation (WMO):

WMO performs various functions related to spectrum management such as resolution of harmful interference, monitoring/identification of frequency sub-bands for introduction of new services and/ or for additional allocation to existing services; monitoring for spectrum recovery – unused/ under-used frequency authorizations; inspection of licensed installations, monitoring of space emissions to protect authorized satellite transmissions, etc.

WMO carries out wireless monitoring through 22 Wireless Monitoring Stations, 1 International Satellite Monitoring Earth Station (ISMES), 5 International Monitoring Stations (IMSS) strategically located all over India. WMO is also equipped with 5 Radio Noise Survey Units, which undertake detailed and complicated measurements to aid in the spectrum management activity. The Headquarter of WMO is situated in New Delhi. It also has four Regional Headquarters (RHQs) at New Delhi, Mumbai, Kolkata and Chennai.

1.5.6 National Communications Academy (NCA)

Three training institutes of DoT- National Telecommunications Institute for Policy Research, Innovation and Training (NTIPRIT), the National Institute of Communication Finance (NICF) and Wireless Monitoring Training & Development Centre (WMTDC) have been merged into a single administrative entity, named 'National Communications Academy' (NCA).

Secretary (T) heads the National Communications Academy as its ex-officio Chairperson with Additional Secretary (T) as its Vice-Chairperson.

The newly created National Communications Academy is designed to create better integration and efficiency by streamlining training, resource optimization, and to offer a more holistic approach to skill-building, addressing

various aspects of the communications sector.

1.5.7 National Centre for Communication Security (NCCS):

The mandate of NCCS is to establish and operationalize a framework of telecom security testing and certification within the country. Presently, three verticals under NCCS look after various facets of telecom security testing and certification viz. Security Assurance Standards (SAS) division, Security Lab Recognition (SLR) division and Security Certification (SC) division. It has headquarters at Bengaluru.

1.5.8 SATCOM Monitoring Centre (SMC) (erstwhile known as Network Operations Control Centre (NOCC)):

SMC (formerly NOCC) is responsible for managing and coordinating satellite services in India, including VSAT, broadcasting, DTH, HITS, ISP, DSNG, and IFMC. It oversees the use of both Indian and foreign satellites, ensuring proper operation and resolving RF interference. SMC also ensures that earth station and DSNG antennas meet the latest ITU/TEC standards through testing and validation.

SMC monitors the use of satellite services from more than 38 teleport operators, 32 VSAT hubs, and about 2.87 lakh VSAT terminals, along with 5 DTH operators, 1 HITS operator, and 47 DSNG operators. These services are used for telecommunications, broadcasting, and other applications by government, commercial, and private users.

In addition, SMC helps maintain an interference-free satellite environment by reviewing and approving frequency and link plans, carrier plans, and antenna self-test results. The main office of SMC is located in Delhi, with a satellite earth station in Sikandrabad, Uttar Pradesh.

1.6 PSUs and Autonomous bodies under DoT

There are 5 PSUs under DoT namely Bharat Sanchar Nigam Limited (BSNL), Mahanagar Telephone Nigam Limited (MTNL), ITI Limited (ITI), Telecommunications Consultants India Limited (TCIL) and Bharat Broadband Network Limited (BBNL). The Centre for Development of Telematics (C-DOT) is an autonomous body and is also the Research & Development (R&D) arm of the Department. Brief functions of these organizations are given below:

1.6.1 Bharat Sanchar Nigam Limited (BSNL)

BSNL, fully owned by Government of India, was formed in October 2000. It provides telecom services across the length and breadth of the country excluding Delhi and Mumbai. BSNL is providing all types of telecom services namely telephone services on landline, mobile, broadband, internet, leased

circuits and long distance telecom services. Rural telephony is one of the focus areas of BSNL alongwith special emphasis on development of telecommunication facilities in North-Eastern region, tribal areas as well as in the LWE-affected areas.

1.6.2 Mahanagar Telecom Network Limited (MTNL)

MTNL, set up in 1986, provides telecommunication facilities in metros viz. - Delhi and Mumbai. MTNL provides fixed-line service in these two Metropolitan Cities. For Cellular services, the company has the license to provide services in Delhi including National Capital Region (NCR) (towns of Ghaziabad, Faridabad, Noida and Gurgaon) and in Mumbai including Navi Mumbai, Kalyan & Dombivili.

1.6.3 ITI Limited

ITI Limited (earlier Indian Telephone Industries Ltd) was established in 1948 with the vision of attaining self-reliance in the field of telecommunication needs of the country. The company was set up at Bangalore (Karnataka) with Govt. of India holding majority equity stake in the Company. ITI has its Registered & Corporate Office located at Bangalore. The Company is a Schedule 'A' CPSE in Heavy and Medium Engineering Sector.

For manufacture and supply of telecom equipments to the Department, ITI started its operations in Bangalore in 1948, and subsequently manufacturing plants were set up at Srinagar in Jammu and Kashmir; Naini, Rae Bareli and Mankapur in Uttar Pradesh; and Palakkad in Kerala. All the manufacturing plants are accredited with ISO 9001-2015 and ISO 14001-2015 standards.

1.6.4 Telecommunications Consultants India Limited (TCIL)

TCIL was set-up on 10.03.1978 with the main objective of providing world class technology in all fields of telecommunications and information technology to excel in its operations in overseas and in the domestic markets by developing proper marketing strategies, to acquire state of the art technology on a continuing basis and maintain leadership. It has diversified into Cyber Parks, Intelligent Buildings, Cyber & Smart Cities and upgrading legacy networks by focusing on Broadband Multimedia Convergent Service Networks, entering new areas of IT as systems integrator in Telecom billing customer care value added services; e-governance networks and Telecom fields by utilizing TCIL's expert technical manpower, developing Telecom and IT training infrastructure in countries abroad and aggressively participating in SWAN and IT-education projects in various States.

1.6.5 Bharat Broadband Network Limited (BBNL)

BBNL, a Special Purpose Vehicle (SPV), was incorporated on February 25, 2012 under the Indian Companies Act, 1956 with an authorized share capital of

Rs. 1000 crore. As per the mandate given by the Government of India, BBNL shall set up, provide (i.e. procure, install, test, commission), operate, maintain and manage Optical Fibre Cable (OFC) under the flagship BharatNet programme of the Government.

1.6.6 Centre for Development of Telematics (C-DOT)

C-DOT is an autonomous telecom research & development body funded by the DoT. It was established under the Society Registration Act XXI in 1984 to design and develop indigenous switching technology. C-DOT is presently engaged in developing state-of-the-art telecommunication technology to meet the needs of the Indian telecommunication network. It is involved in research and development (R&D) activities as well as in field implementation of technologies developed.

CHAPTER 2

THE TELECOM SECTOR, REFORMS AND INITIATIVES

CHAPTER 2

THE TELECOM SECTOR, REFORMS AND INITIATIVES

2.1 Telecom Sector

The Indian telecom sector has witnessed significant developments in recent years, setting the stage for a transformative era. India has 99% coverage footprint in 4G and around 4.62 lakhs 5G Base Transceiver Station (BTS).

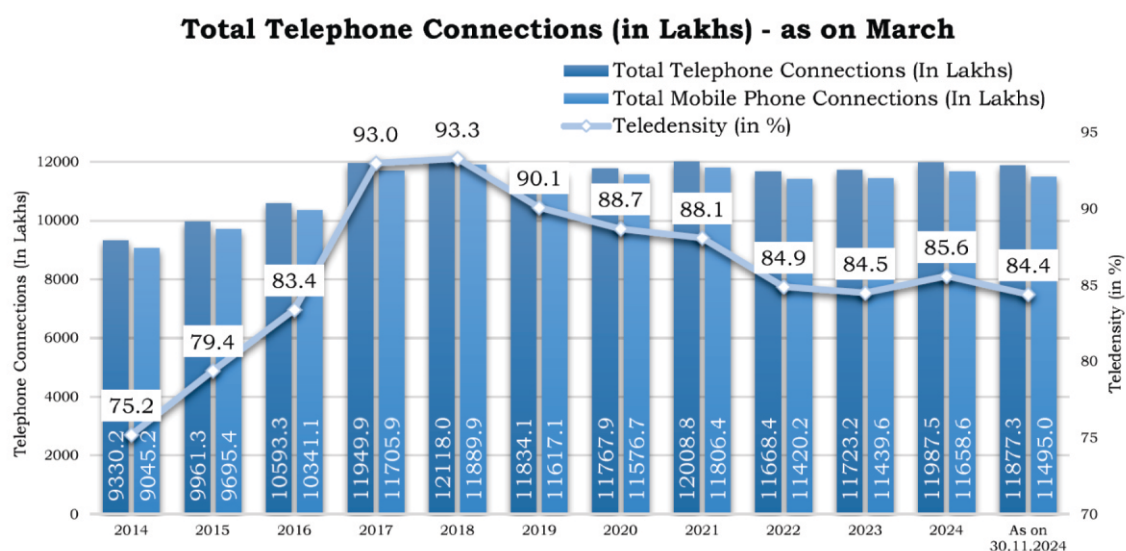
2.1.1 Rollout of 5G Services

5G services were first launched in India in October, 2022. India is among the fastest growing 5G networks in the world. The roll out of 5G has also improved the quality of network, with faster download speeds.

2.1.2 Indian Telecom Scenario

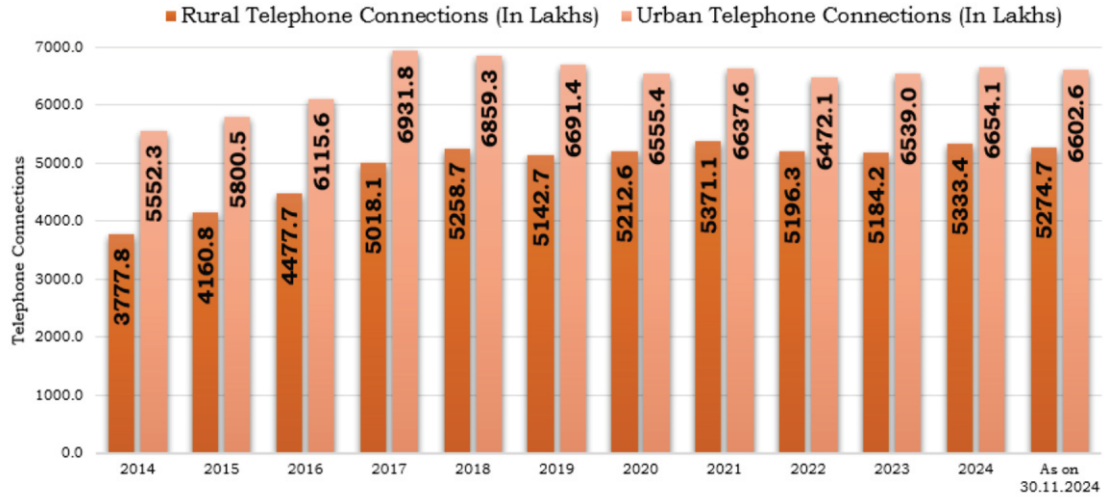
i) Telephone Subscription:

- a) Total telephone connections rose to 11877.3 lakhs as on 30.11.2024 from 9330.2 lakhs as on 31.03.2014, with a growth of 27.30%. The number of mobile connections reached to 11495.0 lakhs as on 30.11.2024. The tele-density which was 75.23% as on 31.03.2014 has reached 84.36% as on 30.11.2024.



- b) Urban telephone connections rose to 6602.6 as on 30.11.2024 from 5552.3 lakhs as on 31.03.2014, a growth of 18.92% while the growth in rural telephone connections was 39.62%, which is more than double of urban increase, rising from 3777.8 lakhs as on 31.03.2014 to 5274.7 lakhs as on 30.11.2024. The rural tele-density jumped from 44% as on 31.03.2014 to 58.23% as on 30.11.2024.

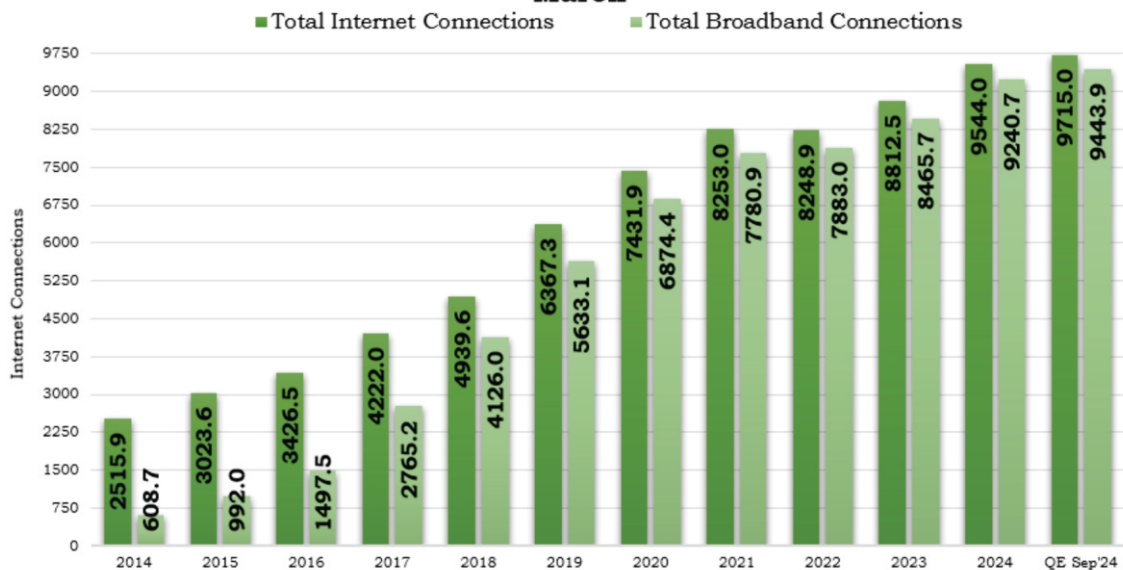
Total Rural-Urban Telephone Connections (In Lakhs)-As on March



ii) Internet and broadband penetration:

- Internet connections jumped from 2515.9 lakhs as on 31.03.2014 to 9715.0 lakhs as on 30.09.2024, registering a growth of 286.14%.
- Broadband connections rose from 608.7 lakhs as on 31.03.2014 to 9443.9 lakhs as on 30.09.2024, growing by 1451.49%.

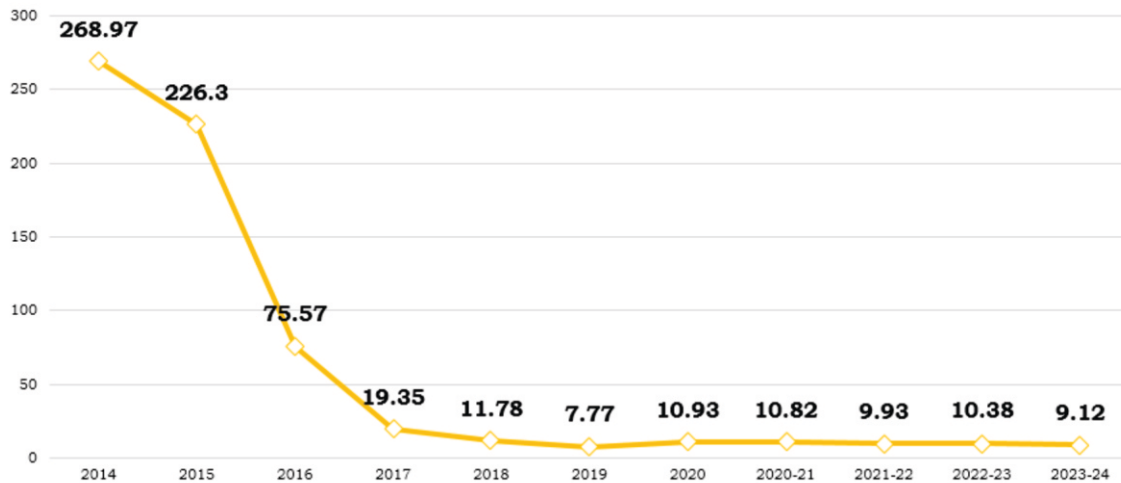
Total Internet and Broadband Connections (In Lakhs)-QE March



Source: Quarterly Performance Indicator Report, TRAI.

- c) Average revenue realization per subscriber per GB wireless data reduced to Rs. 9.12 at the end of March, 2024 from Rs. 268.97 at the end of December 2014, a reduction of more than 96.61%.

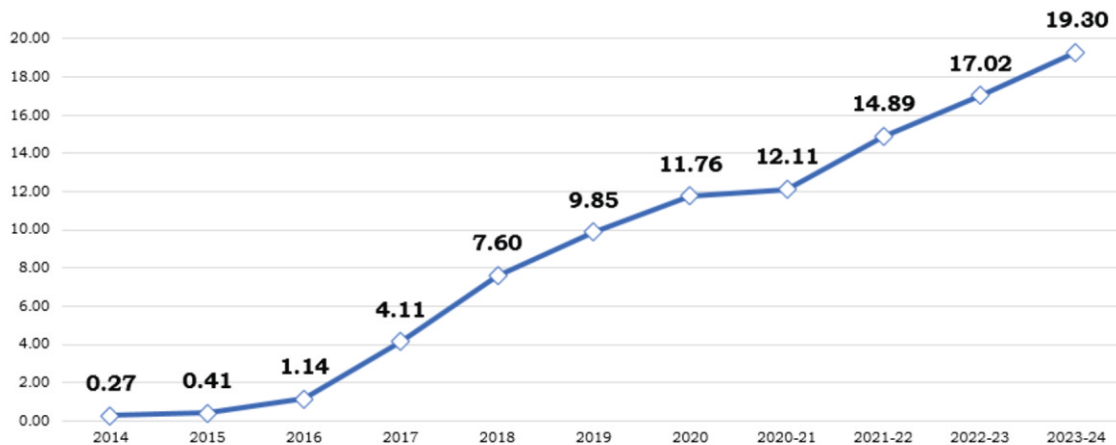
Average revenue realization per subscriber per GB wireless data-QE March (in Rs.)



Source: Yearly Performance Indicator Reports of TRAI. Note: Calendar Year figures upto 2020 and 2020-21 onwards it is for Financial Years

- d) Average Wireless Data usage (in GB) per data user per month increased to 19.30 GB at the end of March, 2024 from 0.27 GB at the end of December 2014.

Average Wireless Data usage (in GB) per data user per month



Source: Yearly Performance Indicator Reports of TRAI. Note: Calendar Year figures upto 2020 and 2020-21 onwards it is for Financial Years

iii) BTS and Towers:

- a) The number of Mobile Base Transceiver Stations (BTS) are 29.49 lakhs as on 30.11.2024.
- b) The number of mobile towers are 8.14 lakhs as on 30.11.2024.

2.2 National Digital Communications Policy-2018

The National Digital Communications Policy-2018 (NDCP-2018) was launched by the Government of India in 2018 with a vision to fulfil the information and communication needs of citizens and enterprises through establishment of a ubiquitous, resilient, secure, accessible and affordable Digital Communications Infrastructure and Services. The policy aims to support India's transition to a digitally empowered economy and society. The policy further seeks to unlock the transformative power of digital communications networks for achieving the goal of digital empowerment and improved well-being of the people. The policy has the following three Missions: -

- i) **Connect India:** To promote 'Broadband for All' as a tool for socio-economic development, while ensuring service quality and environmental sustainability.
- ii) **Propel India:** To harness the power of emerging digital technologies, including 5G, Artificial Intelligence (AI), Internet of Things (IoT), Cloud and Big Data to enable provision of future ready products and services; and to catalyze the fourth industrial revolution (Industry 4.0) by promoting Investments, Innovation and IPR.
- iii) **Secure India:** To secure the interests of citizens and safeguard the digital sovereignty of India with a focus on ensuring individual autonomy and choice, data ownership, privacy and security; while recognizing data as a crucial economic resource.

The broad strategic objectives of the policy and the status of implementation thereof are as under: -

- i) **Broadband for All:** -The policy recognizes digital communications infrastructure and services as key enablers and critical determinants of India's growth and well-being. One of the objectives of the policy is 'Broadband for All'. In order to fulfill this objective, the Government has launched the National Broadband Mission with a vision to enable fast track growth of digital communications infrastructure, to bridge the digital divide for digital empowerment and inclusion, and to provide affordable and universal access of broadband for all.
- ii) **Creating additional jobs in the Digital Communications sector:** Initiatives taken by the Government and Telecom Companies have boosted

economic activities such as e-commerce, telecom operations, cable TV operations, etc. in the remote and difficult areas of the country. This has resulted in creating additional job opportunities. Prime Minister's Wi-Fi Access Network (PM-WANI) framework also aims to boost economic activities and create sizeable number of jobs in the country.

- iii) Enhancing the contribution of Digital Communications sector to India's Gross Domestic Product (GDP): Digital Communication is playing a central role in driving the larger economic activities in the country. The sector has given a fillip to significantly increase uptake of services in e-Commerce, FinTech, HealthTech, EdTech, AgriTech, UrbanTech, etc. Major services by Government to citizens and Government to businesses are also primarily delivered through the underlying telecommunications, especially in the aftermath of the pandemic. Consumption of these services has led to huge growth of the wireless data consumption in the country.
- iv) Enhancing India's contribution to Global Value Chains: Enhancement of India's contribution to the Global Value Chain is a continuous process. Steps such as liberalizing spectrum licensing norms for experimentation and research; and simplification of import license requirements for domestic Original Equipment Manufacturers (OEMs) etc. have been taken to enable India to develop as a manufacturing hub.
- v) Ensuring Digital Sovereignty: -There are provisions available in the Indian Telegraph Act 1885 and the Indian Telegraph Rules made there under to protect secrecy, privacy and confidentiality of communications. Further, appropriate conditions have been incorporated in the Unified Telecom License for protection of privacy and confidentiality of communications over the telecommunications networks. Security testing framework is under the overall framework of Mandatory Testing and Certification of Telecom Equipment (MTCTE). The Government has notified 'National Security Directive on Telecommunication Sector' for identification of trusted source and trusted products for telecom sector.

2.3 Telecom Reforms

2.3.1 The Telecommunications Act, 2023

- i) Background:
 - a) India is the second largest telecom market in the world. Telecommunication in India is primarily regulated by the Indian Telegraph Act, 1885 and the Indian Wireless Telegraphy Act, 1933. However, the technology and the nature of telecommunication have undergone a massive change since then and in order to keep pace with

emerging technologies, telecommunication legislation needs to be evolved. Most of the countries like United States (US), United Kingdom (UK), Singapore etc. have updated their legislation to keep pace with innovation in telecom sector.

- b) In order to update the existing laws and to address the challenges of the Telecom sector, this Department initiated a public consultative process in July 2022. In the process, comments were received from Service Providers, Equipment Manufacturers, Industry Associations, International Organizations, Government Organizations, several State Govts., and public at large. As a result of this exercise, the Telecommunications Act, 2023 was finalized and enacted.
- c) Enforcement of the Act's provisions and rules will enable effective and modern regulation of Telecom sector. It will provide clearly defined framework for spectrum assignment and its optimal utilization, effective and efficient RoW framework, strong provisions for National Security and Public emergency, etc. promote innovation and technology development through Digital Bharat Nidhi and Regulatory Sandboxes. The Act provides for protection of users and for two-tier Adjudication Mechanism along with Voluntary Undertakings.
- ii) Salient features of the Telecommunication Act are:
 - a) Simple regulatory framework: The Act provides for a simple regulatory framework of authorization under which different terms and conditions can be provided for different types of services. To prevent disruption, existing licenses, registrations, permissions shall remain valid till their term ends, or they can migrate to the new authorization framework if they chose to do so.
 - b) Spectrum Assignment: The Act provides a clearly defined framework for spectrum assignment. Central Government, being owner of the spectrum on behalf of the people, shall assign spectrum through auction, except for specific items in Schedule-I, for which assignment shall be done by administrative process. The basis of including items in Schedule 1 is public interest, government functions like defence, or when auction is not the preferred mode of assignment due to technical or economic reasons.
 - c) Optimal utilization of spectrum: The Act provides legal framework for efficient utilization of scarce spectrum through processes such as harmonization, re-farming, secondary assignment, sharing, trading, leasing and surrender of spectrum.
 - d) Effective Right of Way framework: Right of Way (RoW) is important for faster roll-out of telecom services such as new mobile towers and laying optical fiber. The Act provides a strong framework for RoW. The definition

of public entities has been broadened to include government agencies, local bodies and Public-Private Partnership (PPP) projects like airports, seaports, and highways. Public entities shall be obligated to provide right of way except in special circumstances. The fee for right of way would be subject to a ceiling. The Act provides complete framework for RoW in respect of private property based on mutual agreement. The Act also provides that the RoW to be granted shall be non-discriminatory and as far as practicable on a non-exclusive basis. It also provides that telecommunication infrastructure shall be distinct from the property it is installed on. This will help reduce the disputes when property is sold or leased. A dispute resolution mechanism is proposed to be created at district level for all RoW matters.

- e) Common ducts: In line with PM Gati Shakti vision, the law provides for Central Government to establish common ducts and cable corridors.
- f) Telecommunication standards: Telecom is a global industry. To ensure national security and promote India's technology developers, the Act lays down powers to set standards for telecommunication services, telecommunication networks, telecommunication security, etc.
- g) National Security and Public safety: The Act provides strong provisions to take necessary measures for national security and public safety.
- h) Innovation and technology development: The Act expands the scope of Universal Service Obligation Fund to include supporting universal services in underserved rural, remote, and urban areas; supporting research and development of telecommunication services, technologies and products and pilot projects. It provides legal framework for Regulatory Sandbox to facilitate innovation, and deployment of new technology.
- i) Voluntary Undertaking mechanism: In case a business makes a mistake, it should be given a chance to rectify the mistake and move on after paying a requisite penalty. To enable this, a mechanism of Voluntary Undertaking has been proposed in the law. Voluntary mechanism and the two-tier dispute resolution mechanism prior to judicial forum will help avoid going to courts and reduce the litigation load in telecom sector.
- j) Protection of users: Telecommunication is a powerful tool for empowerment of masses. However, it can be misused to cause harm to users. The Act provides measures for protection of users from unsolicited commercial communication and create a grievance redressal mechanism.
- k) Strong provisions for offences and penalties: For preventing various undesirable activities in the telecom sector, offences and penalty

structure has been envisaged in the Act.

- l) Digital by design: The Act provides that the implementation shall be digital by design. The Adjudicating Officer and Designated Appeals Committee shall also function as digital offices.
- iii) Present Status (as on 10.12.2024)
 - a) In accordance with section 1(3) and after consultation with various relevant divisions, the Central Government issued Gazette Notification enforcing sections 1,2, 10 to 30, 42 to 44, 46, 47, 50 to 58, 61 and 62 of the Telecommunications Act w.e.f. 26.06.2024. The Department has also notified sections 6 to 8, 48 and 59(b) of the Act w.e.f. 05.07.2024.
 - b) The Department is presently in the process of framing of rules under various sections of the Telecom Act, 2023. As per section 56(1), the Central Government is required to publish the draft rules in the Official Gazette for consultation before finalising.

Accordingly, Department has so far published the following rules for consultation:

- draft Telecommunications (Digital Bharat Nidhi) Rules, 2024 on 04.07.2024;
- draft Telecommunications (Right of Way) Rules, 2024 on 09.07.2024;
- draft Telecommunications (Adjudication and Appeal) Rules, 2024 on 18.07.2024;
- draft Telecommunications (Commercial Radio Operators Certificate of Proficiency to Operate Global Maritime Distress and Safety System) Rules, 2024 on 24.07.2024; and
- draft Telecommunications (Amateur Station Operator) Rules, 2024 on 25.07.2024.
- draft Temporary Suspension of Telecommunication Services Rules, 2024 on 29.08.2024.
- draft Telecommunications (Procedures and Safeguards for Lawful Interception of Messages) Rules, 2024 on 29.08.2024.
- draft Telecommunications (Telecom Cyber Security) Rules, 2024 on 29.08.2024.
- draft Telecommunications (Critical Telecommunication Infrastructure) Rules, 2024 on 29.08.2024.
- draft Telecommunications (Regulatory Sandbox) Rules, 2024 on 28.11.2024.

After public consultation, the following rules have been notified in the Official Gazette:

- Telecommunications (Administration of Digital Bharat Nidhi) Rules, 2024 on 31.08.2024
- Telecommunications (Right of Way) Rules, 2024 on 18.09.2024
- Telecommunications (Commercial Radio Operator Certificate of Proficiency to Operate Global Maritime Distress and Safety System) Rules, 2024 on 01.11.2024
- Telecommunications (Amateur Services) Rules, 2024 on 01.11.2024
- Telecommunications (Telecom Cyber Security) Rules, 2024 on 21.11.2024
- Telecommunications (Critical Telecommunication Infrastructure) Rules, 2024 on 22.11.2024
- Telecommunications (Temporary Suspension of Services) Rules, 2024 on 22.11.2024
- Telecommunications (Procedures and Safeguards for Lawful Interception of Messages) Rules, 2024 on 06.12.2024.

2.4 Initiatives

2.4.1 Introduction of Production Linked Incentive Scheme for Telecom & Networking Products under Atmanirbhar Bharat:

The Department of Telecommunications (DoT) notified the Production Linked Incentive (PLI) Scheme on 24th February 2021, with a financial outlay of Rs. 12,195 Crore (and out of which Rs. 2500 Crore allocated to MSMEs). The purpose is to incentivize investments and incremental sales.



Further, in the June 2022, design led as a part of PLI was introduced with additional incentive of 1% over and above the existing incentives for products that are designed and manufactured in India, extending the scheme by one more year with the option to existing companies to add more products and apply under design led PLI scheme.

A total of 42 companies including 28 MSMEs & 14 non-MSMEs have been approved under the Scheme. As per commitments given, these 42 applicants are expected to invest more than Rs. 4000 crore and generate incremental employment of more than 44,000 people with a Total Eligible Sales target of around Rs. 2.37 Lakh crore over the scheme period (FY 2021-22 to FY 2026-27).

Performance of Telecom PLI Scheme (as on 31.12.2024) is as follows:

Cumulative Investment (Rs. Crore): 4,016

Total Sales (Rs. Crore): 74,478

Out of which, exports (Rs. Crore): 13,972

Employment (Nos.): 26,513

Incentive Disbursement (Rs. Crore): 331.86 (18 Companies)

Also, the Scheme has further helped in creating atmanirbharta in products such as Gigabit Passive Optical Network (GPON), Optical Network Terminal (ONT) & Customer premises equipments (CPEs).

2.4.2 Sangam: Digital Twin Initiative

In February 2024, the Department of Telecom (DoT) launched the Sangam: Digital Twin initiative, aimed at addressing challenges in infrastructure planning using AI-driven insights and advanced telecom, sensing, and imaging technologies. The initiative seeks to overcome inefficiencies caused by fragmented planning across sectors and to create a unified ecosystem for infrastructure planning with comprehensive, up-to-date data.

The initiative is structured in two phases:

- i) Stage I: Exploratory Phase – This stage encouraged wide participation to explore use cases and foster innovative thinking.
- ii) Stage II: Development and Demonstration – This stage focuses on the practical application of selected use cases.

The response to Stage I's Proof of Concept (PoC) was highly successful, with 199 submissions, and about 150 participants selected, including major telecom companies, tech firms, and academic institutions. The selected participants include global players like Amazon, IBM, Oracle, and Siemens, as well as IITs and NITs, highlighting the initiative's broad appeal.

Stage I has concluded with the finalization of sectors and use cases. Stage II will involve collaboration on use cases in sectors such as healthcare, disaster management, environment, transportation, and urban mobility.

2.5 Grant of Licenses

2.5.1 Access Services

Access Services wing facilitates licensees right from grant of licenses for multiple services to allocation of number resources to navigate complete life cycle during the license period. AS wing is also the Nodal wing for Trusted Source and Trusted Product Framework implementation. The Numbering Resource Management framework is an important and critical work of AS wing as this helps in smooth and orderly growth of Telecom sector.

The wing deals with grant, surrender and termination of licenses/authorizations/permissions for Access Service (AS), Access Service Cat-B, Captive Non-Public Networks (CNPN), In Flight and Maritime Connectivity (IFMC), multiple authorizations under the Unified License (UL) and UL (Virtual Network Operator), monitoring the operations and compliance of terms and conditions by the Access Service, Access Service Cat-B, CNPN, and IFMC licensees or permission holders. It includes:

- i) Grant, surrender and termination of licenses/authorizations/permissions for Access Service, Access Service Cat-B, CNPN, and IFMC.
- ii) Operational matters, including roaming facilities in border areas related to Access Service and IFMC licenses/authorizations.
- iii) Operational matters such as interconnection and tariff, in coordination with Telecom Regulatory Authority of India (TRAI).
- iv) Assignment of telecommunication identifiers including numbering resources to Access Service Providers.
- v) Monitoring the compliance of terms & conditions of licenses/authorizations/permissions including the compliance of minimum Roll-Out obligations.
- vi) Imposition of Liquidated Damages (LDs) on delayed compliance of minimum Roll-Out obligations.
- vii) Penalties on licensees for noncompliance of terms and conditions of licenses/authorizations.
- viii) Compliance monitoring of National Security Directive on Telecommunication Sector (NSDTS) in respect of licenses/authorizations in coordination with Director General (T).

- ix) Coordination with DG(T) for operational issues related to access service licenses/authorizations and IFMC.

Key milestones and achievements of AS wing as on 10.12.2024 are summarized below:

- i) A total of 127 license comprising 32 Unified Licenses, 92 Unified Licenses Virtual Network Operator (VNO), 01 IFMS and 02 CNPN licenses have been issued.
- ii) Allocation of various numbering Resources:
 - a) Short Code= 19
 - b) MSC Code= 223
 - c) M2M code= 30
 - d) LRN code= 4
 - e) SP code= 5
 - f) SCP code= 4
 - g) MCC-MNC code= 1
 - h) CNPN code= 1
 - i) Additional wireline codes= 27

2.5.2 Data Service

Total number of Internet Service Provider (ISP) licenses issued for the period 01.01.24 to 30.11.24 are 274 taking the cumulative count of active ISP Licenses (UL/UL-VNO/Standalone) as on 30.11.24 to 2695. The breakup is given below:

- i) 40 Standalone ISP Licenses has been issued which includes 12 Category "A" ISP authorization and 28 Category 'B' ISP authorization.
- ii) 1875 Unified Licenses with ISP authorization has been issued which includes 90 Category "A" ISP authorization, 731 Category 'Er' ISP authorization, 1054 Category "C" ISP authorization
- iii) 780 Unified Licenses (VNO) with ISP authorization have been issued which include 72 Category 'A' authorizations, 511 Category "B" authorizations and 197 Category "C" authorizations.

Ease of doing business has been enhanced by making the entire process of grant of ISP Authorization online. The Applicant companies desirous of getting the ISP Authorization under Unified License/UL-VNO are required to submit the application online on SARAL (Simplified Application for Registration and Licenses) SANCHAR portal. The entire process including the deposition of processing fee/entry fees etc. is online. The only physical interaction is when the applicant has to ink sign the license and there too the ISP license signing process has been decentralized at Field units of Department of Telecommunications (DoT). The licensee has to approach the nearest LSA office concerned for license signing. This resulted in tremendous saving of resources

of applicants in terms of travel time, travel expenditure and the process of obtaining License has expedited manifold.

Prime Minister's Wi-Fi Access Network Interface (PM-WANI):

The Government on 9th December, 2020, to accelerate proliferation of Broadband services through Public Wi-Fi networks in the country, approved the setting up of Public Wi-Fi Networks by Public Data Office Aggregators (PDOAs) and Public Data Offices (PDOs). This framework takes forward the goal of NDCP-2018 of creating a robust digital communications infrastructure across India. Proliferation of Broadband Services through public Wi-Fi networks is a step towards Digital India and consequential benefits thereon. This will encourage technology entrepreneurs to develop and deploy Wi-Fi technology solutions triggering Make in India. This new eco system will also enable new business models for shopkeepers as potential PDOs to provide high speed broadband services. No License Fee by PDOAs and Application providers for providing broadband services using public Wi-Fi Hotspots will encourage its proliferation and penetration across the length and breadth of the country. Availability and use of broadband will enhance incomes, employment, quality of life, ease of doing business, etc.

Further a slew of interventions in the existing PM-WANI Framework and Guidelines for Registrations has been issued on 16.09.2024 to address the issues relating to the proliferation of Public Wi-Fi Hotspots.

Under the PM WANI framework, online registrations of PDOAs and App providers began on 07.01.2021. As on 30.11.24, a total of 204 PDOAs and 111 App Providers have been registered with Central registry and total number of 2,47,028 Wi-Fi Hot Spots have been deployed by PDOAs.

2.5.3 Carrier Services

i) Audio Conferencing/ Audiotex/ Voice Mail Services

The Department of Telecommunications (DoT) issued a new licensing framework Audio Conferencing/ Audiotex/ Voice Mail Services (ACS/Audiotex/VMS) under the Unified License, along with modifications in the terms and conditions of the existing standalone license of “Voice Mail Service (VMS)/ Audiotex (ATS)/ Unified Messaging Services (UMS)”, which came into effect from 1st January 2022. The DoT incorporated a new chapter for this authorization to make this license part of the Unified License (UL), as per the TRAI's recommendations on licensing framework for Audio Conferencing, Audiotex, and Voice Mail Services. However, existing license holders of VMS/ Audiotex/ UMS licenses were given the option to migrate to the Unified License, and the migration was not mandatory. Existing license holders have started migrating to the new licensing regime under the Unified License, and the

industry has appreciated this initiative as it offers several advantages. During the period between 01.04.2024 to 29.11.2024, CS cell issued 03 authorizations under UL for ACS/Audiotex/VMS.

ii) Public Mobile Radio Trunking Service (PMRTS)

PMRTS is a form of mobile communication that allows users to communicate through a pair of radio frequencies assigned to the system from a designated frequency band. This License is mainly used to provide public mobile radio trunking service on a commercial basis and falls under the Unified License as of August 1, 2013. The service area for PMRTS is limited to metro or circle-wise regions. No new licenses were issued however 7 SDCA license merge/demerge between the period 01.04.2024 to 29.11.2024.

iii) Captive Mobile Radio Trunking Service (CMRTS)

CMRTS service is quite similar to PMRTS, with the only difference being that it is meant for captive use, whereas PMRTS is used for commercial purposes. The License for CMRTS is not included in the Unified License and is only issued by the Department of Telecommunications for captive use by agencies and companies like police, metro rail services, mining companies, etc. The service area for CMRTS is limited to metro/city/specific areas/locations. During the period between 01.01.2024 to 29.11.2024, CS cell issued 02 new licenses and 01 additional frequency license for CMRTS.

iv) No Objection Certificate for sale/rent of international Subscriber Identity Module (SIM)/ Global Calling Cards (GCC)

The DOT has issued the revised terms & conditions for issue/renewal of NOC for sale/rent of International Roaming SIM Cards/ Global Calling Cards of Foreign Operators in India on 14.01.2022. The revised terms & conditions strengthen the mechanism to protect the interests of the Indian public visiting abroad and also streamlines the procedures in line with the other licenses/registrations. The revised policy mandates the NOC holders to make provision for providing information regarding customer care service, contact details, escalation matrix, itemized bills, information related to tariff plans, services offered, etc. Provision has also been made to strengthen Billing and consumer grievance redressal mechanism to facilitate time bound resolution of grievance by the NOC holders with provision for Appellate Authority in DOT. Further, the revised policy also streamlines the application process/ other procedures for the NOC holders in line with the other licenses/ registrations etc. in the DOT and to facilitate the resolution/ management of the issues of the NOCs holders. During the period between 01.01.2024 to 29.11.2024, CS cell issued 10 new/renewed NOCs.

v) Licensing for International Long Distance (ILD) Service:

To introduce free competition, ILD Service was opened for private players in

April 2002. After the introduction of Unified Licensing Regime in 2013, the new Licenses to operate ILD service are being given as authorization under Unified License. Unified License (Virtual Network Operator) [UL-VNO] regime has also been introduced in 2016, under which ILD service authorization can be given.

vi) Operational issues of ILD service:

Apart from licensing of ILD service, DoT also coordinates with Law Enforcement Agencies (LEAs) for clearances to install ILD Gateways, Cable Landing Station (CLS) for international submarine cables, Remote Access (RA) of telecom nodes (ILD/ NLD) in India from foreign locations. Between 01.04.2024 to 31.10.2024, clearances have been given for 2 CLS. Coordination is also being done with MHA & MoD for granting clearances to foreign cable ships and foreign nationals deployed on such ships for survey work related to submarine cables and for maintenance of submarine cables. Between 01.04.2024 to 31.10.2024, 23 MHA clearances covering 4258 personnel and MoD clearances for 22 vessels have been granted.

vii) Licensing for National Long Distance (NLD):

To introduce free competition, NLD Service were opened for private players in August 2000. After the introduction of Unified Licensing Regime in 2013, the new Licenses to operate NLD services are being given as authorization under Unified License. Unified License (Virtual Network Operator) [UL-VNO] regime has also been introduced in 2016, under which NLD service authorization can be given. Between 01.04.2024 to 31.10.2024, 1 NLD License service authorization under UL has been issued.

viii) Licensing for Resale of International Private Leased Circuits (IPLC) Service:

With a view to promote competition and affordability in International Private Leased Circuits (IPLC) Segment, Government has permitted the Resale of IPLC and introduced a new category of License called as Resale of IPLC Service License with effect from 24th September 2008. The Reseller shall provide end-to-end IPLC between India and country of destination for any capacity denomination.

ix) Registration Certificate of Infrastructure Provider Category-I (IP-I):

Under IP-I registration, company can provide assets such as Dark Fibres, Right of Way, Duct Space, Tower for the purpose to grant on lease/ rent/ sale basis to the licensees of Telecom Services licensed under Section 4 of Indian Telegraph Act, 1885 on mutually agreed terms and conditions. Between 01.04.2024 to 31.10.2024, 71 companies have been registered as Infrastructure Provider Category-I.

2.5.4 Satellite Services

i) Satellite broadband services in the country through Low Earth Orbit (LEO)/ Medium Earth Orbit (MEO) of Non-Geostationary Orbit (NGSO) constellations:

For proliferation of broadband using LEO and MEO satellites, the Global Mobile Personal Communication by Satellite (GMPCS) service licenses have been granted to the following two companies:

- a) M/s One Web India Communications Private Limited, which is going to utilize OneWeb [LEO] Constellation.
- b) M/s JSCL (a Jio subsidiary), which is going to utilize O3B mPower SES [MEO] satellite constellation.

Further, some more companies have also shown interest/applied for GMPCS license for providing broadband using LEO satellites.

- ii) In-principle clearance for the satellite-based communication network:
 - a) Till now, the satellite has been mostly used to provide fixed services. DoT has enhanced the scope of the commercial Very Small Aperture Terminal (VSAT) license to enable the provisioning of User terminal station(s) on moving platform(s), for both vehicle-mounted “fully mobile” and briefcase size portable “pause and move” use. Satellite Division enabled the introduction of such satellite terminals as per latest Telecommunication Engineering Centre Interface Requirements (TEC IR). On the recommendation of the Interministerial Committee for Satellite Network Clearance (IMC-SNC), about a dozen new such satellite terminals have been given ‘in-principle clearance’. The remote terminals introduced include both the ‘Communication on the Move’ and ‘Communication on the Pause’ types.
 - b) On the recommendation of the IMC-SNC, DoT has issued 08 in-principle clearances for new network(s)/amendment to the existing network(s) to various licensees providing satellite-based communication services.

2.5.5 Network Technologies

- i) Machine To Machine (M2M) Services
 - a) In order to strengthen the M2M eco-system and to facilitate wider proliferation and innovation in the M2M/IoT sector, DoT issued guidelines for the Registration of M2MSP Service Providers and Wireless Personal Area Network (WPAN)/Wireless Local Area Network (WLAN) Connectivity Providers on 08.02.2022 and commenced the process of onboarding the M2M Service Providers through a simple online registration process on DoT’s SARAL SANCHAR portal. This registration

has helped M2M Service Providers to boost their business globally, as registration with DoT provides them recognition as registered entities with the Government of India. This registration also facilitates the Government to gather information on the various use cases of M2M/Internet of Things (IoT) being developed by the M2MSPs and helps in the adoption of one M2M standards-based deployment in the country.

- b) The scope of M2MSP and WLAN/WPAN connectivity provider registration has been extended to allow all types of business entities such as companies, Government Departments/Organizations, Partnership Firms, LLPs, Institutions, Undertakings, Proprietorship Firms, Societies and Trusts to apply for registration.
- c) DoT has issued instructions mandating the registration of M2M SP and WLAN/WPAN connectivity providers for M2M Services latest by 15.01.25. TSPs have been directed to suspend the services of M2M SIMs for M2M Services/Connectivity, issued to unregistered entities post 15.01.25.
- d) The details of number of registrations made with DoT is as under:

Sr. No.	As on	Count of Registrations
1	31.12.2023	256
2	31.03.2024	703
3	30.06.2024	1990
4	30.09.2024	2747

ii) Advanced Optical Communication Testbed:

DoT through Telecom Technology Development Fund (TTDF) has funded a project titled “Advanced Optical Communication Testbed” (AOC Testbed) with a grant of 169.95 crore. AOC Testbed is a consortium project with the participation of industry, academia and R&D. The project is led by the Indian Institute of Technology Madras.

- a) Consortium Members:
 - Academic Institutes: IIT Delhi, IIIT Delhi, IIT Madras
 - R&D Centre: ERNET
 - Industry partners: Singalchip, Signaltron, SFO Technologies, Sterlite Technologies, SASMOS HET Technologies and Quanfluence.
- b) Objective of the project:
 - Enable technologies for capacity scaling from Gigabits per second (Gbps) towards Petabits per second (Pbps), with the provision of a modular

testbed with field installations to support > 1 Tbps with a pathway to 1 Pbps.

- Promote indigenous development – devices, sub-systems, and networks for the testbed, compliant to standards, ready to market.
 - o create an ecosystem for Indigenous technology development,
 - o address both high volume and technologically niche products,
 - o establish national facilities – open to academia/industry for R&D
 - o provide platforms for IPR generation, contribution to standards and performance tests
 - o provide a platform to solve India-specific optical networking problems
 - o skill development and building a talent pool

c) Present Status:

- The project encompasses a total of 19 work packages and is expected to be completed by 2026. Of the allocated budget of Rs. 69.95 crore, Rs. 84.89 crore has already been disbursed. Steady progress is being made, with present status as under:
- Multicore fiber testbed implementation is in progress. The cables are being manufactured now and will be installed at IITM campus.
- Development of Fan-In Fan-Out (FIFO), optical frequency combs, and reconfigurable filters is in progress. Fress space optical communication (FSO) system prototype development with auto-tracking is in progress. Simulation set-ups and the initial tapering process are completed for the FIFO.
- Simulations were completed with 4 element array for Hybrid RF over Fiber (RFoF) Link between DU-RU for generation and transport of mm-wave signals. A high-resolution power meter is also developed. Printed Circuit Board (PCB) designs and thermal analysis are completed for 26 GHz RFoF WDM Transceiver. Simulations are also completed for AI enabled pre-emptive network control in Multiband Optical Networks project.
- Demo of 50Mbps with 35 ms Round-trip time (RTT) is completed for the Light Fidelity (LiFi) project. Developed Fress space optical communication (FSO) set-up, 2km, 10 Gbps, proto under development
- Quantum Key Distribution (QKD) network security: Software-defined networking (SDN) node agent-controller interfaces and Alice, Bob and Eve nods specs are finalized. QKD setup with Metro Area Quantum Access Network (MAQAN) testbed and study of Eve attack emulators is in progress.

- Workshops are organized as per plan at IITM, Chennai, and IIIT, Delhi. Outreach programs are conducted at various universities/colleges in Punjab, and in Jammu & Kashmir.
- Advanced Optical Communications (AOC) team is also advising BSNL on their Multi-Protocol Label Switching-Internet Protocol (MPLS-IP) based Access and Aggregation Network (MAAN) network, and amplifier options, testing the feasibility of using bidirectional transmission for a congested urban link and ongoing collaboration about network intelligence using historical monitoring data.

2.6 Telecom Security

The emerging trends in telecom security necessitates policy intervention and formulation of guidelines to secure telecom networks. This includes measures for monitoring and enforcement, thereof, through Security Assurance and Security-Policy, Planning & Intelligence (SPPI).

The SPPI (Security-Policy, Planning & Intelligence) is responsible for the policy guidelines & framework with respect to security and for interfacing with the Law enforcement/ Authorized agencies for telecom related support on security aspects. Facilitating Lawful interception and monitoring of communication messages by Law Enforcement/ Authorized agencies under section 5(2) of Indian Telegraph Act/ Section 20(2)(a) of The Telecommunications Act, 2023, administering rules related to Lawful interception. Matters related to Call Detail Records (CDR), foreign signal spillage across International border, Location based Service, review of vital security installations, policy matters related to Calling Line Identification Restriction (CLIR), issues relating to obtaining CDR by security agencies, conducting Lawful Interception System (LIS)/Lawful Interception Monitoring (LIM) and Remote Access demonstrations for Licensees. Matters pertaining to the upgradation of Rural Automatic Exchange (RAX) based phones with high end secure video phones, in coordination with MHA is also handled.

Further, the operationalization of projects of security of communications in the telecommunication network is also taken care of. This is achieved by undertaking the research & development of telecommunication security products and systems under emerging technologies like Quantum communication, handling of cyber vulnerabilities & incidences detected by TSOC and reported by various agencies, project facilitating lawful interception of telecommunications by the Law Enforcement Agencies and Security Agencies (LEA/SA). Matters are coordinated related to CMS, IMS and TSOC with field units, C-DOT, MHA, LEAs and organizations.

Further, Information Sharing & Response Portal (ISRP) has been developed which automatically pulls the reports of vulnerabilities from TSOC and forwards the same to the concerned organizations for mitigation. The organization concerned shares the action taken report through the portal itself.

2.6.1 Telecommunications (Procedures and Safeguards for Lawful Interception of Messages) Rules, 2024

DoT published The Telecommunications (Procedures and Safeguards for Lawful Interception of Messages) Rules, 2024 on December 6, 2024, within a short span of enforcing Section 20(2)(a) of the Telecommunication Act, 2023.

These rules replace the earlier Rule 419 and 419A of the Indian Telegraph Rules, 1951, which governed lawful interception procedures for stakeholders, including DoT, the Ministry of Home Affairs (MHA), Law Enforcement Agencies (LEAs)/ authorized agencies, and service providers/ telecommunication entities. The new framework has been structured to ensure greater uniformity while retaining all significant provisions from the earlier rules. This achievement underscores DoT's commitment to enhancing procedural clarity and aligning with contemporary regulatory requirements.

2.6.2 Citizen centric services and prevention of misuse of telecom resources

i) Sanchar Saathi portal

DoT has developed a citizen centric Sanchar Saathi portal (www.sancharsaathi.gov.in), which has about 8.5 crore visitors hits till December 2024 and on an average 2 lakh visitors per day land on this portal. The portal provides various facilities for reporting of cases related to misuse of telecom resources which are as under:

- a) to report suspected fraud communications and Unsolicited Commercial Communication (UCC);
- b) to know the mobile connections issued in their name and report the mobile connections for disconnection which are either not required or not taken by them;
- c) to report the stolen / lost mobile handset for blocking and tracing;
- d) to check the genuineness of mobile handset while buying a new/old device;
- e) to report the incoming international calls received with Indian telephone number as calling line identification.

ii) Digital Intelligence Platform (DIP)

DoT has launched an online secure platform i.e. DIP for sharing of information related to misuse of telecom resources among the stakeholders for prevention of cyber-crime and financial frauds. At present about 520 organizations including Telecom Service Providers (TSPs), MHA, 460 banks and financial institutions, 33 States/UTs police, central agencies and other stakeholders have onboarded this platform. This platform, inter-alia, hosts the list of disconnected mobile connections on near real time basis along with the reasons for disconnections enabling the stakeholders to take appropriate action including to disengage the associated services linked with these mobile numbers.

iii) अस्त्र (ASTR)

DoT has developed AI based tools called ASTR which help in identifying the mobile connections taken on fake / forged documents or taken exceeding the prescribed limits for an individual. Such mobile connections along with telecom resources and mobile handsets used in fraudulent activities are being weeded out from the telecom ecosystem.

iv) Outcomes:

Following are the outcomes of the actions taken by DoT:

- a) Disconnected 2.67 crore mobile connections taken fraudulently and involved in cybercrime. This includes 3 lakh mobile connections which were used in South East Asian countries for cybercrime.
- b) Pan India blocking of 2.4 lakh mobile phones involved in cyber-crime or fraudulent activities.
- c) About 14.3 lakh out of 23.9 lakh reported stolen/lost mobile phones have been traced.
- d) Disconnected about 20,000 entities, 32,000 SMS headers and 2 lakh SMS templates involved in sending malicious SMSs.
- e) About 11 lakh accounts have been frozen by the banks and payments wallets which were linked to disconnected mobile connections taken on fake / forged documents.
- f) About 12 lakh WhatsApp profiles/accounts have been disengaged by WhatsApp which were linked to disconnected mobile connections taken on fake / forged documents.
- g) 71,000 Point of Sale (SIM Agents) have been blacklisted. 365 FIRs have been registered in multiple States/UTs.

2.6.3 International Incoming Spoofed Calls Prevention System:



Launch of Prevention of International Incoming Spoofed Calls System by Hon'ble MoC in BSNL Corporate Office on 22.10.2024

DoT observed that fraudsters were making international spoofed calls to Indian citizens displaying Indian mobile numbers and committing cyber-crime & financial frauds. These calls appeared to be originating within India but were being made by the cyber-criminals from abroad by manipulating the calling line identity (CLI). Such international spoofed calls have been misused in recent cases of cyber-crime & financial frauds threatening disconnection of mobile numbers by DoT/TRAI officials, fake digital arrests, impersonation as government and police officials, arrest in sex racket etc.

DoT along with TSPs devised International Incoming Spoofed Calls Prevention System to identify and block such incoming international spoofed calls from reaching the Indian citizens. This system has been launched by Hon'ble Minister of Communications on 22.10.2024. The system has shown significant results with more than 70% of all the incoming international calls with Indian phone numbers being blocked by the system in the initial few weeks from reaching Indian telecom subscribers. This system is a preventive solution which is proving its effectiveness in protecting Indian citizens from the menace of cyber-crime and financial frauds.

2.7 Financial Matters

2.7.1 Asset Management:

The Asset Management (AM) Division is responsible for preparing and monitoring the overall asset management policy for the Department of Telecom and its related offices, as well as for Public Sector Undertakings (PSUs) under the administrative control of the DoT. The Asset Management Division is involved in the comprehensive monitoring of land and building asset monetization and related issues. Additionally, Asset Management is responsible for processing and obtaining the approval of the Union Cabinet, GoM (Group of Ministers), Alternate Mechanism, or PPPAC (Public-Private Partnership Appraisal Committee) for non-core & core asset monetization, in accordance with defined thresholds depending on the specific case. The AM Division also plays a coordinating role with the IMG (Inter-Ministerial Group), Cabinet Secretariat, CGAM (Core Group on Asset Monetization), and other Ministries concerning both core and non-core asset monetization, as well as the National Monetization Pipeline (NMP). In addition to the above there are other miscellaneous work related to asset management being performed by the division. The Division is mandated to perform as per Financial Advisers Charter issued by Ministry of Finance vide O.M No 23(3)/E. Coord/2018 dated 13.06.2023.

Pursuant to Cabinet decision on revival of BSNL/MTNL and target set for National Monetization Pipeline, monetisation of Core and Non-Core Assets of BSNL/MTNL has become very important work for the Asset Management Division of DoT.

Important Achievements & Targets to be achieved during 2024-25: -

- i) Monetisation of Non-Core Assets (Land and Building) of BSNL and MTNL. (Ongoing process).
- ii) BSNL/MTNL has achieved Rs. 1,375 Crore upto 31.10.2024 (62.5%) against a target of Rs. 2,200 Crore for FY 2024-2025. The target was set by CGAM through Niti Aayog for Monetization from all sources.

2.7.2 SARAS and License Fee Assessment:

- i) SARAS (System for Assessment of License Fee Revenue and Spectrum Usage Charges):
Digitalisation of the largest source of non-tax revenue to Government of India:
 - a) SARAS is the Revenue Management System (RMS) developed by DoT to ease, standardize and automate payment, assessment and reporting of telecom revenue and related ancillary processes covering life cycle of the licensee. The SARAS project has been envisioned with a goal to not

only digitize this process but to usher in a complete transparency of LF and SUC assessment & collection process along with deduction claim process, thereby, bringing in ease of doing business, accountability, transparency and efficient service delivery to the Telecom Industry.

- b) SARAS consists of 15 modules catering to different functionalities. Some of the major modules are LF payment and Assessment (LFA), Deduction Claim and Verification (DVR), SUC payment and Assessment (SUC), Other Dues Notice issuance and collection, Spectrum Auction Payment, No Dues Certificate, Bank Guarantee (BG), Knowledge Bank and Grievance.
- c) SARAS is integrated with the following external systems:
 - Bharatkosh for collection of payments
 - SMS/Email Gateway for sending out notifications to users.
 - E-sign for signing of documents by TSP users and DoT users.
- d) Current Status of SARAS – Milestones (as on 29th November, 2024) (since inception):

Total Licensees onboarded	2664
Total Licenses onboarded	4121
LF collection through SARAS (in Rs. Crore)	135862
SUC collection through SARAS (in Rs. Crore)	33384
Spectrum Auction Payment through SARAS (in Rs. Crore)	118260
Total number of Demands issued through SARAS.	12088
Adjusted Gross Revenue (AGR) submitted in SARAS (in Rs Crore)	10,58,239

i) License Fee Assessment:

- a) The trend of Gross Revenue (GR) and License Fee (LF) receipts for the FY 2011-12 to FY 2023-24 is given below:

S. No.	Financial Year (FY)	Gross Revenue (GR)	% change in Gross Revenue (from last year)	License Fee receipts
		(in Rs. Crore)		(in Rs. Crore)
1	2011-12	195442	-	11797
2	2012-13	212592	8.77	11456
3	2013-14	233815	9.98	14628
4	2014-15	254547	8.87	12358
5	2015-16	263709	3.60	15771
6	2016-17	274571	4.12	15614
7	2017-18	254538	-7.30	13262
8	2018-19	233633	-8.21	11134
9	2019-20	252825	8.21	39648
10	2020-21	273458	8.16	15274
11	2021-22*	278183	1.73	16614
12	2022-23	333697	19.96	20316
13	2023-24	336066	0.71	36363

*Telecom Reforms implemented from October-2021.

- b) Deduction verification process has been codified and Standard Operating Procedure (SOP) has been issued to ensure uniformity and standardization. DVR SOP has been issued vide order 31-2/2015/LFP dated 05/05/2022. This SOP will be applicable for deduction verification process pertaining to FY 2021-22 onwards.
- c) In order to educate the licensees with regard to the above developments and to address their queries/issues regarding license agreement compliance, thereby facilitate ease of doing business, Quarterly telecom outreach meets are being conducted by Pr.CCA/CCA offices all over India from October 2022 onwards.
- d) In order to ensure the timely completion of the LF assessment, timelines have been defined for the completion of assessment by assessing

authorities. Timelines for the License Fee assessment has been defined vide order 31-2/2015-LFP dated 27/09/2022.

- e) The License Fee Assessment and issue of demand notices up to FY 2022-23 has been completed.

2.7.3 Receipts Spectrum Usage Charges (SUC) & other receipts for FY 2023-24 is as under

(In Rs. Crore)

Nature of Receipts	Revenue Receipts in the Up to December 2024 (FY 2024-25) (in crore)	Anticipated receipts from January 2025 to March 2025 (in crore)
Spectrum Usage Charges (SUC) - CDMA+GSM+BWA+VSAT	2305.15	1194.85
Auction instalments/pre-payment receipts	30755.39	6242.35
Other Spectrum related receipts	388.98	211.02
Receipts from BSNL on account of cost of administratively allotted Spectrum	10697.17	52372.73
Grand Total	44146.69	60020.95

2.7.4 Wireless Planning Finance

DoT has conducted auction of spectrum in 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands in June, 2024. Highlights of the auction are mentioned below:

- The spectrum expiring in 2024 and the unsold spectrum of previous Spectrum Auction held in 2022 were put to auction in June'2024 to meet spectrum requirement of Telecom Service Providers (TSPs) for continuity & growth of the services.
- Total 10522.35 MHz spectrum in 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz bands was put to auction. The auction saw activity in 900 MHz, 1800 MHz, 2100 MHz and 2500MHz bands.
- A total quantum of 141.4 MHz spectrum of worth Rs. 11,340 Crore was sold among the successful bidders.
- Out of total quantum of 141.4 MHz spectrum, share of spectrum sold in respect of M/s Bharti Airtel Limited, M/s Reliance Jio Infocomm Limited

and M/s Vodafone Idea Limited was 97MHz, 14.4MHz & 30MHz respectively.

- v) Out of total spectrum worth of Rs. 11,340 Crore, share of spectrum worth in respect of M/s Bharti Airtel Limited, M/s Reliance Jio Infocomm Limited and M/s Vodafone Idea Limited was Rs. 6856.76 Crore, Rs. 973.62 Crore and Rs3 510.40 Crore respectively.

2.7.5 Foreign Investment Policy and Promotion

Total Foreign Direct Investment (FDI) inflow into telecommunications sector during April, 2000 to September, 2024 was Rs. 2,40,440 Crore. Telecommunications is the fourth largest sector in terms of FDI equity inflows after Services Sector, Computer Software and hardware sector & Trading Sector as given in table below:

**Table: Top Four sectors attracting FDI Equity Inflows
(Amount in Rs. Crores)**

Rank	Sector	2022-23 (April-March)	2023-24 (April-March)	2024-25 (April-Sept)	Cumulative inflows(April 2000 to September, 24)	%age to Total Inflows
1	Services Sector *	69,852	54,894	47,540	7,34,419	16%
2	Computer software and hardware	74,718	66,090	35,025	7,53,894	15%
3	Trading	38,060	32,080	22,800	3,22,059	7%
4	Telecommunications	5,469	2,318	5,600	2,40,440	6%

Source: FDI Factsheet dipp.gov.in

* Services sector includes Financial, Banking, Insurance, Non-Financial / Business, Outsourcing, R&D, Courier, Tech. Testing and Analysis, Others.

From data it is evident 2023-24 saw a decline in FDI inflows to Rs. 2,318 Crore compared to Rs. 5,469 Crore in 2022-23. However, 2024-25 (for the first half-year) experienced a sharp increase in FDI, reaching Rs. 5,600 Crore, which is higher than both 2022-23 and 2023-24.

FDI is a key component for rapid economic growth and an important vehicle for the transfer of technology. It also brings with it considerable benefits through raising productivity, strengthening infrastructure, enhancing competitiveness of the domestic economy and generating new employment opportunities. The

telecom sector also helps other sectors to grow through diffusion of information, innovation and ideas. Since the telecommunications industry is capital intensive and heavily dependent on technology, FDI in telecom holds the promise of accelerating growth of the sector. FIPP wing has processed some important license application like Mrs Orange Business Services India Network Private Ltd, M/s Bharti Telemedia Limited, M/s Yotta Services Private Limited, M/s Five9 Technologies India Private Ltd. etc.

2.7.6 Budget:

i) Important Responsibilities:

- a) Budget Section is mainly responsible for preparation of the Annual Budget of the Department in the form of Detailed Demands for Grants (DDG), as stipulated under Article 114 of the Constitution of India. The DDG is prepared in consultation with Budget Division of the Department of Economic Affairs, Ministry of Finance. It is then submitted for approval to Parliament. The Section also prepares Supplementary and Excess Demands for Grants, whenever the need arises, as stipulated under Article 115 of the Constitution.
- b) The Section prepares Budget Brief with regard to examination of the DDG by the Parliamentary Standing Committee on Communications & Information Technology. In this regard, replies to List of Points/Supplementary List of Points received from the Lok Sabha Secretariat are collated/prepared by the Section.
- c) Action Taken Notes (ATNs) on the Recommendations made by the Parliamentary Standing Committee in respect of the DDG are collected from all the divisions of DOT and then collated by Budget Section.
- d) Preparation of Statement of Hon'ble Minister under Direction 73 'A' of Speaker, Lok Sabha and under Direction 35 of Chairman, Rajya Sabha is done by the section.
- e) Co-ordination with Lok Sabha Secretariat for laying of OOMF (Output Outcome Monitoring Framework) of the Financial Year in Lok Sabha after its authentication by Hon'ble MoSC.
- f) Budget Section is also responsible for monitoring of Non-Tax Revenue collections of the Department. The details of which are as follows:

(Rs. In Crore)

NTR Receipts	Actual Receipts 2023-24	BE 2024-25	Actual Receipts up to 02.12.2024
Total License Fee	36363.17	25501.00	13964.43
Total Spectrum	56314.96	84366.31	40468.06
Other Receipts (Including receipts awaiting transfer)	-2018.87	400.00	-583.15
Total Receipts	90659.26	110267.31	53849.34

- g) Monitoring and up-dation of status of Budget Announcements made in the Budget Speech by Hon'ble Finance Minister is also under the purview of Budget Section.
- ii) Budget at Glance Statements:
- a) The following table shows the Gross Budget under Revenue and Capital Sections.

(Rs. In Crore)

Section	Actual Expenditure 2023-24	BE 2024-25	Actual Expenditure up to 02.12.2024
Revenue	33067.19	38475.54	24526.52
Capital	62455.72	93152.44	7372.62
Total	95522.91	131627.98	31899.14

b) The following table shows the Gross Budget under Revenue Section.

(Rs. In Crore)

Particulars	Actual Expenditure 2023-24	BE 2024-25	Actual Expenditure up to 02.12.2024
USOF (Other than Bharat Net)	5276.48	10100	2947.85
USOF R&D	28.48	400	92.56
Transfer to Reserve Fund (USOF)	1000	1000	1000
C-DOT	590	500	374.99
Pension	17391.79	17510	13796.38
Salaries	296.66	427.22	222.93
Incremental Pension payment to voluntarily retiring employees of BSNL and MTNL	2127.42	0.01	733.57
Grant in aid to BSNL for payment of GST on 4G Spectrum	2218	0	0
TRAI	112	100	71
Principal on MTNL Bonds	865	3668.97	3668.97
Interest on MTNL Bonds	383.22	311.74	302.48
PLI Scheme	291.63	1806.34	13.75
VGF to BSNL	1200	1200	1200
Waiver of Guarantee Fee	239.48	556.37	169.76
Others	1047.03	894.89	515.61
Total (Gross)	33067.19	38475.54	24526.52

c) The following table shows the Gross Budget under Capital Section.

(Rs. In crore)

Particulars	Actual Expenditure 2023-24	BE 2024-25	Actual Expenditure up to 02.12.2024
OFC Network for Defence Services (NFS)	1093.44	0	0
USOF (Bharat Net)	3075.54	8500	2191.78
Transfer to Reserve Fund (USOF)	1000	1000	416.67
Equity infusion for ITI Revival	0	168	0
Capital infusion in BSNL/MTNL	56785.04	82916.2	4619.03
TRAI Building	199.9	10	0
Digital Intelligence Unit(DIU)	50	85	29.25
Others	251.8	473.24	115.89
Total (Gross)	62455.72	93152.44	7372.62

2.7.7 Licensing Finance Policy (LFP)

Key Initiatives & Achievements:

- i) Providing inputs to framing of rules under different sections of Telecommunications Act, 2023.
- ii) Regular monitoring and follow up with O/o CGCA on cases of financial compliance of more than 2500 licensees.
- iii) Handling and Management of 246 legal cases related to financial conditions of license agreement in TDSAT, Supreme Court and insolvency matters of telecom licenses in NCLT/NCLAT.
- iv) Examination of 6 TRAI recommendations related to licensing policy and providing inputs on decision related to them.
- v) Around 700 files (till October, 2024) related to issue of new licenses / show cause notices / surrender / termination were examined in financial perspective.

2.7.8 Disbursement of terminal benefits

- i) SAMPANN (System for Accounting and Management of Pension):

Comprehensive Pension Management System (CPMS) developed under the brand SAMPANN-CPMS was inaugurated by Hon'ble Prime Minister on 29th December, 2018 at Varanasi. SAMPANN integrates the processing, sanctioning, authorization and payment units under a common platform, facilitating direct credit of pension to the accounts of pensioners. SAMPANN serves more than 4.37 lakh Pensioners by generating e-PPOs with an annual disbursement of approx. Rs. 13770.88 crore.

The benefits of SAMPANN are direct disbursement of pension on timely basis without intermediaries, Single window system of complete pension process, Online grievance management, tracking of pension status from home, and downloading documents like e-PPO, revision authority, pension slip etc.

- ii) National Pension Scheme (NPS)

The annual Conference on Implementation of NPS in Central Government was held on 27th August 2024 and DDG Accounts, under DoT, has been declared as the Best Performer in the category "effective implementation of NPS activities as per laid down system & process for the beneficial interest of underlying subscribers" among all the 58 Ministries/Govt. department second time in a row.

- iii) Other Key Initiatives

In line with the digitization of Government processes, Central

Government has decided to introduce 'e-bill' system in Central Government/Departments for End-to End digital processing and payment of claims/invoices received from claimants like vendors/agencies/Government employees, developed in PFMs. The new system involves a Business Process Re-engineering (BPR) by leveraging the information Technology in Central Government System to transform the entire payment process in the paperless concept. The e-bill system aims to reduce the payment cycle time and enhance transparency and efficiency in Government payment system.

One part of the e-bill module i.e. e-bill processes in GeM procurement/GeM bills has been implemented in all 32 PAOs of DOT and is functioning smoothly. Some technical issues on mapping of PD Codes, integration of e-HRMS with e-Bill Module etc are under development at O/o Controller General of Accounts (CGA). Once these are resolved and e-Bill module is fully implemented, will enable processing of e-claim, e-sanction and e-bill for payment and accounting by PAOs in the Department. The claims, sanctions, bills and supporting documents need to scanned and uploaded in the system while creating sanction. Roll out of e-Bill of PFMS system will enhance transparency, efficiency and faceless-paperless payment system. Moreover, payments are trackable on a real time basis. This system will reduce discretion in processing of bills through the "First-In-First-Out" (FIFO) method. Till such time, e-bill system is stabilized, manual/physical bills will also be processed in PFMS.

2.7.9 Integrated Finance Division (IFD)

- i) IFD is making sustained efforts to identify products that are not currently available on GeM and then to get them included.
- ii) IFD's commitment to facilitate procurement through GeM is reflected by regular organization of training sessions and workshops for procuring authorities. The consistent efforts have resulted in significant improvement in GeM Utilization Ratio (GUR%) of DOT units. For instance, in DOT units, the procurement ratio has surged to an impressive upward trend across all units (excluding PSUs). Further, there has been substantial increase in procurement through GeM in Public Sector Undertakings (PSUs) as well, reflecting the positive impact of these initiatives. IFD has also focused on reducing the pending bill payments on GeM. The efforts of IFD have played a pivotal role in streamlining and enhancing the efficiency of procurement processes through GeM.

2.8 Monitoring of Indices – Key Achievements

2.8.1 Network Readiness Index (NRI)

India has made significant strides in the global digital landscape, evidenced by its improved ranking in Network Readiness Index (NRI) 2024, where the country now stands 49th position up from 60th in 2023 report. This remarkable leap of eleven positions reflect India's growing role as a leader in digital transformation, driven largely by robust government initiatives. The NRI 2024 evaluates the network readiness of 133 economies based on four key pillars: Technology, People, Governance and Impact and uses a wide range of 54 variables to determine ranking.

India's improved score of 53.63 (up from 49.93 in 2023) underlines the country's enhanced technological, governance, and infrastructural capabilities. The country's rise in the rankings is a direct result of government policies and strategic initiatives aimed at boosting connectivity, innovation, and digital services across all sectors of the economy. India achieved, 1st Rank: AI Scientific Publications, AI Talent Concentration and ICT Services Exports, 2nd Rank: FTTH (Fiber to the Home) / Building Internet Subscriptions, Mobile Broadband Internet Traffic within the Country, International Internet Bandwidth, 3rd Rank: Domestic Market Scale, 4th Rank: Annual Investment in Telecommunication Services.

India has also ranked 2nd among lower-middle-income countries, showcasing its leadership in digital advancement within its income group. These achievements reflect India's growing dominance in technological innovation, artificial intelligence, and the telecommunications sector.

2.8.2 Data Governance Quality Index (DGQI)

DGQI exercise was initiated in 2020 by DMEO (Development Monitoring and Evaluation Office), NITI Aayog and NIC/NICSI, to assess data preparedness of Ministries/Departments (M/Ds) on a standardized framework to drive healthy competition among them and promote cooperative peer learning from best practices.

In DGQI 2.0 report for Q3 of 2022-23, DoT's score improved from 3.48 to 4.37 out of 5. Further, DoT's score in Q4 of 2022-23 improved to 4.42 out of 5.0.

2.9 Research & Development

2.9.1 Implementation of 100 5G Labs Initiative:

100 5G Use Case Labs are to be implemented at Academic Institutions for capacity and developing innovative use cases. SRI division is working as a Project Monitoring Unit (PMU) for the implementation of 100 5G Use Case Labs. TCIL is selected as Implementation Agency (IA) for this project. The main objectives of this initiative are:

- To build competencies and engagement in 5G technologies in students and academic fraternity.
- To enable projects at Under Graduate (UG) and Post Graduate (PG) level for students using 5G environment.
- To encourage academia-industry engagement to ideate and develop 5G use cases.
- To Provide local access to 5G test setup for Startups and MSMEs around the institution.
- Making Indian academia & Startup ecosystem 6G ready.

100 Institutions for hosting of the labs and four (4) vendors for installation of the labs was finalized by TCIL. All the labs have been installed in the institutes. Currently, User Acceptance Testing (UAT) of the labs are ongoing and is expected to be completed by 31st January 2025.

For effective utilization of the labs, SRI division, in coordination with NCA (National Communication Academy) Ghaziabad, organized a one-day workshop on October 16, 2024 at IMC 2024 event for faculty members from 100 institutions where 5G labs are being setup by DoT. The workshop aimed to equip faculty with practical knowledge on utilizing 5G Use Case Labs for innovation and research. This unique initiative will foster innovation across various socioeconomic sectors like education, agriculture, health, power, transportation etc, and propel the country into the forefront of usage of 5G technology. The initiative is also a pivotal step for building a 6G-ready academic and start-up ecosystem in the country.

The workshop provided a platform to explore 5G network transformation, industry applications, and opportunities for contributing to global standards development. Renowned speakers from academia, industry, and government shared valuable insights with attendees. Faculty from 75+ institutions having 5G Use Case Labs attended the workshop and gained knowledge on effectively leveraging the labs set up at their respective institution.

2.9.2 5G/6G Hackathon to Propel Next-Generation Innovations:

DoT launched the "5G and 6G Hackathon" on August 29, 2024, to identify and promote innovative applications relevant to India in the domains of 5G, 6G, and emerging technologies. Participants were encouraged to develop products and solutions addressing areas such as AI-driven network maintenance, 5G broadcasting, real-time control of advanced drones, multimodal interactive systems, non-terrestrial networks, and digital twins, among other use cases.

The hackathon was open to individuals, students, start-ups, and academic

institutions across India. Over 550 applications were received through the online portal. The hackathon was conducted in two phases. The first phase involved online evaluations, where selected applicants were invited to refine and showcase their solutions at a 30-hour physical hackathon held on September 26–27, 2024, across three established 5G lab locations in Delhi, Hyderabad, and Bangalore.

During the event, participants presented their solutions to a jury, received valuable feedback for further enhancements, and refined their ideas in real time. A total of 15 winning teams were selected and given the prestigious opportunity to showcase their solutions and products at the India Mobile Congress (IMC) 2024.

2.9.3 Centre of Excellence (CoE) in Quantum Technology, 5G/6G technologies at VTU-VRIF:

A Memorandum of Understanding (MoU) was signed between the Telecom Centre of Excellence (TCOE) India and Visvesvaraya Technological University (VTU) – Visvesvaraya Research & Innovation Foundation (VRIF) to establish a Centre of Excellence (CoE) in Quantum Technology, 5G/6G technologies, and other frontier research areas.

The CoE will follow a hub-and-spoke model, with VTU-VRIF and TCOE as the central hub, drawing on the expertise of VTU's affiliated colleges. It will foster research in Quantum and associated 5G/6G technologies, and promote collaboration between key telecom organizations like TEC, Bharat 6G Alliance, and TSDSI. With over 400,000 students and 2,000+ PhDs in VTU's network, the CoE aims to streamline R&D efforts and drive the commercialization of innovations in telecom and related fields.

2.9.4 Organization of Workshop on Telecom Standardization:

SRI Division, in collaboration with the Telecommunications Standards Development Society, India (TSDSI) and the Telecommunication Engineering Centre (TEC), organized a full-day Telecommunication Standardization Workshop on May 8, 2024, at the IIIT Bangalore campus. The workshop witnessed physical participation from approximately 120 attendees and online participation from around 300 participants.



Telecommunication Standardization Workshop on May 8, 2024, at the IIT Bangalore campus

The workshop focused on enhancing India's contributions to upcoming standardization activities, particularly in generating more intellectual property rights (IPRs), technical contributions, and standard essential patents (SEPs) for 6G technology. The event brought together startups, academia, industry members, and government organizations to explore and discuss various strategies for increasing India's involvement in telecommunications standardization.

2.9.5 Launch of portal for Ericsson Educate Program:

The Ericsson Educate Program, launched under the 100 5G Use Case Labs initiative in collaboration with TCoE India, is providing courses to 10,000 students from 100 institutes. Ericsson unveiled a portal on 30.04.2024 for student enrollment in the program. This collaboration focuses on enhancing capacity building and skill development within the 100 5G use case labs. It empowers institutes to guide students and faculty in developing innovative 5G products and use cases. Currently, 4000+ students have been onboarded and 827 students are actively pursuing the course.

2.9.6 Centre of Excellence (CoE) for 6G at IIT Madras:

A Centre of Excellence (CoE) on "Classical and Quantum Communications for 6G" has been established at the IIT Madras Research Park, Chennai, inaugurated by the Secretary (Telecom) on July 19, 2024. This CoE is a sub-centre of the Telecom Centres of Excellence (TCoE) India and aims to lead the development and deployment of 6G technologies, offering groundbreaking advancements in speed, ultra-low latency, and enhanced connectivity.



Inauguration of Centre of Excellence (CoE) on "Classical and Quantum Communications for 6G" at the IIT Madras Research Park, Chennai

In March 2023, Hon'ble Prime Minister Shri Narendra Modi launched the Bharat 6G Vision, positioning India as a global leader in designing, developing, and deploying 6G technology by 2030. To accelerate this vision, project proposals were invited under the "Accelerated Research on 6G Ecosystem" initiative. A total of 471 proposals were received, of which 111 have been approved for funding after rigorous technical evaluation, while 32 are under review.

The CoE at IIT Madras will act as a hub of innovation, fostering collaboration between academia and industry experts on pioneering projects. It will serve as a catalyst for developing novel applications and services that leverage the unique capabilities of 6G. Additionally, the centre is poised to play a pivotal role in shaping global standards and establishing the infrastructure required for a robust 6G ecosystem.

The CoE will also enable seamless integration with the existing 5G Test Bed at IIT Madras, which was indigenously developed through a collaborative effort involving eight institutes and funded by the Department of Telecommunications (DoT). This integration will bridge current 5G advancements with upcoming 6G research and development efforts, paving the way for India's leadership in next-generation telecommunications.

2.9.7 Center of Excellence (CoE) for Telecom Security at NFSU (National Forensic Sciences University) Gandhinagar

A MoU was signed between TCoE India and NFSU Gandhinagar on 25th July 2024 for setting up of Centre of Excellence on Telecom Security.

The MoU aims to strengthen the nation's cyberspace by securing the telecom network. The CoE's primary objective is to conduct research on vulnerabilities within the telecom sector and develop an Indian telecom network security stack to bolster the security of the country's communication infrastructure.



Signing of MoU between TCoE India and NFSU Gandhinagar on 25th July 2024 for setting up of Centre of Excellence on Telecom Security

This CoE will serve as a collaborative platform, bringing together experts from academia, industry, and government to drive innovation in telecom security. It will also play a vital role in supporting startups and emerging ventures, enabling the development of cutting-edge algorithms, techniques, and products in the telecom security domain.

2.9.8 MoU signed between TCoE (Telecom Centre of Excellence) India and NFSU (National Forensic Sciences University) Goa setting up of a Malware Lab.

TCoE India, from the DoT side, has signed an MoU with NFSU Goa on 25th July 2024 for setting up a Malware Lab. The lab is designed to foster research and capacity building in malware analysis specific to the telecommunications sector. Its primary objectives include generating threat intelligence reports to benefit academia and industry and strengthening the security of India's critical telecom infrastructure.

In addition to enhancing research and development capabilities, the lab will focus on capacity building, equipping professionals and stakeholders with the tools and knowledge to address emerging cybersecurity threats in the telecom domain.

CHAPTER 3

INTERNATIONAL RELATIONS AND INVESTMENT PROMOTION

CHAPTER 3

INTERNATIONAL RELATIONS AND INVESTMENT PROMOTION

Telecommunications by definition cuts across borders of different countries. Active participation and cooperation in this area is critical keeping in view the technology intensive nature of this sector. Accordingly, India has been proactively participating in Multilateral and bilateral forums. Similarly, India has also been cooperating with different countries and industrial and professional bodies.

3.1 International Relations

There were significant activities in bilateral cooperation as well as multilateral cooperation with Intergovernmental Organizations such as International Telecommunication Union (ITU), Asia-Pacific Telecommunity (APT) etc. Bilateral relations and technological cooperation were strengthened. The activities on International Relations front are summarized as below.

3.1.1 High Level Meetings:

i) Meeting with Minister of Communications, South Africa:

A meeting between Hon'ble Minister of Communications, India and Minister of Communications and Digital Technologies, South Africa was held on 14th Oct, 2024 in Bharat Mandapam. During the meeting discussions were held for collaboration on telecommunications/ Information and Communication Technologies (ICTs) between both the nations.



Meeting between Hon'ble Minister of Communications, India and Minister of Communications and Digital Technologies, South Africa.

- ii) Meeting with Secretary General, International Telecommunications, Union (SG, ITU)

A meeting between Hon'ble Minister of Communications, India and Secretary General, ITU was held on 14th October, 2024 in Bharat Mandapam. During the meeting discussions were held for strategic collaboration between India and ITU and ICT growth in India.

- iii) Meeting with Ambassador Republic of Germany, India:

A meeting between Hon'ble Minister of Communications, India and German Ambassador was held on 23rd October, 2024 at Sanchar Bhawan, New Delhi. The agenda of the meeting was to discuss the issues faced by the German companies in India.

- iv) Meeting with Secretary of State, Poland:

A meeting between Hon'ble Minister of State for Communications, India and the Polish delegation headed by Secretary of State, Poland was held on 15th October, 2024 at Bharat Mandapam, New Delhi.

The agenda for discussion included key topics for World Telecommunications Standardization Assembly (WTSA)-24, such as the metaverse resolution, e-waste management, and the multilingual nature of the internet, mutual support for the upcoming ITU elections (PP-2026) in Qatar, exchange on digital ID application mObywatel, the use of satellite systems for crisis management and addressing telecom service and the pathway towards 6G technology.

Additionally, investment collaboration, particularly concerning recent Indian investments in Poland by Tata Consultancy Services and HFCL and cooperation in cybersecurity were discussed.

- v) Meeting with Director General, Global System for Mobile Communications (GSMA):

A meeting between Hon'ble Minister of State for Communications and GSMA delegation headed by Deputy General, GSMA was held on 16th October, 2024 at Bharat Mandapam, New Delhi.

During the meeting discussions related to MWC Barcelona, India Mobile Congress and initiatives of GSMA and DoT in the field of ICTs were held.



Meeting between Hon'ble Minister of State for Communications and GSMA delegation.

vi) Meeting with Secretary General, International Telecommunications Union (SG, ITU)

A meeting between Hon'ble Minister of State for Communications and the ITU delegation headed by the Secretary General (ITU), was held on 17th October, 2024 at Bharat Mandapam, New Delhi. During the meeting discussions were held on collaboration between India and ITU in field of ICTs.

vii) Meeting with Deputy Minister, Zimbabwe:

A courtesy meeting between Hon'ble Minister of State for Communications, India and the Zimbabwean delegation headed by their Deputy Minister. was held on 23rd October, 2024 at Bharat Mandapam, New Delhi.

3.1.2 Other engagements

i) Meeting with British High Commissioner to India (BHC):

A meeting between Secretary Telecom and British High Commissioner was held on 6th September 2024 at Sanchar Bhawan, New Delhi. Discussions were held related to UK-India Technology and Security Initiative, telecom security, Mutual Recognition Agreement (MRA), Rip and Replace methodology in UK etc.

ii) Meeting with U.S.-India Business Council (USIBC):

A meeting between USIBC delegation and DoT delegation led by Secretary(T) was held on 17th Sept, 2024 in Sanchar Bhawan. The agenda of the meeting was discussion on India Telecom Policies, Laws, and Regulations, India's Telecom Hardware Manufacturing Ecosystem,

Agenda for the Next ICT Working Group and Initiative of Critical Emerging Technology (iCET) Discussion on Advanced Communications, WTSA and Opportunities for Commercial Satcom and Integration for the Space/Terrestrial Telecom Environment.

iii) Meeting with DG, Swedish Post and Telecom Authority, Sweden:

A meeting between Secretary (Telecom), DoT, India and the Swedish delegation headed by D-G, Swedish Post and Telecom Authority was held on 14 October, 2024 at Bharat Mandapam, New Delhi. The agenda of the meeting was planning of holding JWG between India and Sweden.

iv) Meeting with Deputy Minister of High-Tech Industry, Armenia:

A meeting between Secretary (Telecom) and the Armenian delegation headed by Deputy Minister of High-Tech Industry of the Republic of Armenia was held on 14 October, 2024 at Bharat Mandapam, New Delhi. The agenda of the meeting was enhancing collaboration between India and Armenia in field of telecommunications and ICTs.

v) Meeting with Ambassador at Large, US:

A meeting between Secretary(T), DoT, India and the American delegation led by Ambassador at Large, US was held on 14 October, 2024 at Bharat Mandapam, New Delhi. The agenda of the meeting as to discuss priorities for WTSA, including proposals of India and US.

vi) Meeting with Deputy Minister of Turkey:



Meeting between Deputy Minister, Turkey and Secretary(T)

A meeting between Deputy Minister, Turkey and Secretary(T) was held on 17th October, 2024 at Bharat Mandapam, New Delhi. The agenda of the meeting was to evaluate the developments in the ICT sector, meet on common grounds, explore mutual interests and exchange views in order to improve bilateral relations.

- vii) Meeting with Deputy Secretary General, International Telecommunications Union (DSG ITU):

A meeting between Secretary(T), DoT and DSG (ITU) was held on 19th October, 2024 in New Delhi to discuss the potential collaborations between ITU and DoT on upcoming cross-cutting technologies and development of these technologies.

- viii) Meeting with UAE delegation:

A meeting between the DoT Delegation, led by Additional Secretary (Telecom) and UAE Delegation was held on 16th October 2024 at Pragati Maidan. The agenda of the meeting was to discuss about the issues caused by panic button in Indian handsets roaming in UAE or being used in UAE by Indian tourists.

- ix) Meeting with Director General, GSMA:

- a) A meeting was held between Secretary (Telecom) and Director General, Global System for Mobile Communications (GSMA) on 9 May, 2024 in Sanchar Bhawan, New Delhi. The following broad points were discussed:
 - DoT's feedback on Mobile World Congress (MWC) Barcelona 2024.
 - Investment gap in the telecom sector.
 - Active engagement of GSMA during IMC 2024 planned on side lines of WTSA 2024
 - 5G Roll out and use case in India
 - Collaboration in different areas of mutual interest
- b) A bilateral meeting between Additional Secretary (T), and Director General of GSMA was held on 16th Oct, 2024 at the sidelines of WTSA to discuss the collaboration in telecom.

- x) Meeting with El Salvador:

A meeting between El Salvador delegation led by Advisor to President of El Salvador and DoT delegation led by Member (Services) was held on 18th April, 2024 in Sanchar Bhawan, New Delhi. This meeting was held to assist El Salvador side for their ICT initiatives in their country like proliferation of 4G/5G network, Cell Broadcast Technology, Telecom Security etc.

- xi) Meeting with FCC (Federal Communication Commission), FAA (Federal Aviation Administration) of USA:

A bilateral meeting between FCC (Federal Communication Commission), FAA (Federal Aviation Administration) of USA and TEC (Telecom Engineering Centre), DoT was held on 30 August, 2024 virtually, for discussion about standards of Radio Altimeter Interference mitigation and Anti-Drone systems.

- xii) Meeting with Director Communication Network, content and Technology (CNECT), Europe:

A review meeting on European Union EU-India Trade and Technology Council (TTC) Working Group-I was co-chaired by Joint Secretary MeitY and Director CNECT, EU on 25th July 2024 through virtual mode. Discussion on Telecommunication and IT standardization were held with International Relations Division, DoT. Deliberations were made on the updated status of Telecommunication and IT standardization, which included four action points as below:

- a) MoU between Bharat 6G alliance and 6G IA,
- b) MoU between National Centre for Communication Security DoT & European Union Agency for Cyber Security ENISA
- c) Collaboration between ORAN with C-DoT and
- d) Organization of a joint workshop to facilitate exchange of best practices in telecom and ICT standardization.

- xiii) Meeting with Taiwan:

An Inter-Ministerial Bilateral meeting of Industrial Cooperation Working Group (ICWG) with Taiwan was held on 10.07.2024 in Vanijya Bhawan, New Delhi. The meeting was co-chaired by Joint Secretary, DPIIT. The opportunities in "Investment and Collaboration" in emerging sectors like 5G use cases, PLI Scheme etc. from DoT side were discussed.

- xiv) 8th meeting of India-Myanmar Joint Trade Committee:

The 8th meeting of India-Myanmar Joint Trade Committee (JTC) was hosted by India in Vanijya Bhawan, New Delhi. The meeting was co-chaired by Joint Secretary, Department of Commerce, Ministry of Commerce and Industry, India. It was an interministerial meeting. Department of Telecom participated in this meeting. Potential collaboration in 5G Technology was discussed.

- xv) India Japan Industrial Competitiveness Partnership (IJICP) meeting:

The 6th meeting of India Japan Industrial Competitiveness Partnership

(IJICP) at Secretary-Vice Minister Level was held virtually on 28 June 2024 in Vanijya Bhawan, New Delhi. Meeting was chaired by Secretary, Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry from Indian side and co-chaired by Vice-Minister for International Affairs, Ministry of Economy, Trade and Industry from Japan side. Delegation from 12 Ministries took part in this meeting. DoT updated the latest progress of collaboration and presented the potential area of collaboration with Japan in future.

Outcomes of these meetings:

India has significantly deepened its global ties and cooperation in the telecom sector through a series of high-level bilateral meetings with various countries. These engagements have provided a platform to showcase India's indigenous 4G/5G stack, underscoring the country's self-reliance and innovation in telecom technology. Key discussions included visits to the CDOT Innovation Centre, where international delegations were introduced to India's pioneering Early Warning System and ORAN technology, which is helping create more open and interoperable networks globally. Additionally, these meetings facilitated collaboration on 5G use cases, enabling joint efforts on deploying advanced telecom solutions across sectors such as healthcare, agriculture, and smart cities. Further enhancing India's role as a global telecom leader, the meetings also focused on cooperation in 6G and quantum communications, setting the foundation for future technologies.

Through these partnerships, India has strengthened its global telecom leadership, promoting not only technological advancements but also collaborative efforts to shape the future of the global telecom ecosystem.

Through strategic bilateral meetings, the Bharat 6G Alliance (B6GA) has signed several key MoUs with prominent global entities to bolster India's position in the evolving telecom sector. These collaborations focus on advancing research and development in 6G technologies, promoting secure telecom solutions, and contributing to global telecom standards.

Key partnerships include:

- i) NextG Alliance (USA) - Advancing wireless technology leadership and fostering secure telecom solutions.
- ii) 6G Smart Networks and Services Industry Association (6G IA, Europe) - Aligning India's 6G research with Europe's efforts and supporting global standardization.
- iii) 6G Flagship – Oulu University (Finland) - Collaborating on 6G

technology development and establishing a 6G Test Centre.

- iv) NGMN Alliance (Germany) - Focusing on network disaggregation, sustainability, and next-gen network development.
- v) 6G Forum (South Korea) - Promoting global leadership in 6G and setting international standards for telecom innovation.
- vi) 5G ACIA (Germany) - Facilitating 5G/6G technology development for industrial sectors and fostering collaboration across telecom and automation industries.
- vii) UK Telecom Innovation Network (UK TIN, UK India Future Network Initiatives) - Strengthening India-UK collaboration in future telecom infrastructure and innovation projects.
- viii) 6G Brasil (Brazil) - Promoting collaboration in 5G/6G technologies and sharing best practices for global innovation.

These MoUs enhance India's leadership role in 6G and quantum communications, accelerating the development of transformative telecom solutions and contributing significantly to the global telecom ecosystem.

3.1.3 Multilateral meetings

i) BRICS engagements:

The first meeting of BRICS Working Group for Cooperation in ICTs under the presidency of Russia was held from 24-25 April 2024, through virtual mode. The meeting was hosted by BRICS chair Russia and DOT delegation led by DDG (IR) participated in the meeting along with delegation of other BRICS member states. During the meeting discussions were held on BRICS theme Artificial Intelligence, Digital Infrastructure and Digital Competence and details about the various meetings like Working Group on Cooperation in ICTs, Digital BRICS Task Force (DBTF), BRICS Institute of Future Networks (BIFN), Focus Group of BRICS Platform on Digital Public Infrastructure, Digital BRICS & Business Forum & Exhibition and the 10th BRICS Ministers of Communications to be held under this track.

The 2nd BRICS Working Group meeting for cooperation in ICTs was held on 09-10 July. The Indian side was represented by various stakeholder under the chairship of DDG(IR). During the meeting discussions were held on zero draft of Declaration of the 10th BRICS Communication Ministers Meeting to be held on 27 September 2024.

Concept note on BRICS alliance in the protection of children in the digital environment, Terms of reference (ToR) of Focus Group of BRICS platform on Digital Public Infrastructure, Concept note on BRICS Digital Industry Ecological Cooperation Network and Concept Note of China-BRICS Artificial Intelligence Development and Cooperation Center.



Second meeting of BRICS Working Group held from 23-27 Sept, 2024

Various events like BRICS Working Group on ICT Cooperation, BRICS Institute of Future Networks, Digital BRICS Task Force and Digital BRICS Forum were held from 23-27 Sept, 2024.



10th BRICS Communications Ministers Meeting was held on 27th September 2024. A DoT delegation led by Member(T) participated in BRICS Meetings

Outcome and Way forward of the BRICS 2024 Communications Ministers' Meeting

- a) The BRICS Ministers Declaration 2024 provides a clear roadmap for member countries to navigate the complexities of digital transformation in a cohesive and ethical manner by focusing on emerging technologies, AI, digital infrastructure, and capacity building,
- b) BRICS is not only addressing immediate technological needs but also laying the groundwork for sustainable socio-economic development. The commitment to cooperation and collaborative initiatives highlights the collective resolve of member nations to ensure that the benefits of digital advances are inclusive and equitable.
- c) With ongoing dialogues and frameworks established in this declaration, BRICS is poised to emerge as a leading coalition in shaping the future of the global digital economy.
- d) The outcome and next steps under BRICS ICT Track are as follows:
 - The draft Terms of Reference on Focus Group on Digital Public Goods will be further deliberated and finalized for immediate nomination of experts in order to start the work of the Focus group for concrete outcome of this focus group.
 - The BIFN website is an important aspect in order to share the information among BRICS BIFN chapters. It was decided that BIFN chapter will develop their branch's website that will have linkage with the main website of BRICS presidency.
 - The Draft Terms of Reference for the four Study Groups will be further deliberated and finalized.
 - Examination of new concept like AI Alliance, AI development center, Digital ecosystem cooperation network, Alliance on Child on line protection in digital environment and participation of Industry /Academia/R&D institution in it.
- ii) Commonwealth Telecommunications Organisation (CTO) Council Meeting:

The Indian delegation led by DDG (IR) participated in 62nd Commonwealth Telecommunications Organization (CTO) Council meeting on 24th May, 2024 virtually. Stock of various activities of CTO in previous year was taken. Financial plan of current year and other activities of CTO like HR and legal, membership related issues and telecom/ ICT policy aspects were discussed.

iii) WSIS+20 Forum High Level Event 2024

World Summit on the Information Society (WSIS)+20 Forum High Level Event 2024 was held in Geneva from 27 to 29 May 2024. The Indian delegation led by Additional Secretary (Telecom) presented the Indian position on emerging technologies in the field of telecom/ ICT. Additional Secretary (Telecom) during his key note addressed spoke about the potential of emerging technologies like IoT, Artificial Intelligence (AI), big data, cloud, blockchain, etc. and articulated the use of technology in building a sustainable future. He also highlighted the key reforms undertaken by India in the telecom sector. He reiterated India's commitment towards implementation of future technologies to bridge the digital divide and ensure a sustainable future for humanity.

iv) AI for Good Global Summit 2024:

The AI (Artificial Intelligence) For Good Global Summit 2024 was held in Geneva on 30-31 May 2024. The AI Governance Day was also celebrated on 29 May 2024 with round table and panel discussions; during which the Indian delegation headed by Additional Secretary (Telecom) put forth India's views on Responsible AI and its impacts on the society. The summit showcased state-of-the-art AI solutions and cutting-edge technologies, aligned with United Nations' Sustainable Development Goals (SDGs) and responsible AI. A high-level round table was also held on 30 May 2024 to discuss the AI Standards. India presented its initiatives in the field of Artificial Intelligence such as Sanchar Saathi, Chakshu, Telecom Analytics for Fraud Management and Consumer Protection (TAFMCP) etc. at the Summit.

v) ADGSOM-ATRC Joint Working Group Meeting:

Association of Southeast Asian Nations (ASEAN) Digital Senior Officials' Meeting (ADGSOM)- ASEAN Telecommunications Regulators' Council (ATRC) Joint Working Group Meeting which was held in Bandar Seri Begawan, Brunei Darussalam was joined by Indian delegation led by DDG (IR), DoT virtually on 26 June 2024. The status of various projects in implementation of Digital Workplan 2024 and plan for the future projects was discussed during the meeting.

vi) Intersputnik:

The Joint 52nd Session of the Board and 27th Session of the Operations Committee of the Intersputnik IOSC was held from 24-27 June 2024 in Cuba. The member administrations were required to vote on the agenda items of the Joint 52nd Session of the Board and 27th session of the

Operations Committee of the Intersputnik International Organization of Space Communication (IOSC).

vii) Consultation meeting of ITU Area Office and Innovation Centre:

A consultation meeting of ITU Area Office and Innovation Centre was held 31st July 2024 in New Delhi. A key note address was delivered by Member (T) during the inaugural session. India participated in this meeting along with the other Member States like Bhutan, Nepal, Maldives and Bangladesh covered by this ITU Area Office. Common Alert Protocol (CAP) and Cell Broadcasting (CB) Workshop was also held from August 1-2, 2024. The presentation from India on progress made in the field of ICT and plans for future was presented during the consultation meeting.

viii) Seminar on Progress of Asia Pacific Telecommunity (SPA-2024)

The Seminar on Progress of APT (SPA-2024) took place on 18 November 2024 in Kuala Lumpur, Malaysia. The seminar aimed to review the activities and achievements of the Asia-Pacific Telecommunity (APT) in 2024, along with discussions on regional initiatives. The key focus was on reviewing APT's activities in 2024, highlighting major projects and initiatives undertaken throughout the year. Updates were also provided on the International Telecommunication Union's (ITU) activities in preparation for the World Telecommunication Development Conference (WTDC).



Seminar on Progress in APT for the year 2024 (SPA-2024) at Kuala Lumpur, Malaysia

ix) The 48th Session of the APT Management Committee (MC-48):

The 48th Session of the APT Management Committee (MC-48) was held from 19 to 22 November 2024, in Kuala Lumpur, Malaysia. The meeting's main objectives were to review APT's activities in 2024 and to approve the work program and budget for 2025. Discussions included a comprehensive review of the year's activities, focusing on the progress and outcomes of key initiatives.

The committee also discussed and approved the work program and annual budget for the coming year, ensuring alignment with APT's strategic objectives. Additionally, reports were presented from various key forums and groups, including the APT Policy and Regulatory Forum, the APT Telecommunication/ICT Development Forum, the APT Wireless Group, the APT Standardization Program, the APT Capacity Building Programme, and the South Asian Telecommunication Regulators' Council (SATRC).

Further discussions included updates on ITU's World Telecommunication Conferences and related preparatory groups such as WTDC, WRC, and WTS.

3.1.4 World Telecommunication Standardization Assembly 2024 (WTSA-24)

i) Curtain Raiser on of WTSA-24 and AI for Good Impact India

Additional Secretary (Telecom) inaugurated the curtain raiser on World Telecommunication Standardization Assembly 2024 (WTSA-24) and Artificial Intelligence (AI) for Good Impact India on 31 May 2024 at Geneva along with Director of Telecommunication Standardization Bureau (TSB).

WTSA is the governing conference of the ITU Standardization Sector and is one of the three key world conferences of the International Telecommunication Union (ITU). The 2024 session of the WTSA scheduled to be held from 15 to 24 October 2024 in India was preceded by Global Standards Symposium on 14 Oct 2024 at Pragati Maidan, New Delhi.

AI for Good Impact India, a conference on Artificial Intelligence and Robotics for Youth showcasing its impact on the society was scheduled on the sidelines of WTSA on 17-18 Oct 2024 at the same venue.

ii) World Telecommunication Standardization Assembly (WTSA) 2024 Table Top Exercise:

It was also held from 5-6 August 2024 at Bharat Mandapam, Pragati Maidan, New Delhi. Table Top Exercise is a security exercise wherein officials of International Telecommunication Union (ITU) held meeting with various security stakeholders from India such as Delhi Police, SPG,

Ministry of Home Affairs, Directorate General of Health Services, India Trade Promotion Organization and Ministry of External Affairs etc. The meeting was hosted at Bharat Mandapam from 5-6 August 2024 and was attended by around 40 officials. Discussions on wide range of security issues pertaining to WTSA 2024 (scheduled from 14-24 October 2024 at Bharat Mandapam, New Delhi) including mock drills by various security agencies on different kinds of security scenarios were held.

iii) Organization of WTSA, New Delhi:



Hon'ble Prime Minister of India, Hon'ble Minister of Communications and Development of North Eastern Region and Hon'ble Minister of State for Communications and Rural Development at WTSA-24

The World Telecommunication Standardization Assembly (WTSA) 2024, a key global event in the field of telecommunications, was successfully hosted by India from 15-24 October 2024. The event was preceded by Global Standards Symposium (GSS) 2024 on 14th October 2024, The assembly brought together over 3700 representatives from over 160+ countries, including high-level officials, industry leaders, and technology experts, to address the future of global telecommunications standards.

a) Key proposals by India include:

- A new Resolution on Enhancing the standardization activities on Digital Public Infrastructure
- A new Resolution on Standardization activities of the ITU Telecommunication Standardization Sector on AI technologies in support of telecommunications/ Information & Communication Technology (ICT),

b) Other new ITU-T Resolutions supported by India include:

- Enhancing the standardization activities on sustainable digital transformation
- Promoting and strengthening metaverse standardization
- Promoting and Strengthening Standardization Activities for Vehicular Communications
- Strategic Planning in ITU Telecommunication Standardization Sector;
- Provision of handset-derived caller location information for emergency communications
- Enhancing the engagement of next generation experts in ITU-T standardization activities.



Hon'ble Prime Minister of India with foreign delegates at WTSA-24

These initiatives not only bolster India's role as leader in the areas of telecommunication/ Information & Communication Technology (ICT), but also align seamlessly with the Hon'ble Prime Minister's vision for a robust Digital Public Infrastructure, as articulated during India's G-20 Presidency. These resolutions are also aligned with Hon'ble Prime Minister's four pillars of Digital India - Low-priced devices, extensive reach of digital connectivity to every nook and corner of the country, easily accessible data and goal of 'Digital First'.

Additionally, India has also contributed significantly to the revision of approximately 25 existing resolutions. Notable approvals and consensus reached include Collaboration with International Organisation for Standardization (ISO), Telecom Numbering Management, Cybersecurity, Telecommunication/ICT accessibility for persons with disabilities, and ICT &

Environment/Climate Change. This progress reflects a collaborative spirit, with many resolutions achieving consensus without changes, reinforcing a unified approach to global standards.

India's active participation has not only highlighted its leadership in telecommunications but has also garnered support from numerous countries, including the USA, UK, Brazil, China, Japan, and Australia. India's chairmanship of the event also saw many long discussed structural reforms carried out successfully, like creating a new Study Group based on merger of SG9 and SG16, having not more than one chair from one country and finalization of leadership positions despite lot of divergent views.

WTSA 24 featured eight new resolutions and 44 modified resolutions were taken up. This 10-day event witnessed record-breaking milestones establishing India as a substantial player in the telecommunications industry. Some of the key highlights of the event are:

- **Record Participation:** A historic turnout of 3,700 delegates from over 160 countries, marking the highest participation ever for a WTSA assembly.
- **Leadership Recognition:** Prominent telecom expert and former Advisor at Department of Telecommunications, Government of India was unanimously elected as Chair for WTSA-24.
- **Leadership in Study Groups:** Maximum number of leadership positions secured by India ever in ITU-T. Now all 10 ITU-T Study Groups and SCV (Standards Committee on vocabulary) has Indian experts in leadership role. This is a major jump from 7 such positions in WTSA 22 to 11 positions now
- **Championing Gender Balance:** The event celebrated unprecedented female participation, advancing gender equity in telecommunications with the highest female participation of 26% for the WTSAs held outside Geneva (in Geneva 2022, it was 32%)
- **Maximum side events:** More than 15 high level side event were also organized along with the WTSA like AI4Good: India impact, Network for Women (NoW), Kaleidoscope, Regulators Conference, UN Disaster Risk Reduction Conferencing, ITU-WHO Safe listening, Hackathon, ITU Expo etc.
- **Unprecedented Academic Engagement:** The 15th ITU Kaleidoscope Conference saw record paper submissions, reflecting global interest in the future of digital infrastructure. Two-third of these papers were from India as well as the top three papers awarded the best paper prize.
- **Participation of Youth and Entrepreneurs:** Events like Robotics for Good Youth Challenge India and Innovational Exchange saw participation of

Youth and Entrepreneurs. Students from across 11 states participated in the challenge. Out of 120 teams, 51 teams were selected to present their robotics solutions under the theme of disaster management. As a part of AI for Good Impact India, the winners of the junior and senior categories will go to Geneva in July 2025 to compete internationally. In Innovational Exchange saw thematic discussions by youth and startups on NextGen Networks (5G/6G), AI & robotics, Secured Communication Networks, and Quantum Communications.

- Bharat 6G Alliance: Key MoUs were signed with international stakeholders, a step towards the promise of India's contribution to 10% of global 6G patents.

c) Key Highlights of WTSA 2024:

- Advancing Global Connectivity: The primary focus of this year's assembly was to accelerate global digital transformation, with an emphasis on bridging the digital divide and ensuring equitable access to emerging technologies. Key discussions centered around the role of 5G, 6G, and next-generation networks in driving economic development and innovation across industries and regions.
- Cybersecurity and Data Protection: In the face of increasing cyber threats, the assembly placed significant emphasis on creating international standards for cybersecurity, data privacy, and the protection of critical digital infrastructure. The ITU's commitment to strengthening global cooperation on these fronts was reaffirmed, with several member countries endorsing new initiatives aimed at enhancing cyber resilience globally.
- Sustainability in Telecommunications: The importance of sustainability in telecommunications was underscored, with sessions addressing energy-efficient network technologies, reducing e-waste, and promoting green practices within the ICT sector. India's efforts toward a greener digital ecosystem, including its advancements in renewable energy integration for telecom infrastructure, were highlighted as an example for other nations to follow.
- Standards for Emerging Technologies: With rapid technological advancements, the assembly provided a platform to discuss the development of standards for emerging fields such as Artificial Intelligence (AI), the Internet of Things (IoT), blockchain, and quantum computing. These discussions are vital to ensuring interoperability, security, and ethical frameworks in future technologies.
- Inclusive and Accessible Technology: Ensuring that digital technologies are accessible to all, especially marginalized communities, was a central

theme. The assembly called for new global standards that promote digital inclusion, focusing on accessibility for people with disabilities, and ensuring affordable broadband connectivity in underserved regions.

- **Indian Leadership in Telecommunications:** India's role as a global leader in telecom was reinforced throughout the event. The country's ongoing commitment to expanding its digital infrastructure, including rural broadband connectivity and the push toward 5G rollout, was widely recognized. India also emerged as a key player in driving policy discussions, having hosted several side events, workshops, and technical sessions during the week.
- **Collaboration with Industry Stakeholders:** The WTSA 2024 also saw an enhanced collaboration between the public and private sectors. Major telecom companies, regulators, academics, and non-governmental organizations (NGOs) participated in discussions on creating harmonized global standards and policies that support the growth of the global digital economy.
- **Future of Global Standards:** As the assembly wrapped up, delegates approved several key resolutions to advance the ITU's mandate in standardization efforts. The outcomes of these resolutions are expected to play a crucial role in shaping the future of global telecommunication policies, with an emphasis on ensuring security, equity, and sustainability in global ICT infrastructure.

d) **Department of Telecommunication (DoT) Pavilion:**

The Department of Telecommunications (DoT) showcased a few citizen-centric initiatives and demonstrations. The exhibits emphasized how technology and innovation can be leveraged to benefit citizens, making public services more efficient, accessible, and user-friendly.

- **Quantum Compute and Quantum Communications:** Quantum Communication Phone on C-DoT based Technology was shown live.
- **Quantum Computer (replica)** was displayed in India for the first time in India by Department of Telecommunications with the support of IBM.
- **Telecom Testing:** Telecom Engineering Center displayed the process and testing methods for Mandatory Testing of Telecom Equipment.
- **Sanchar Saathi portal and Citizen Centric Services:** presented how DOT helps citizens through Chakshu portal (Reporting of Suspected Frauds), Block your lost / stolen mobile phone Central Equipment Identity Register (CEIR), Know your mobile connections (TAF COP) and Know your Mobile/IMEI verification.
- **EMF radiation Measurement:** Wireless and Monitoring Organization

(WMO) showcased the EMF radiation measurement.

- CGCA- Displayed the SAMPANN initiatives to help the pensioners & SARAS- Revenue Management System.
- USOF- Bharat Digital Nidhi, Hologram Fan and VR Sets and videos of Digital Bharat Nidhi & eUSOF.

The Department of Telecommunications (DoT) made presentations on various innovative topics at the Digital Wave Stage during the WTSA-24 event. Their presentations included:

- Non-Intrusive Market Surveillance in Telecom networks to handle rouge and un-certified products/equipment, which are added to the network as per the requirements of conformity assessment framework.
- Test-as-a-Service (TaaS) is innovative platform to for demonstration of remote testing.
- Anytime Smart Help Anywhere (ASHA) by TEC, DoT: aims to develop the Proof-of-Concept towards an IoT-based safeguard device,
- Securing a Quantum future in India – Information security
- AI for edge & cloud

Quantum computing for 6G communication: Quantum computing is poised to play a transformative role in the development of 6G telecommunications by addressing some of the critical challenges of data processing, security, and system efficiency.



Hon'ble Minister of State for Communications at DoT Pavilion, WTSA24

Within the WTSA-24 Expo, the Digital Wave Stage was served as a vibrant platform bringing together governments, industry leaders, international bodies, and academic institutions to underscore the crucial contributions of the International Telecommunications Union (ITU) in advancing cutting-edge technologies.

The stage was indeed a focal point of the event, hosting a series of dynamic presentations, insightful panel discussions, and engaging demonstrations.

e) Indian Exhibitors: A Glimpse into the Future

Throughout the event, 32 Indian exhibitors including academic institutions displayed their products and innovations, making it a vibrant showcase of cutting-edge technology and creative solutions. The list of the Indian exhibitors is as below;

EASIOFY SOLUTIONS	Telecommunications Standards Development Society, India (TSDSI)	IOS-MCN	ARECA WAVELET Communications Private Limited	Ernst & Young
Susan Future Technologies	Chipsprit Technologies Pvt Ltd.	YuDash Systems Pvt. Ltd.	Syook	Eoxys Systems India Pvt Ltd
TechPhosis Private Ltd	Core Data	dezynForge ,	NSUT	Lepton Software
Benlycos,	VNIT	Viasat India,	ReadyPod Technologies Pvt	Rentology Global Solution Pvt. Ltd.
Creonimus Technology Solutions LLP	Gadgeon Smart Systems	Gx India Private Limited	IOTAS Solutions Pvt Ltd	INVAS Technologies (P) Ltd
SMPS Electric Control Pvt. Ltd.	CLUPAV SCIENTIFIC PVT LTD	Appfoster	NAM InfoCom Pvt Ltd	Sensorise
Empfly	IIIT			

32 Indian exhibitors showcased a diverse range of products and innovations:

- AI and IoT Solutions
- 5G Technology and Applications
- Telecom Equipment and Solutions
- Emerging Technologies like Pseudo Satellites

- AI-Powered Health Solutions
- Data Center Solutions
- AI-Driven Software Solutions

These exhibits drew significant attention and interest from attendees.

3.2 India Mobile Congress 2024

India Mobile Congress (IMC-2024) was organized by the Department of Telecommunications (DoT) in association with Cellular Operators Association of India (COAI). The eighth edition of IMC-2024 was held from 15th to 18th October, 2024 at Bharat Mandapam, New Delhi, along with the World Telecommunication Standardization Assembly 2024 (WTSA-24).

IMC 2024 focused on upcoming technologies like Quantum Communications and 6G under the theme "The Future is Now."



Inauguration of India Mobile Congress (IMC) 2024 by the Hon'ble Prime Minister of India at Bharat Mandapam, New Delhi

Hon'ble Prime Minister inaugurated IMC 2024 in presence of Hon'ble Minister of Communications and Development of North Eastern Region, Minister of State of Communications and Rural Development and Secretary Telecommunications on 15th October 2024.

IMC 2024 showcased cutting-edge technological innovations in the field of Telecommunications and its use cases in agriculture, health, education, defense etc. Communication technologies are expected to significantly contribute to

India's GDP through advancements in 5G, 6G, and other emerging technologies. During the inaugural, the Hon'ble Prime Minister reiterated India's commitment to spearheading digital transformation and setting a global standard in technological prowess.

IMC 2024 provided a platform for showcasing advance communications technologies, use cases, local manufacturing and start-ups. This year, during the IMC 2024, more than fifty conferences and seminars were held on varying topics such as Green Telecom, Data Security, Data Privacy, Building Telecommunication Infrastructure, Satellite Communications, International 6G Symposium, Global Regulators Conference, Broadcasting etc. IMC2024 saw august presence of senior government representatives including key figures like Hon'ble Minister of Commerce and Industry, Hon'ble Minister of State for Information and Broadcasting of India, and Chief Ministers and IT ministers from various states.



Hon'ble Prime Minister, Minister of Communications, Minister of State of Communications, Secretary Telecom, with Industry Leaders and DoT officials

The event also drew leading industry stakeholders such as Chairman of RJIL, Chairman of Bharati Enterprises and Chairman of the Aditya Birla Group, Vodafone Idea, Chairman and Managing Director Bharat Sanchar Nigam Limited, CEO Center for Development of Telematics (CDOT) and many other industry leaders, startup founders, academicians, foreign dignitaries, media and students.

IMC 2024 was a groundbreaking event, attracting over 1.75 lakh attendees an increase of 17% from IMC 2023 (1.5 lakh in IMC 2023) and hosted delegates from a 123 countries. The event featured 920 startups, 100 investors, over 820 speakers, and 264 partners & exhibitors, demonstrating India's role as a

catalyst in global technology innovation. The comprehensive portfolio of exhibitors included leading telecom operators and infrastructure providers such as Airtel, JIO, VI, BSNL, Ericsson, TCS, Tanla, C-DOT, STL, HFCL, Nokia, Intel, Red Hat, and Qualcomm among others. In addition, the event highlighted 1475 distinctive technology use cases across various industries.

Furthermore, the forum featured 13 Ministries & States and Public Sector Units, including the Ministry of Mines, Ministry of Heavy Industries, Ministry of Coal, Ministry of Railways, Department of Science & Technology (DST), MeitY, Assam Electronics Development Corporation Ltd. (AMTRON) among others showcasing the application of technology across various business innovations. These Ministries and Departments demonstrated digital transformation and the potential of emerging technologies to enhance the nation's socio-economic position. IMC 2024 also witnessed the participation from 32 Academic institutions, premier educational institutes.

The event brought together over 820 speakers across 186 conference sessions, including 54 keynotes, 10 roundtables, and 122 panel discussions. IMC 2024 brought together a stellar lineup of industry leaders from across the globe who are driving innovation and shaping the future of technology.

The extensive program delivered in-depth analysis and discussions on cutting-edge topics such as 5G, 6G, Artificial Intelligence, Semiconductors, Electronics Manufacturing, Enterprise Transformation, Security, SATCOM, Deep-Tech, Clean-Tech, Smart Mobility, Industry 4.0, and Quantum Technologies. With an aim to explore potential advancements and transformative impacts of 6G, IMC also hosted an International 6G Symposium that facilitated meaningful dialogues and laid the groundwork for 6G innovations that will redefine the tech landscape. Aligned with the Prime Minister's vision, IMC 2024 aims to establish India as a frontrunner in global tech innovation, positioning the nation within the top echelons of the global economy. Moreover, the expo underlined India's commitment to integrating sophisticated technologies and emphasized its role in shaping global tech trends.

3.3 Investment Promotion

i) National and International Events:

a) CommunicAsia 2024:

The Telecom Equipment & Services Export Promotion Council (TEPC) organized the India Pavilion at CommunicAsia 2024, held from May 29-31, 2024. This flagship event, conducted under the Market Access Initiative (MAI) scheme of the Department of Commerce, provided a dynamic platform for Indian ICT companies to exhibit their innovations on a global stage.

The pavilion featured 18 leading Indian companies, each showcasing state-of-the-art products and solutions tailored to meet the diverse needs of the global ICT market. Through their participation, these companies engaged with an international audience, fostering connections with potential buyers and partners. The event facilitated numerous B2B meetings and business negotiations, paving the way for strategic collaborations and expansion into new markets.

CommunicAsia 2024 proved instrumental in highlighting India's growing prominence in the global ICT ecosystem. By enabling direct interactions with stakeholders from across the world, the event reinforced India's position as a hub for innovation and technology in the telecom sector.



India Pavilion at CommunicAsia 2024, held from May 29-31, 2024

b) Defence Sector ICT Conclave- CIS & ASEAN Countries:

TEPC successfully hosted the Defence Sector ICT Conclave, aimed at fostering collaboration with CIS and ASEAN countries. This high-impact event brought together an esteemed audience, including Ambassadors, High Commissioners, Defence Attachés, and senior diplomats from over nine countries, underscoring its significance in advancing international partnerships in the defence and ICT sectors.

The conclave featured 21 premier Indian companies, showcasing an impressive array of cutting-edge technologies and solutions designed to meet the evolving needs of the defence ICT domain. These included advanced communication systems, secure networking solutions, and innovative cyber defence technologies, demonstrating India's growing leadership in the global defence technology ecosystem.

The event served as a strategic platform for dialogue and collaboration, facilitating discussions on critical issues such as enhancing defence communications infrastructure, adopting advanced ICT solutions, and exploring opportunities for joint ventures and technology transfers. Through direct engagement with key stakeholders, the conclave fostered meaningful

connections and business opportunities, contributing to the global competitiveness of India's defence and telecom industries.



Defence Sector ICT Conclave- CIS & ASEAN Countries

c) GITEX Global 2024:

The Telecom Equipment and Services Export Promotion Council (TEPC) organized the Bharat Pavilion at GITEX Global 2024, held from October 14–18, 2024, at the Dubai World Trade Centre. Supported by India's Department of Telecommunications, the event showcased the latest advancements in the telecom sector. A total of 18 Indian companies participated, presenting state-of-the-art telecom products and software under the Bharat Pavilion banner.

GITEX Global 2024 featured participation from over 400 global tech entities, with a strong focus on AI, digital innovation, and data centers. The event hosted several co-located initiatives, including the Future Blockchain Summit and Fintech Surge, which spotlighted emerging tech sectors. This participation highlights India's growing influence in global tech and telecommunications, emphasizing its commitment to fostering international collaboration and innovation.



Bharat Pavilion at GITEX Global 2024

d) Atma-Nirbhar Bharat Pavilion:

TEPC organized 'Atma-Nirbhar Bharat Pavilion' in India Mobile Congress (IMC) 2024 held from October 15-18, 2024 at Bharat Mandapam, New Delhi. 64 Companies and 200 Startups participated in the Atma-Nirbhar Bharat Pavilion by exhibiting their products and technology. 65 foreign delegates from 22 countries visited the pavilion and interacted with domestic telecom equipment suppliers.



Atma-Nirbhar Bharat Pavilion

e) AfricaCom 2024:

The Telecom Equipment and Services Export Promotion Council (TEPC) participated in AfricaCom 2024, held from November 12 to 14 at the Cape Town International Convention Centre in South Africa. This event was part of the Africa Tech Festival, which is one of the largest technology and telecom gatherings in Africa, bringing together over 15,000 attendees, 300+ exhibitors, and key policymakers. TEPC set up the India Pavilion, supported by the Department of Telecommunications, Government of India, showcasing telecom innovations from 18 Indian companies.



AfricaCom 2024

AfricaCom serves as a vital platform for promoting technology-driven solutions in the African region. The TEPC delegation highlighted India's advancements in telecom hardware, software, and services, fostering collaboration opportunities with African counterparts and contributing to the goal of enhancing digital connectivity across the continent.

CHAPTER 4

OFFICES & FIELD ORGANIZATIONS

CHAPTER 4

OFFICES & FIELD ORGANIZATIONS

4.1 Wireless Planning and Coordination (WPC)

4.1.1 Introduction:

The Wireless Planning & Coordination (WPC) Wing of the Ministry of Communications is India's national agency responsible for managing and regulating radio frequency (RF) spectrum and satellite orbits, including both geostationary (GSO) and non-geostationary (non-GSO) orbits. These resources are crucial for communication, broadcasting, and satellite services.

The main responsibilities of the WPC Wing are:

- i) **Planning and Engineering:** The WPC plans the allocation and efficient use of radio spectrum, ensuring minimal interference and optimal usage.
- ii) **Regulation:** The WPC enforces compliance with standards and guidelines for wireless and satellite communications, including issuing licenses for RF spectrum usage.
- iii) **Frequency Allotment and Assignment:** The WPC allocates specific frequency bands to authorized users, preventing conflicts between different services.
- iv) **Authorization and Renewals:** The WPC grants spectrum usage licenses and manages the renewal process.
- v) **Interference Monitoring:** The Wireless Monitoring Organization (WMO), a field unit of the WPC, monitors and inspects radio frequencies to ensure interference-free operations for authorized users.

The WPC Wing serves both government and private sectors, covering a wide range of users, including security (e.g., defense, law enforcement) and civil (e.g., telecom, broadcasting) services. It plays a vital role in maintaining an organized and efficient spectrum management system in India. As technology evolves and the demand for spectrum grows, the WPC Wing continuously adapts to meet new challenges and ensure seamless communication across the country. The WPC Wing (Wireless Planning & Coordination Wing) and WMO (Wireless Monitoring Organization) represent the Government of India in key international forums, including the International Telecommunication Union - Radiocommunication (ITU-R) under the United Nations and the Asia Pacific Tele community (APT), the ITU's regional counterpart.

WPC Wing has nine verticals to look after the above work. It also has five RLOs (Regional Licensing Offices) located at New Delhi, Mumbai, Kolkata, Chennai & Guwahati to deal with the issue & renewal of VHF licenses in the frequency band 136 – 174 MHz, non-network licenses, certificates of proficiency, type approvals and conduct of certificate of proficiency examinations. The details of the above is mentioned as under.

4.1.2 Work profile and the achievements of nine verticals of WPC Wing:

- i) International Spectrum Regulation (ISR) Group of WPC Wing is responsible for the international aspects of Radio Spectrum Management, ensures active participation of experts from India, ensures India's active participation in ITU and APT meetings, contributes to discussions, and monitors spectrum and radiocommunication studies. This helps safeguard India's interests in global communications. ISR Group also deals with the associated tasks of NFAP and NPC.

- a) National Frequency Allocation Plan

The National Frequency Allocation Plan (NFAP) is an essential document that outlines the allocation of radio spectrum for various radiocommunication services in India, ensuring its efficient and interference-free use. The current NFAP was published in 2022.

NFAP is revised periodically based on updates to the ITU Radio Regulations, advancements in radio technology, the evolving communication needs of the country, and the interests of stakeholders. The NFAP-2022 Review/Revision Committee, chaired by the Wireless Adviser of the WPC Wing, has set up working groups to engage with stakeholders—including Government Ministries, wireless users, equipment manufacturers, service providers, academia, and startups—to gather input for the revision of NFAP-2022.

- b) National Preparatory Committee for WRC-27 preparations (NPC)

The National Preparatory Committee (NPC) for WRC-27 will be chaired by the Wireless Adviser, WPC Wing. The NPC, along with its five Working Groups, will conduct consultations with relevant stakeholders, including Ministries, Departments, wireless users, service providers, academia, and startups. The aim of these consultations is to harmonize views and build national consensus to develop India's positions on WRC-27 Agenda Items.

The NPC is tasked with identifying and studying spectrum and regulatory issues related to each WRC-27 Agenda Item. This process will take into account the results of studies conducted by relevant ITU-R Study Groups and associated Working Parties.

Additionally, the NPC will review Asia-Pacific Telecommunity (APT) Proposals and Views on WRC-27 Agenda Items, as well as the agenda for future WRCs. Based on these reviews, the NPC will recommend contributions to key events and processes, including APG-27, CPM-27, RA-27, and WRC-27.

- c) Immersion programme of WPC wing/ WMO officers with various Government/ Private Stakeholders

An innovative and unique capacity-building initiative, the "Immersion Programme", has been conceptualized with the primary goal of enhancing the capability of officials of the WPC Wing/WMO in the field of radio spectrum management and monitoring. This programme provides opportunities to gain insights into various aspects related to wireless systems, their operations, emerging technologies, and challenges faced by different spectrum users and organizations.

Under this initiative, a total of 105 officers from the WPC Wing/WMO have completed immersion programmes conducted at:

- Space Application Centre, Ahmedabad
- National Centre for Radio Astrophysics, Pune
- Reliance Jio Infocomm Ltd., New Delhi
- ISRO Master Control Facility, Hassan
- ISTRAC, Bangalore
- Vodafone Idea Limited
- Delhi Metro Rail Corporation (DMRC)
- Airport Authority of India (AAI)
- Tata Play Ltd.
- Hinduja Global Solutions Ltd.
- IIT Madras Research Park, Chennai
- National Remote Sensing Centre (NRSC)
- Nokia R&D Center, Bangalore
- Tata Communications Ltd.

- d) Participation of Indian delegations in important international events (ITU-R/ APT)

DoT delegates have actively participated in ITU and APT meetings/events, which have been held in a hybrid format, both in-person and virtually. Event-wise participation in ITU/APT meetings is summarized in Table 5.1 and Table 5.2 below:

Table 5.1

Sr. No.	DoT delegations deputed for International E-meetings w.r.t. Radiocommunication during 2024-25 (01-4-2024 to 02-12-2024)		Number of Meetings attended
1.	ITU Meetings	Spectrum Management	6
2.		Radiowave Propagation	5
3.		Satellite Services	9
4.		Terrestrial Services	6
5.		Broadcasting Services	4
6.		Science Services	4
7.		Other ITU-R meetings	2
8.	APT Meetings	Asia Pacific Telecommunity (APT)	2
9.	Other Meeting	Space Frequency Coordination Group (SFCG-43)	1
		Total	39

Table 5.2

S.No.	Statistics on International ITU\ APT meetings held during 2023-24 (01-04-2024 to 02-12-2024)	Number
1.	DoT delegates deputed: Physical participation	30
2.	DoT delegates deputed: Remote participation	152
3.	Non-DoT (Govt.) delegates included in DoT delegation (Remote and Physical participation)	53
4.	Non-DoT(Pvt.) delegates included in (Remote and Physical participation)	29
5.	Contribution documents submitted to ITU & APT meetings	39

ii) The National Regulation (NR) Group of WPC Wing plays a crucial role in shaping the regulatory and spectrum management landscape of India's telecommunications sector. It is responsible for developing and implementing policies and frameworks that ensure regulatory compliance and facilitate innovation. Key highlights of the NR Group's activities are as follows:

- a) NR Group is entrusted with the preparation of rules under the Telecommunication Act, 2023, modernizing the regulatory framework to keep pace with industry advancements.
- b) The NR Group actively provided stakeholders and the public with relevant regulatory information related to spectrum management, fostering transparency and promoting informed decision-making.
- c) Work related to the delicensing of spectrum for secondary usage, enabling low-power/very-low-power application-specific devices to operate without individual licensing. This initiative encourages innovation and efficient spectrum utilization.
- d) Provides inputs for cases referred by the Directorate General of Foreign Trade (DGFT), enabling the issuance of import licenses for telecom equipment.

Important Work Performed During the Year:

- a) Introduction of Guidelines for Experimental and Demonstration Licenses for facilitating ease of doing business:
 - New guidelines were introduced to encourage innovation, allowing businesses, startups, and researchers to test technologies in real-world settings within a controlled framework.
 - A streamlined approval process was established: licenses are auto-approved after 30 days, and provisional licenses are granted after 60 days if inter-ministerial feedback is pending. This initiative boosts ease of doing business while refining technologies for large-scale deployment.
- b) Self-Declaration Based Equipment Type Approval for facilitating ease of doing business
 - Equipment Type Approval for wireless devices operating in delicensed frequency bands is now granted based on self-declaration, reducing administrative hurdles and expediting the deployment of such devices.
- c) Rules Published under Telecommunication Act, 2023:
 - Telecommunications (Amateur Services) Rules, 2024 (Section 47)
 - Telecommunications (Commercial Radio Operator Certificate of Proficiency to Operate Global Maritime Distress and Safety System) Rules, 2024 (Section 46)
- iii) International Mobile Telecommunications (IMT) Group deals with frequency assignments and managements related to the IMT bands.

Recent achievements are as follows:

a) Spectrum Auction for 2023-24

Based on the approval of the Union Cabinet and the subsequent issue of the Notice Inviting Applications (NIA) on 08-03-2024, Spectrum auction were carried out by the Department of Telecommunications over a period of two days from 25-06-2024 to 26-06-2024.

During the auction, a total of 10522.35 MHz of access spectrum, pan India across the 22 LSAs, was made available for bidding in various frequency hands with a total value of Rs. 96,238.45 crores at reserve price. Three bidders namely M/s Bharti Airtel Limited, M/s Reliance Jio Infocomm Ltd and M/s Vodafone Idea Ltd participated in the auction process.

The bidding took place for the spectrum in the 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2500 MHz, 3300 MHz and 26 GHz bands. During the auction a total of 141.4 MHz of spectrum in the 900 MHz, 1800 MHz, 2100 MHz and 2500 MHz bands were sold at a market determined price of Rs. 11340.78 crores.

Subsequently, Frequency assignment letters were issued on 01-08-2024 post harmonization exercise.

b) Assignment of spectrum to BSNL

RF Spectrum in the 700 MHz and 2100 MHz band were assigned to BSNL on 03-05-2024 as per the approval of the Union Cabinet. The details are as given below:

5 MHz of paired spectrum in 2100 MHz band in Andhra Pradesh, Gujarat, Madhya Pradesh and Odisha LSAs.

10 MHz paired spectrum in 700 MHz band in Gujarat, Haryana, Himachal Pradesh, Odisha, Uttar Pradesh (East) and Uttar Pradesh (West) LSAs.

c) Issuance of renewals of Public Mobile Radio Trunking Services (PMRTS) networks:

To facilitate the Public Mobile Radio Trunking (PMRT) services in the various cities in the country, the 32 frequency assignments have been renewed upto 31-12-2024.

d) Re-farming of Spectrum for IMT:

To improve the mobile telecommunication services in the country as well as to facilitate the efficient use of spectrum, a proposal for re-farming of about 700 MHz of spectrum has been put up for the approval of the Union Cabinet.

- iv) IT & SACFA Group of WPC Wing deals with the IT related work and SACFA (Standing Advisory Committee on Radio Frequency Allocations) Siting Clearance related work.

The Standing Advisory Committee on Radio Frequency Allocations (SACFA) in India, under the Ministry of Communications, provides recommendations for the usage of radio frequencies by Fixed stations at a given location. One of SACFA's essential functions is granting siting clearances for wireless installations, including towers, antennas, and other radiating equipment.

a) SACFA Siting Clearance Process

The SACFA clearance ensures that proposed wireless installations comply with guidelines related to:

- Frequency Assignment: Avoiding interference with existing systems.
- Aviation Safety: Ensuring no hazard to aircraft operations in collaboration with the Directorate General of Civil Aviation (DGCA).

b) SACFA Clearance Process:

There has been a significant enhancement in the SACFA Clearance Process, resulting in a streamlined approach for the proliferation of 5G towers. The Department has successfully implemented a self-declaration basis for SACFA Clearances. Accordingly, for sites meeting specific pre-defined criteria, the SACFA Certificate is now generated instantaneously. Approximately 85 percent of cases receive instant clearance.

Furthermore, for the remaining cases undergoing scrutiny by Joint Communications Electronic Staff (JCES) and Airport Authority of India (AAI), an expedited process has been implemented. If no remarks are received within 30 days, the sites are deemed cleared. As a result of these improvements, the average processing time for SACFA Clearance has significantly reduced to just 5 days. Approximately 50,000 SACFA Clearances are now issued every month.

In a move to further support the deployment of 5G small cells on street furniture such as bus shelters, traffic lights etc., the clearance for small cells is now on a registration basis. This streamlined process is resulting in faster deployment of telecom infrastructure and paving the way for enhanced connectivity. The statistical achievements are shown below: -

Sl. No.	Item	Achievements		
		Actual		Anticipated
		2023-2024	01.04.2024 to 09.12.2024	13.12.2024 to 31.03.2025
1	No of SACFA applications processed & Acceptance No. issued.	568157	421426	101240

v) Satellite Group of WPC Wing is involved in issue of the frequency assignments for satellite based communication and broadcast networks for setting up Earth Stations for operation on various Indian Satellites such as GSAT-11, GSAT-12, GSAT-14, GSAT-16, GSAT-18, GSAT-24, GSAT-30, GSAT-31 etc and foreign satellites of INTELSAT, INMARSAT, SES, ASIASESAT, KOREASAT etc.

a) Frequency assignments for Communication based applications:

Frequency assignments have been issued for various Communication based applications such as Commercial Closed User Group(CUG) Very Small Aperture Terminal (VSAT), Captive VSAT, National Long Distance (NLD), International Long Distance (ILD), In flight and Maritime Connectivity (IFMC), Global Satellite Phone Service (GSPS) etc. A few of its related applications are mentioned below:

- River monitoring, canal monitoring, water management.
- Remote Village Wi-Fi connectivity / Last Mile connectivity.
- Connectivity of State load dispatch center for Solar, Wind power project, Hydro Individual power producers.
- Connectivity for Disaster Management Projects, Seismic, Tsunami Warning, Avalanche Monitoring projects.
- Connecting offshore Platforms/ Rigs.
- Providing internet on Aircraft and Vessels/ ships.
- Cellular Backhauling.
- Secure and Independent private network.

b) Frequency assignments for Data Collection Platform:

Frequency assignments have been issued for various Data Collection Platforms which acquire real time meteorological data, such as Flood level, Snowfall level etc. with the help of remote terminals installed over a certain geographical area. This data can be utilized for the following applications:

- Flood forecasting using data acquired by Flood level sensor.
- Study of rainfall over certain geographical area using rain level sensors.
- Snowfall monitoring over certain geographical area for research/strategical purposes.
- Study of other meteorological phenomenon.

c) Frequency services for Broadcasting:

Frequency assignments have been issued for various Broadcasting type of licenses i.e. Teleport, Direct-To-Home (DTH), Headend in the Sky (HITS) and Digital Satellite News Gathering (DSNG). In addition to it, the permissions for operation of uplinking of TV Channels have been generated to Teleport Operators on self-declaration basis.

The details of the frequency assignments/authorizations issued by satellite Section, WPC Wing (upto 27/11/2024) are as under-

S. No.	Type of License	No of License Schedule Renewed	No of Wireless Schedule issued under Wireless Operating License	No of frequency assignments	New Bandwidth assigned (in MHZ)
1	Teleport	85	25	14	80
2	DSNG	138	63	6	6
3	HITS	1	0	1	0
4	DTH	27	15	3	216
5	Commercial VSAT	9	6	13	397
6	IFMC	8	2	2	162
7	Captive VSAT	96	36	9	295
8	ILD	0	0	0	0
9	NLD	3	3	2	0
10	Telemetry, Tracking and Command (TTC)	178	226	4	0.01
11	Mobile Satellite Service (MSS)	5	0	0	0
12	Temporary Permissions	-	-	52	-
13	Demonstration/ Experimental Frequency Clearance	-	-	45	-

d) Structural and procedural reforms:

- The level of disposal for all forms of assignment in respect of Satellite Section has been reduced, which has resulted in fast clearance and disposal of matters.
- The following reforms have been executed in respect of frequency assignments of Satellite Section, WPC Wing: -
 - o Royalty Charges applicable for Captive VSAT Networks were revised vide this Ministry's OM dated 13/09/2021, vide which 25% additional Royalty Charges earlier being paid for the remote VSAT terminals was removed. The Royalty Charges were again revised in Dec'2023.
 - o Single Scrutiny Flow has been implemented through Saral Sanchar portal for all type of Satellite-Group Licenses. The applicants are required to provide the complete information initially itself at time of application submission. The scrutiny of application is done only once by WPC Wing and thereafter-subsequent processes like issue of Letter of Intent, Decision Letter, Import Permission, SACFA Clearance, Wireless Operating License (wherever applicable) are system-generated and can be easily downloaded at applicant's end on module itself. This has resulted in reduction in processing time and has promoted electronic correspondences.
 - o The requirement to obtain Wireless Operating License for the VSAT's operating under Commercial CUG VSAT License has been removed w.e.f Nov'2022. SACFA clearance however will continue to be applicable on the VSAT's. Thus VSAT CUG Operators are no longer required to submit periodic deployment data to WPC Wing.
 - o The requirement to restrict the no of TV Channels, due to minimum prescribed data rate/bandwidth to be used per TV Channel in the transponder bandwidth assigned to a teleport operator is done away w.e.f Nov'2022, which has resulted in better utilization of spectrum. In addition to it, TV Channel Endorsement/De-Endorsement certificates are now generated on self-declaration basis.
 - o Endorsement of vessels and aircrafts under IFMC authorization has also been made online and can be obtained through Saral Sanchar portal on self-declaration basis w.e.f Sept'2023.
 - o NGSO based communication services may get deployed shortly for the first time in India by Licensees using authorized NGSO constellations. With a view to enable such Licensees to demonstrate,

compliance to security and technical conditions, guidelines for provisional spectrum assignment for a period of 6 months was issued in Oct'2024.

- e) Satellite Coordination function is also performed by Satellite Group. International coordination of satellite systems is required to be undertaken as per the provisions of the Radio Regulations (RR) of the International Telecommunications Union (ITU). Coordination of frequency assignments for the individual satellite networks is necessary with satellite networks of other administrations for mutual coexistence and interference free operations of these networks.

- Satellite Coordination with other Administrations:

Administration of Germany has been requested for coordination proposal in respect to KACIFIC-72E satellite network of Germany Administration.

- Satellite filings submitted to ITU for publication in BR IFIC (Total: 27 Nos):

New Filings	API: MICROSAT-2C, FIREFLY, BGS ARPIT SAT, NST SWETCHASAT V0, LEAP-1, RISAT-1B, IITMSAT, RESOURCESAT-3AS, VARUNA_TD, SPADEX, CR/C: INSAT-EHFL24-111.5E, INSAT-EHFL24-48E, INSAT-EHFL24-55E, INSAT-EHFL24 - 68E, INSAT-EHFL24- 74E, INSAT-EHFL24-77.1E, INSAT-EHFL24-83E, INSAT-EHFL24-93.5E, INSAT-NAV-NGSO4, INSAT-NAV-MEO, INSAT-COM(71E) NOTIFICATION: INSAT-KU17(55E), INSAT-NAVR-GS, INSAT-NAV-GSO3 (129.5E), ADITYA, LMI3 RES-49: INSAT-KU17(55E)
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- Coordination with ITU:

Details of Special Sections published in BR International Frequency Information Circular (IFIC) is provided as Annexure-A.

- o Notification & Due-Diligence for Indian Satellite networks (Total: 13 Nos.):

(i) Special Section Part I-S published : 05 Nos

- (ii) Special Section Part II-S published : 03 Nos
 - (iii) Special Section Part III-S published : 03 Nos
 - (iv) Due-Diligence published : 02 Nos.
- o Coordination request Filings for Indian Satellite networks (Total: 10 Nos.):
 - (i) Special Section CR/C published : 5 Nos
 - (ii) Special Section CR/D published : 4 Nos
 - (iii) Special Section CR/E published : 01 Nos
- o Advance Publication of Information for Indian Satellite networks (Total: 16 Nos.):
 - (i) Special Section API/A published : 13 Nos
 - (ii) Special Section API/B published : 03 Nos
 - (iii) Special Section API/C published : 00 Nos
- o BSS Plan as per Appendix-AP30/30A & FSS Plan as per Appendix 30B (Total: 8 Nos.):
- o FSS plan band (AP30B) A6B and Notification filings in respect of INSAT-KUP-FSS(63E), INSAT-KUP-FSS-Y24(111.5E), INSAT-KUP-FSS-Y24(95.5E), INSAT-KUP-FSS-Y24(77.1E), INSAT-KUP-FSS-Y24(48 E) satellite network submitted to ITU.
- Protection of Indian space and Radio Astronomy Service from the satellite networks of other countries. (Total Objections: 227)

Special Section Published in BRIFIC	Administrations whose satellite networks were objected in view of existing and planned Indian satellite networks.
API/A (88 Objections)	Argentina, Australia, China, Croatia, Germany, Italy, Japan, Luxembourg, Norway, Russian Federation, Solomon Islands, Spain, Slovakia, Turkiye, UAE, UK and USA
CR/C (123 Objections)	Argentina, Australia, Azerbaijan, Belgium, Brazil, Bulgaria, Canada, China, Cyprus, France, Germany, Indonesia, Japan, Kazakhstan, Luxembourg, Malaysia, Monaco, Netherlands (Kingdom of the), Oman, Papua New Guinea, Qatar, Rwanda, Solomon Islands, Spain, Saudi Arabia, Thailand, Turkiye, UAE, UK and USA
Part I-S (03 Objections)	Azerbaijan, Russia and USA,
Part II-S (01 Objection)	USA
AP30B (02 Objections)	Germany and Malaysia
AP30/30A (02 Objections)	Australia and Qatar
AP30E (08 Objections)	China, Germany, Japan, Qatar and Turkiye

o Notification & Due Diligence for Indian Satellite networks:

	Notification			Due Diligence
Month	Part I-S	Part III-S	Part II-S	RES 49
Apr-24		INSAT-NAVR-GS		
May-23			INSAT-KU11(74)E	
Jun-24			INS-2	
Jul-24	INSAT-KUP-FSS(63E)		INSAT-KUP-FSS(63E)	INSAT-KUP-FSS(63E)
Aug-24	INSAT-KU17(55E), INSAT-NAV-GSO3(129.5E), INSAT-NAVR-GS			INSAT-KU17(55E)
Sept-24				
Oct-24	ADITYA	INSAT-KU17(55E)		
Nov-24		INSAT-NAV-GSO3(129.5E)		

o Coordination request Filings for Indian Satellite networks:

Month	CR/C	CR/D	CR/E
Apr-24	ORBITCONNECT 95E		
May-23		INSAT-NAV-GSO4(129.5E), INSAT-NAV-GSO4(83E), INSAT-NAV-	
Jun-24	INSAT-NAV-GSO4(129.5E), INSAT-NAV-GSO4(83E), INSAT-NAV-GSO4(32.5E), INSAT-KA74E		
Jul-24			
Aug-24			
Sept-24			ORBITCONNECT 95E
Oct-24		ORBITCONNECT 95E	
March-25			

o Advance Publication of Information for Indian Satellite networks:

Month	API/A	API/B	API/C
Apr-24	TSAT		
May-24	LEAP-TD		
Jun-24		CGUSAT-1	
Jul-24	BELIEFSAT-0, FIREFLY		
Aug-24			
Sept-24	MICROSAT-2C	TSAT	
Oct-24	NST SWETCHASAT V0, RISAT-1B, IITMSAT, RESOURCESAT-3AS, VARUNA_TD	LEAP-TD	
Nov-24	BGS ARPIT SAT, LMI, LEAP-1		

vi) CoP Group of WPC Wing deals with the issuance of various types of proficiency certificate. As per ITU Radio Regulations (International treaty under the aegis of ITU-UN body responsible for development of ICT) Wireless Planning and Coordination Wing manages policy, framing of rules, conduct of examinations, grant of Certificate of Proficiencies and Licenses for the following:

- Radio Telephony Restricted (Aeronautical)
 - Global Maritime Distress and Safety System (GMDSS)
 - Amateur Station Operator CERTIFICATE (ASOC)/ HAM
- a) Radio Telephony Restricted (Aeronautical) Certification
- Offline to Online: Under SARAL Sanchar project, online application filing, receiving and processing for renewal of Radio Telephony Restricted (RTR-Aeronautical) has been implemented successfully in SARAL Sanchar portal of DoT. Further, RTR applications filing, receiving, processing and Admit. Card generation through online and done away of requirement of attestation for nationality certificate is implemented.
 - Transfer of RTR (A) examination to DGCA: Transfer of RTR(A) examination is under process, as DGCA has requested DoT to conduct RTR(A) examination up to June 2025. Hence WPC Wing DoT is conducting RTR(A) examination on interim basis.
- b) Global Maritime Distress and Safety System (GMDSS) Certifications
- Offline to Online: Under SARAL Sanchar project, online application filing, receiving and processing for renewal of Global Maritime Distress Safety System (GMDSS GOC) has been implemented successfully in SARAL Sanchar portal of DoT
 - GMDSS examination module: GMDSS examination Module is operational since December 2023 with features such as application filing, examination procedure and on spot document verification. The whole system is fully integrated. New fee structure for GMDSS service also included.
- o GMDSS Modernization:
- GMDSS General Operator Certificate (GOC) Syllabus for conduct of Course and Examination is revised in consultation with stakeholders w.r.t. latest developments as per decisions of International Maritime Organisation, conveyed by Directorate General of Shipping, Ministry of Ports, Shipping and Waterways.

- Regular approval has been given to 05 out of 22, GMDSS training institutes for period of 05 years till August 2029 for conduct of new modernized GMDSS GOC course and/or GMDSS GOC examination.
- o Issue of Guidelines for GMDSS Restricted Operator Certificate: In continuation to Ministry of Communications Gazette Notification No. GSR 1088(E) dated 05.11.2018 guidelines for conduct of GMDSS Restricted Operator's Certificated GMDSS ROC course and examination were released vide OM dated 17.08.2023.
- o Induction of GSR 674(E), Telecommunications (Commercial Radio Operator Certificate if Proficiency to Operate Global Maritime Distress and Safety System) Rules, 2024 for GMDSS services, published based on Telecommunication Act 2023. Following changes are made with respect to (Amateur Service) Rule, 2024.
 - Fresh GMDSS GOC Certificate fee changed from Rs. 5000/- to Rs. 10000/- (20 years) and Rs. 10000/- to Rs. 15000/- (Lifetime).
 - Renewal of GMDSS GOC Certificate fee changed from Rs. 5000/- to Rs. 10000/- (20 years) and Rs. 10000/- to Rs. 15000/- (Lifetime).
 - Late fee of GMDSS GOC Certificate Renewal changed from 2% per month to Rs. 1000/- (fixed, for upto 02 years from expiry of license).
 - Reappear in Part-II of GMDSS GOC Examination after two years and upto 05 years from expiry of license with fixed late fee of Rs. 1000/- for renewal of GMDSS GOC certificate.
- o Updation of Indian Coast Radio Stations in ITU:

Six new NAVTEX Coast Radio Stations which provide meteorological updates on dedicated marine frequency i.e. 518 KHz (internationally recognized by ITU vide its Radio Regulations) are updated in ITU list IV "List of coast stations". This update would enhance safety of seafarers, fisherman etc. through easy dissemination of meteorological warning.
- c) Reforms in Amateur/HAM Radio Certification
 - Induction of Telecommunication (Amateur Service) Rule, 2024 for change in Amateur Service Rules including change in fee structure for Amateur Service. Saral Sanchar module is developed and launched. Following changes are made with respect to (Amateur Service) Rule, 2024.
 - o Duplicate of ASOC fee changed from Rs. 100/- to Rs. 1000/-.

- o Change of Location fee changed from Rs. 200/- to Rs. 1000/-.
- o ASOC Examination Passing Criterion standardized to 40 percent for grant of ASO Certificate in both General and Restricted categories.
- o Late fee of ASOC Renewal changed from Rs 100/- per Half year to Rs. 1000/- (fixed, for upto 02 years from expiry of license)
- o Amateur Club fee changed from Rs. 1000/- to Rs. 2000/-.
- o Fee of Rs. 200/- introduced for grant of special call sign.
- o HAM certification application should be submitted within two years from date of declaration of result.
- Ongoing reforms w.r.t. Amateur Station Operator's Certificate (ASOC) Exam Simplification: Following steps are being implemented for simplification of Amateur Certification
 - o End to end process to be done by one DoT office: Single Scrutiny
 - o Automatic selection of call signs by the applicant through Saral Sanchar portal itself.
 - o Issue of auto-generated ASOC (HAM Radio) Certificate/license with QR code to the successful candidates in ASOC examination
 - o ASOC License can be self-generated by the candidate
- Special Call Sign for Kargil Vijay Diwas: On silver jubilee year of Kargil Vijay Diwas, eight special call sign awarded to different Amateur Clubs at location in Kargil on request of 'Forever In Operations' Division of Integrated HQ of the Ministry of Defence (Army) in Kargil.
- Following Special Call Sign issued for Amateur Experiments.

Special Call Sign	Purpose
AT8BRS	Celebration of World Amateur Radio Day
AU5J	Celebration of World Telecommunication & Information Society Day
AT3K	For CQ WPX Worldwide CW contest
AT1HQ	For IARU HF World Championship
AT24HFI	For HAMFEST INDIA 24

d) Statistical data of Certificates of Proficiency:

S. No.	Category	Actual Achievements (April 2024 to November 2024)	Anticipated Achievement (December 2025 to March 2025)
1.	Certificate of Proficiency Examination licenses		
1.1	No. of new Certificate of Proficiency license issued.	316	226
1.2	No. of Certificate of Proficiency license renewed.	99	70
2.	2.Radio Amateur Certificates		
2.1	No. of new Amateur license issued.	533	380
2.2	No. of Amateur license renewed.	15	10
2.3	Change of location of station	13	9
2.4	Special Call Signs issued	29	20

vii) T Group of WPC Wing deals with the frequency assignment/ management related work above 806 MHz for captive users as well as for Defence/ Security agencies. The recent achievements are mentioned below:

a) Revision of spectrum charges for captive users:

Revised charging order for captive wireless users is effective from 01.04.2024. There will be separate methodology for calculating annual spectrum charge for different radio-communication services. Socio-economic factor for Public Broadcasting services, area based categories like Pan-India, State/ District-wide for users like Defence, SPOs, Railways etc. has been introduced in the revised charging order.

b) Statistical data of frequency assignment issued by T Group:

S. No.	License Category	Actual Achievements from 01.04.2024 to 31.11.2024	Anticipated Achievements from 01.12.2024 to 31.03.2025
1.	New radio frequencies assigned to various users	241	120
2.	No of wireless station license schedule issued	1272	636
3.	No of wireless station license schedule renewed	8444	4222
4.	No. of radio frequency assignment for VVIP visits	24	12
5.	No. of radio frequency clearance for Experimental and demonstration license	32	16

viii) P Group of WPC Wing deals with the frequency assignment/ management related work below 806 MHz for captive users. The annual data of P group for the year 2024-25 (actual data up to November 2024 and anticipated data from December 2024 to March 2025 is as under:

S. No.	License Category	Actual Achievements from 01.04.2024 to 31.11.2024	Anticipated Achievements from 01.12.2024 to 31.03.2025
1.	No. of new Frequency Assignment issued	505	280
2.	No of wireless station license schedule issued	11235	1024
3.	No of wireless station license schedule renewed	97926	45716

ix) Administration & Coordination Group of WPC Wing deals with the staff related matters of WPC Wing. This group provides the necessary information of WPC Wing staff to Admin-II section of DoT for various service/ staff related matters. It is a nodal group of WPC Wing which coordinates with other groups, RLOs and different section of DoT for preparation of various types of reports/ returns. It also handles the budgetary requirement of WPC Wing and RLOs. It also handles the CAG audit reports issued from time to time. Recently, Administration & Coordination Group of WPC Wing has successfully provided ATNs for all the paras of CAG report No. 2 of 2022.

4.1.3 Regional Licensing Offices:

There are a total five Regional Licensing Offices (RLOs) of WPC Wing located at New Delhi, Mumbai, Kolkata, Chennai & Guwahati and work under the control of WPC HQ, New Delhi. They deal with public related activities such as the issue & renewal of VHF licenses in the frequency band 136 – 174 MHz, non-network licenses, and certificates of proficiency, type approvals and conduct of certificate of proficiency examinations. Some statistics of these RLOs are shown below:

a) RLO Chennai:

S. No.	License Category	Actual Achievements from Apr-24 to Nov-24		Anticipated Achievements from Dec-24 to Mar-25	
		Issued	Renewed	Issued	Renewed
1	Wireless Licenses				
1.1	Fixed /Land mobile-HF/VHF/UHF	12	00	05	00
1.2	Import licenses	445	03	220	01
1.3	Import License(Self Declaration mode)	127	06	60	02
1.4	Experimental License (Non-radiating under Self Declaration)	448	158	220	70
1.5	Experimental License(Radiating mode)	62	34	30	15

1.6	Manufacturing License (under Self Declaration mode)	04	00	01	00
1.7	Demonstration License (Indoor/ Non-Radiating under Self Declaration mode)	03	00	01	00
1.8	Demonstration License (Outdoor/ Radiating mode)	09	00	04	00
1.9	UHF Short Range Radio (USR) License	04	157	01	70
1.10	Aeronautical Mobile Station(AMS) License	20	23	08	10
1.11	Maritime Mobile Station(MMS) License	04	41	01	20
1.12	ETA Certificate	13	00	06	00
2	Certificate of Proficiency (COP) Certificate/ License				
2.1	Radio Telephony Restricted (RTR)Certificate/License	169	00	85	00
2.2	Global Maritime Distress and Safety System (GMDSS)/ GOC Certificate/License	440	305	220	140
3	Certificate of Proficiency (COP) Certificate/ License (Examination details)				
3.1	Number of Candidates admitted for RTR(A) examination	4169		–	
3.2	Number of Candidates admitted for GMDSS examination through SRHQ	664		320	

b) RLO Mumbai:

S. No.	License Category	Actual Achievements from Apr-24 to Nov-24		Anticipated Achievements from Dec-24 to Mar-25	
		Issued	Renewed	Issued	Renewed
1	Wireless Licenses				
1.1	Import licenses	15	0	8	0
1.2	Import License (Self Declaration mode)	331	10	166	5
1.3	Experimental License (Non-radiating under Self Declaration)	91	18	46	9
1.4	Experimental License (Radiating mode)	4	1	2	0
1.5	Manufacturing License (under Self Declaration mode)	11	0	6	0
1.6	Demonstration License (Indoor/ Non-Radiating under Self Declaration mode)	2	NA	1	NA
1.7	Demonstration License (Outdoor/ Radiating mode)	12	NA	6	NA
1.8	UHF Short Range Radio (USR) License	12	337	6	169
1.9	Aeronautical Mobile Station (AMS) License	36	60	18	30
1.10	Maritime Mobile Station (MMS) License	73	287	37	144
1.11	VHF licenses (136-174 MHz)	16	0	8	0

2	Certificate of Proficiency (COP) Certificate/ License				
2.1	Radio Telephony Restricted (RTR) Certificate/License	461	0	0	0
2.2	Global Maritime Distress and Safety System (GMDSS)/ GOC Certificate/License	484	438	242	219
3	Certificate of Proficiency (COP) Certificate/ License (Examination details)				
3.1	Number of Candidates admitted for RTR(A) examination	2645		–	
3.2	Number of Candidates admitted for GMDSS examination through WRHQ	475		275	

c) RLO Kolkata:

S. No	License Type	Actual Achievements from Apr-24 to Nov-24		Anticipated Achievements from Dec-24 to Mar-25	
		Issued	Renewed	Issued	Renewed
1.	Wireless License				
1.1	Fixed /Land mobile-HF/VHF/UHF	7	0	13	0
1.2	Import licenses	5	0	2	0
1.3	Import License (self-declaration)	119	0	30	0
1.4	Experimental License (non-radiating)	14	0	8	2
1.5	Experimental License (radiating)	2	1	7	0
1.6	Manufacturing License (under self-declaration)	3	1	0	0

1.7	Demo License issued (indoor/ non-radiating) under self-declaration	0	0	2	0
1.8	Demo(outdoor/ radiating)	2	0	0	0
1.9	UHF Short Range Radio (USR)	0	20	0	8
1.10	Aeronautical Mobile Station License (for aircrafts)	1	1	0	13
1.11	Maritime Mobile Station License (for Ships)	9	23	0	28
1.12	ETA-scrutiny based	2	0	2	0
2.	Certificate of Proficiency (COP) Certificate/ License				
2.1	Radio Telephony Restricted (RTR) certificate/ license	27	0	283	0
2.2	Global Maritime Distress and Safety System (GMDSS)- GOC certificate	591	260	269	165
3.	Certificate of Proficiency (COP) Certificate/ License (Examination details)				
3.1	No. of candidates admitted for RTR Examination.	1368		905	
3.2	No. of candidates admitted for GMDSS Examination. (Through ERHQ)	588		294	

d) RLO Delhi:

S. No.	Type of Licenses	Actual Achievements from Apr-24 to Nov-24		Anticipated Achievements from Dec-24 to Mar-25	
		Issued	Renewed	Issued	Renewed
1.	Fixed /Land mobile-HF/VHF/UHF	220	0	110	0
2.	USR	3	117	1	60
3.	AMSL	232	232	120	150
4.	MMSL	2	2	1	2
5.	VHF	85	0	100	0
6.	Import	604	0	300	0
7.	Experimental/Demo	135	38	70	20
8.	ETA	2	0	0	0
2.	Certificate of Proficiency (COP) Certificate/ License				
2.1	Radio Telephony Restricted (RTR) certificate/ license	774	0	100	0
2.2	Global Maritime Distress and Safety System (GMDSS)- GOC certificate	497	182	250	100
3.	Certificate of Proficiency (COP) Certificate/ License (Examination details)				
3.1	No. of Candidates appear for GMDSS exam	555	-	280	-
3.2	No. of Candidates appear for RTR(A) exam	1848	-	2500	-

e) RLO Guwahati:

S. No.	Type of Licenses	Actual Achievements from Apr-24 to Nov-24		Anticipated Achievements from Dec-24 to Mar-25	
		Issued	Renewed	Issued	Renewed
1.	No. of New Frequencies Assigned to various users	35	0	18	0
2.	No. of License schedule	125	38	80	50
3.	No. of Import Licenses	17	0	10	2
4.	No. of Experimental License	2	0	2	0
5.	No. of Demo License	0	0	2	0
6.	No. of USR License	1	0	5	0

4.1.4 Wireless Monitoring Organization (WMO):

WMO is the nodal agency for providing interference free spectrum to millions of end users in the country. Wireless monitoring is an integral part of the spectrum management. WMO, a subordinate office of the Wireless Planning and coordination (WPC) Wing, carries out spectrum monitoring through a network of 1(one) International Satellite Monitoring Earth Station (ISMES), 5 International Monitoring Stations (IMSSs), and 22 Wireless Monitoring Stations (WMSs), strategically located all over India. WMO is also equipped with 5 Radio Noise Survey Units, which undertake detailed and complicated measurements to aid in the spectrum management activity. As wireless monitoring for spectrum management is a specialized activity, Officers of Indian Radio Regulatory Services (IRRS) are posted in WMO for ensuring interference free spectrum for public telecom services and wireless users. In addition, WMO, with its 10 Inspection Units, carries out physical inspection of wireless installations. WMO in its Headquarter located at Pushpa Bhawan, New Delhi has three verticals. (i) Planning and Implementation (PI) Cell, (ii) Monitoring Cell, (iii.) Administration Cell. While Administration Cell is looking after the day to day admin activities of WMO, the functions of PI cell and Monitoring Cell are detailed as under:

- a) The Planning and Implementation (PI) Cell of Wireless Monitoring Organisation, (WMO) Headquarters is entrusted with the comprehensive development and management of both the civil and technical infrastructure of WMO and all its field units. On the civil front, the core activities of PI section include planning and establishment of new

monitoring stations, land procurement, construction/up-gradation of various civil facilities, making rented accommodation available for field units which do not have offices on their own land, coordination with Estate Division (DoT HQ) for implementation of Presidential Order (PO) and requirement of land for field offices of WMO through monetization of land of BSNL. Additionally, the section manages the repair and maintenance of these civil infrastructures.

On the technical front, PI Section is responsible for keeping the Organisation in sync with the rapid technological advancements and procure latest equipment to meet spectrum monitoring needs of the Organisation. This includes procurement of spectrum analyzers, monitoring receivers, direction finding devices, noise measurement devices, IMT network analyzers, integrated mobile monitoring terminals etc. PI Section is also involved in procurement of operational vehicles for the field units of WMO to enable them perform their mobile monitoring activities.

Beyond these responsibilities, the PI Section also oversees other procurements that exceed the financial powers of the heads of field units. This ensures the smooth operation and maintenance of WMO's infrastructure, reflecting the comprehensive and crucial role of the PI Section in the functioning of the WMO and its field units.

b) Significant Works of PI Section during 2024-25:

- Procurement of Monitoring Equipment

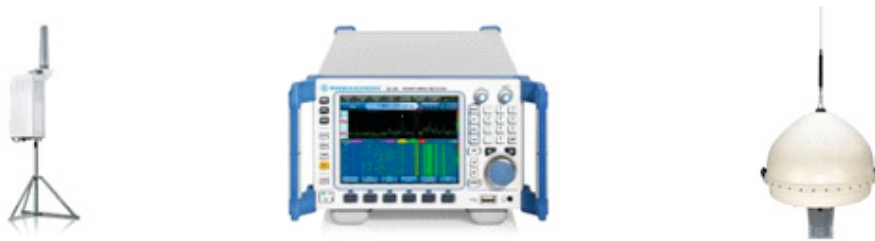
Monitoring stations were earlier equipped mainly with Handheld Spectrum Analysers procured during 2014-16. These devices, operating in the range of 1 MHz to 20 GHz along with 3G/4G cell ID kits, have been instrumental in resolving RF interference complaints and ensuring optimal utilization of the scarce radio spectrum.

PI Section has made significant strides in last two financial years, enhancing its technical radio monitoring infrastructure and thereby strengthening its field units. PI Section's efforts have been focused on keeping pace with the rapid technological advancements in the Radio Frequency (RF) field. In last two financial years WMO has successfully procured Radio Network Analysers, Radio Receivers and Fixed HF Monitoring Facility with direction finders.

With the intensified efforts in procurement of various modern technical infrastructure, WMO in the year 2024-25, has added the following three state of the art monitoring equipment in its technical infrastructure.

o Fixed VHF/UHF along with DF Monitoring Facility:

Procurement has been completed successfully for 5 nos. of Fixed-V/UHF along with Direction Finding facility. This is one of the esteemed project which would enhance the Direction Finding capabilities of WMO to detect the direction and location of unauthorised radio emissions (interferer) in V/UHF frequency range. This facility would be highly beneficial for measurement of frequency bandwidths, radiated power, transmission schedule as per licensing parameter and detecting any unauthorized transmission in licensed bands and interference resolution issues reported by the authorized wireless users in the entire V/UHF range.



Fixed V/UHF along with DF facility

o Handheld Spectrum Analyser Solution (1-80 GHz):

23 Nos. of Handheld Spectrum Analyser Solution (1-80 GHz) have been successfully commissioned and deployed in its field units. This equipment will enable WMO to carry out spectrum monitoring and interference resolution in higher frequency ranges including E bands and V bands. This solution is equipped with advance monitoring softwares that even help in detecting embedded signals (signal within signal) and identifying modulation types of signals.



Handheld Spectrum Analysers (1-80 GHz)

o Radio Noise Survey Equipment:

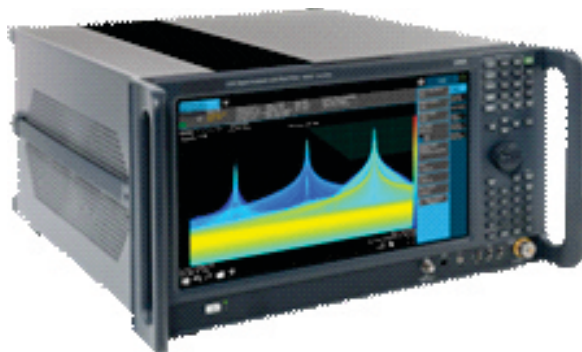
In the year 2024-25, orders have been successfully placed for procurement of 5 nos. of Radio Noise survey equipment to be deployed at the five Noise Measurement units located in Mumbai, Kolkata, Chennai, New Delhi and Hyderabad. This sensitive equipment is capable of measuring noise in the RF Environment. This device will be helpful in identifying areas of RF coverage and any factors that will adversely affect the performance of the wireless (RF) networks.



Radio Noise Survey Equipment

o Comprehensive AMC of Spectrum Analysers:

Comprehensive Annual Maintenance Contracts are in place for 21 Handheld Spectrum Analysers and 2 Real Time Spectrum Analysers, ensuring smooth functioning and timely rectification of faults in these equipment.



Real Time Spectrum Analyser



Handheld Spectrum Analyser

- **Procurements of Operational Vehicles:**

During 2024-25, three nos. of operational vehicles have been procured for monitoring stations located in Shillong, Dehradun and Jammu. These vehicles will enable these units to effectively carrying out mobile monitoring assignments.

- **Training of Personnel:**

In a collaborative effort with relevant agencies, the PI Section in 2024-25 has successfully conducted comprehensive training programs for our monitoring personnel. These were part of the procurement contacts and were designed to familiarize them with the newly procured Fixed-V/UHF facility, Handheld Spectrum Analyser Solution (1-80 GHz) and Radio Noise survey equipment.

The training was meticulously structured to provide hands-on experience, ensuring that the personnel could navigate the complexities of these advanced tools with ease. By delving into the detailed functionalities of the equipment, they have been empowered to harness the full potential of these state-of-the-art devices. Such training not only enhances technical proficiency of the staff but also significantly boosts monitoring capabilities, setting a new benchmark in operational excellence.



Comprehensive training programs for monitoring personnel

- Completion of Office Building of WMS Raipur: The construction of office building of WMS Raipur has been completed this year. It was officially handed over to WMO by CPWD and formally inaugurated in June 2024.



Newly constructed office building of WMS Raipur

The organization's strategic investment in cutting-edge technical equipment has markedly bolstered its infrastructure. With the Project Implementation (PI) section's continued efforts to enhance the capacity of the WMO, the organization is well-positioned to meet future challenges and achieve even greater operational efficiency and success.

c) Monitoring Cell of WMO is entrusted with the monitoring of Radio Frequency signals to ensure efficient and interference-free use of the radio frequency spectrum across India. The following are the key achievements towards the above objective:

- Detection of cellular mobile signals along Indo-Nepal international border areas of Uttar Pradesh

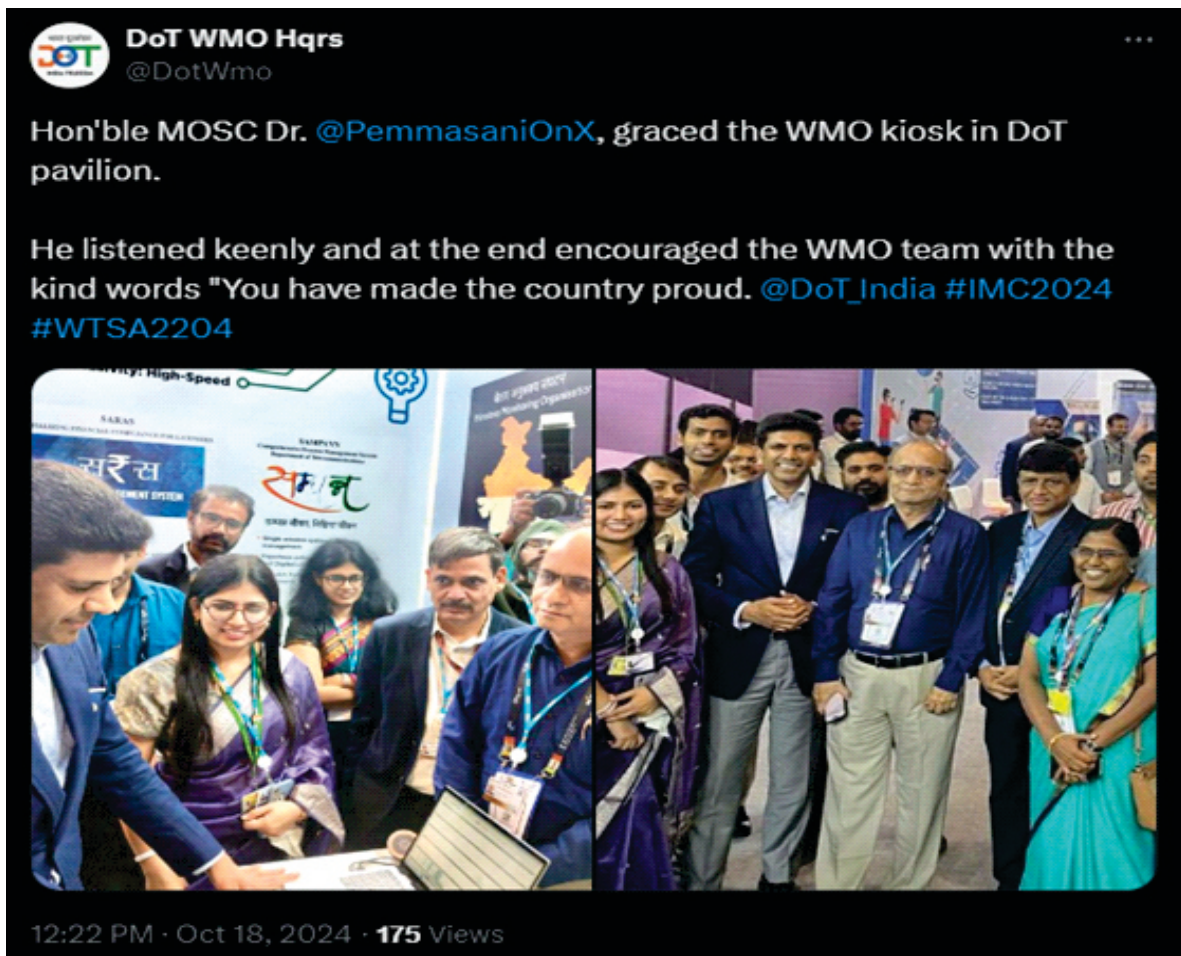
WMO has carried out cellular signal spillage monitoring exercise along Indo-Nepal international border by WMS Lucknow and WMS Gorakhpur at 193 no. of locations in 7 no. of districts of Uttar Pradesh namely Bahraich, Lakhimpur Kheri, Pilibhit, Balrampur, Shravasti, Siddharthnagar and Maharajganj. During this exercise, mobile signals from Nepal based telecom Operators have been detected at all 184 no. of locations in all above-mentioned districts of Uttar Pradesh. The signals of Nepal telecom operators namely Namaste, Ncell were intercepted by the

team of officers from WMS Lucknow and WMS Gorakhpur. These Nepal telecom operators were identified by their mobile network codes and mobile country codes detected during the course of this monitoring exercise. The report with all measurements has been forwarded to WPC Wing of Ministry for further necessary action.

- Exhibition of WMO Stall at WTSA 2024 at Bharat Mandapam, Pragati Maidan New Delhi from 14.10.2024 to 24.10.2024:

WMO presented its monitoring capabilities, key activities and perspective on interference resolution including importance of monitoring at WMO stall in World Telecommunication Standardization Assembly (WTSA) 2024. Following new monitoring equipment of WMO had also been presented during WTSA 2024.

- o Radio Receiver
- o 5G Network Analyzer



Prominent visitors at WMO stall during WTSA 2024 were Hon'ble Minister of State for Communications, Advisor to Hon'ble PM, Secretary (T), Member (T), Member (F) and Advisor

- Monitoring exercise conducted by field units along Indo-Pak and Indo-China international border areas of J&K, Ladakh, Himachal Pradesh-Tibet and Uttarakhand- Tibet

Monitoring exercise was carried out by field units of WMO namely WMS Jammu (30 Locations), WMS Jalandhar (10 Locations) and WMS Dehradun (10 Locations) to carry out the monitoring exercise in Indo-Pak and Indo-China international border areas of J&K, Ladakh, Himachal Pradesh-Tibet and Uttarakhand-Tibet respectively.

It was observed that the band (2900-3300 MHz) was active at 75% of monitored locations and the band (3300-3400 MHz) was active at 68% of the monitored locations.

- Surveillance spectrum monitoring during IMC 2024 at Delhi

For smooth and interference free communication network during India Mobile Congress (IMC) 2024, teams of IMS Delhi were deployed so that no interference faced by any services/ users during IMC-2024. Monitoring was conducted throughout the event to ensure an interference-free network, optimizing performance and stability. As a result, the event was completed successfully.

- Measurement of 5G in band (3500 MHz to 3600 MHz) signal level at a lateral distance of 700 meters with different altitude.

It is informed that DGCA has shared the technical inputs provided by aircraft OEMs and further, TSPs have analysed the information shared by DGCA.

Thereafter, TSPs submitted a proposal constituting reduced protection zone 700 X 200 meters in lieu of current no C band zone of 2100 X 910 meters to DGCA. An ex-post facto assignment has been issued to IMS Delhi for providing assistance to monitoring team including officials of WPC Wing, Department of Science & Technology and M/s RJIL.

In this regard, monitoring has been carried out at 5G Site near IICC Dwarka by the monitoring team to Measure 5G in band (3500 MHz to 3600 MHz) signal level at a lateral distance of 700 meters with different altitude. The report has been submitted by monitoring team for perusal.

- Resolution of interference reported by M/s BAL in Chandigarh and nearby areas

WMO Jalandhar has carried out monitoring exercise on the issue of interference faced by M/s BAL at Chandigarh and nearby areas. WMO

observed spillover interference from Defence operations into the Airtel network's 1710-1725 MHz band.

Following this observation, coordination was carried out with the Defence authorities, who subsequently made corrections to their technical parameters. As a result, the interference affecting M/s BAL has been resolved.

- Monitoring of frequency band 2700-2900 MHz band assigned to AAI for Airport Surveillance Report (ASR) facility in the airports

The assignment was issued to 16 nos. of WMS/IMSs for carrying out monitoring of frequency band 2700-2900 MHz band at 10 nos. of locations assigned to AAI for Airport Surveillance Report (ASR) facility in the airports. The monitoring stations were required to monitor carrier frequency, bandwidth in use, coverage area and radiation pattern

The compiled monitoring report has been forwarded to WPC Wing for necessary action.

- Observation of out of band emission during monitoring at Jaipur

WMO Ajmer has carried out monitoring in Jaipur in coordination with M/s BSNL and M/s Tejas in order to resolve the interference effaced by M/s Arya Omni Talk in Jaipur.

During monitoring exercise, it was found that in 10 MHz Bandwidth scenario (793-803 MHz), signals of BSNL sites are detected between 788.2-809.97 MHz and in 5 MHz Bandwidth scenario (793-798 MHz), signal of BSNL site are detected between 792.21-798.34 MHz.

Therefore, M/s BSNL has been instructed to take corrective measures i.e install suitable filters at their end to restrict the signals from transmitting beyond their allocated spectrum within one month in order to resolve the interference faced by M/s Arya Omni talk in Jaipur City.

- High Priority Spectrum Monitoring Assignments

The quantitative analysis pertaining to spectrum monitoring carried out with in WMO with effect from 01.04.2024 to 31.10.2024 is tabulated given below:

S. No.	Particulars	Actual performance during the period from 01.04.2024 to 31.10.2024	Anticipated performance during the period from 01.11.2024 to 31.03.2025
1.	Monitoring assignment handled	1882	1400
2.	No. Wireless Transmission monitored	32485	23500
3.	Technical Assistance rendered to users to maintain their operations within specified standards	335	240
4.	Infringements communicated to wireless users for remedial actions	203	145
5.	Channel hours utilized for Radio Monitoring	65628	47000
6.	No. of Wireless Stations Inspected	21031	18100
7.	No. of Radio Noise Measurements done	74707	53500
8.	No. of High priority / Standard interference complaints resolved	1463	1045
9.	No. of assignment completed related to national security	85	61

WMO is continuously striving in the field of spectrum monitoring for keeping the RF Spectrum clean which is being used by people/entities.

a) Satellite Monitoring:

Spectrum is a limited scarce resource and in order to ensure optimum utilization of spectrum each country undertakes regular monitoring exercises for spectrum. A satellite monitoring station can provide coverage of satellite emissions depending on the satellite footprint, thereby, covering at times the territory of several countries.

Satellite monitoring facility of WMO protects the India Satellite System from getting interfered from foreign satellites and detect the beacon signals for satellite identification and measurement of technical parameters on regular basis.

To ensure quality of services, satellite spectrum must be used by service providers as per terms and conditions approved by the Government. Regulatory measures must be enforced.

Upon the proliferation of private players in providing satellite-based services in broadcasting and telecommunication sectors such as DTH, Satellite TV broadcast, DSNG, VSAT etc. from the year 2000 onwards, the Satellite Monitoring facility of WMO has taken initiatives for enforcing the remedial/corrective action for Satellite Service Providers with regard to their adherence to the licensed technical parameters, infringement in satellite usages, unauthorized up-linking etc.

- Satellite Monitoring Facility
 - o WMO's International Satellite Monitoring Earth Station (ISMES), situated at Jalna, Maharashtra; monitors the satellite occupancy in Geostationary satellite orbit arc over India ranging from 20 degrees east to 140-degree East in S-band, Lower C band, C Band, Extended C band and Ku Band. ISMES Jalna also has capability to analyse the signal in Real Time Mode which is useful in identifying the interfering signal. ISMES Jalna is notified and published in List VIII (List of International Monitoring Stations) of International Telecommunication Union (ITU) Geneva.
 - o WMO also has the small satellite monitoring facility at WMS Trivandrum.
- Satellite Monitoring Activities Undertaken: The following are the significant activities undertaken:

Violation of authorized Technical parameters by Licensees of satellite-based services: International Satellite Monitoring Earth Station (ISMES), Jalna has carried out monitoring of authorized technical parameters viz.

 - o Type of Modulation

- o Forward Error Correction (FEC)
- o Carrier of the Licensees of satellite-based services.

Total 2 number of violations to authorized technical parameters have been detected. Accordingly, 2 number of Infringement Notices (INF) to the respective Teleport licensees for violation of authorised technical parameters have been issued during the period April- October, 2024.

Annual Performance output Statics of Satellite Monitoring:

S. No.	Particulars	Achievements (Apr'24-Oct'24)	Anticipated (Oct'24-Mar'25)
(i)	No. of satellite Monitoring Assignment undertaken	67	50
(ii)	No. of satellite Monitoring assignment cleared	67	50
(iii)	No. of satellite monitored	45	32
(iv)	No. of satellite transponder/ carrier monitored	150/719	110/513
(v)	No. of satellite carrier identified	418	300
(vi)	No. of high priority satellite interference cases reported & resolve including satellite based public service operators	01	02
(vii)	No. of Channel hours utilized for satellite monitoring work	840	600
(viii)	No. of Infringements issued	02	04

4.2 Telecommunication Engineering Centre (TEC)

Telecommunication Engineering Centre (TEC) is an attached office and technical arm of department primarily responsible to formulate standards that promote quality of equipment, systems and services for harmonious growth of communication infrastructure. It also develops new standards for emerging technologies and services. It provides testing & certification of goods and services for ensuring inter-operability, quality and safety, apart from advising Government in technological matters. Keeping pace with the changing roles and policies of the Government, Telecommunications Engineering Centre has evolved into a knowledge hub, advisory body and think tank in the telecommunications and Information & Communication Technologies (ICT) sector to provide technical expertise to the Government and industry for sustainable and harmonized growth of communication infrastructure in the country. TEC has implemented Quality Management System (QMS) and has been granted ISO 9001:2015 certification. TEC is actively involved in standardization efforts related to new technologies such as 6G and has led the Indian effort at ITU-R in adoption of India specific requirements of Ubiquitous Connectivity, Coverage, Interoperability, and Sustainability in the ITU-R IMT-2030 framework document.

4.2.1 Functions:

At present, Telecommunication Engineering Centre is (carrying out)/ mandated with following important functions related to standardization, testing, certification, accreditation etc. as given below:

- i) Formulation of Standards (Generic Requirements, Interface Requirements and Service Requirements) in the field of telecom and related ICT sector,
- ii) Formulation of Technical Regulations {Essential Requirements (ER)} and administering Mandatory Testing & Certification of Telecom Equipment (MTCTE) framework as Telegraph Authority,
- iii) Promoting standardization in telecom & related IT sector,
- iv) Certification of Equipment/ Interfaces/ Services against TEC Standards and issuing Type Approval/ Interface Approval/Service Approval Certificates (TAC/ IAC/ SAC),
- v) Granting Certificate of Approval (CoA) against vendor specifications,
- vi) Conducting field trials and validation of Technology/ Product,
- vii) Granting Technology Approval to R&D Organizations such as C-DOT etc,
- viii) Nodal agency for International Telecommunication Union (ITU)-T related National Working Groups,

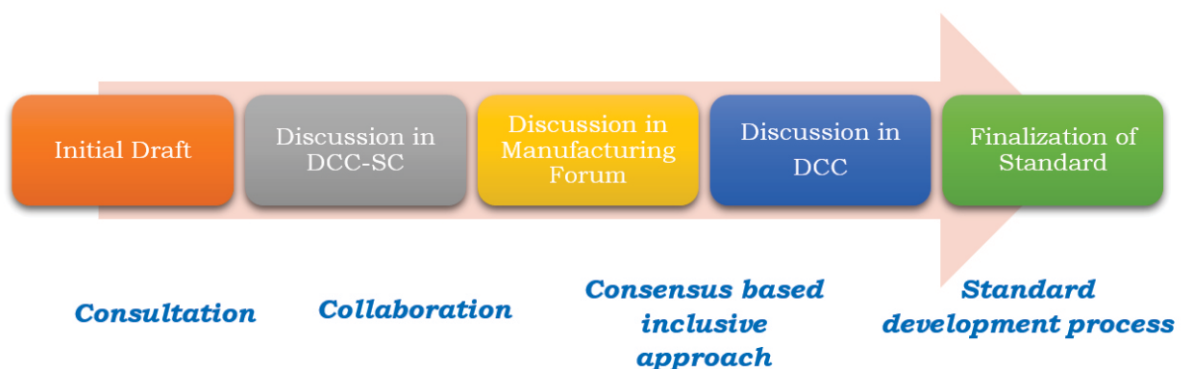
- ix) Participation in the pre-standardization/ standardization activities of international Standardization Organizations, viz. ITU-T, ITU-R, APT, IEEE, WRC, IETF, ETSI 3GPP, ORAN, OneM2M etc,
- x) Designation Authority for domestic Conformance Assessment Bodies (CAB) and Certification Bodies (CB),
- xi) National Enquiry Point for WTO –TBT (Technical Barrier to Trade) agreement for telecom sector.
- xii) TBT Enquiry:
 - a) Notification issued by TEC which require updating on WTO TBT Portal are processed and suitably taken up with Dept. of Commerce for uploading on WTO TBT Portal.
 - b) Reply of TBT related queries shall be dealt as and when received from member countries.
 - c) TBT Concerns of Indian Manufacturers will be suitably taken up with Member Countries as and when received.
- xiii) Nodal agency for Complaint resolution against local content under PPP-MII (Public Procurement Preference to Make in India) policy of DoT,
- xiv) PPP MII Complaint: The PMI Complaints received in TEC from Public Procuring entities / Bidders on Local Content matters shall be processed as per approved procedure.
- xv) Designated Testing and Certification Agency for Conditional Access System (CAS) and Subscriber Management System (SMS) used for Broadcasting and Cable TV services,
- xvi) Providing technical advice/ inputs for implementation of Production Linked Incentive Scheme of DoT,
- xvii) Preparing study papers/white papers on the standards, facilities and features of the telecom equipment, systems and services to keep abreast with the latest technological developments,
- xviii) Conducting knowledge sharing sessions/ workshops with relevant stakeholders in the field of telecom technology, policy, technology roll out, standardization and processes.

Aforementioned activities are carried out through various specialized core divisions of TEC such as Mobile Technology, Quantum Technology, Radio-communication, Satellite communication, Future Networks, Telecom Security, Internet of Things (IoT), Information Technology, Transmission, Fixed Access, Convergence & Broadcasting, Standardization, MTCTE, and Indigenous Manufacturing Promotion & TBT Enquiry Point etc. The performance of TEC in its principal activities are indicated below:

4.2.2 Development of Standards

For harmonious and orderly growth of telecom network/ services and to realize the vision of AtmaNirbhar Bharat, proper eco-system of standardization, accreditation, testing and certification is necessary. As a National Standards Body for telecom & related IT domain, TEC develops National Standards through a consultative mechanism in various technical committees comprising of various related stakeholders so that views of all are given due consideration and a consensus is evolved while formulating a standard. These standards and certifications are generally voluntary in nature. As per the licence conditions of Unified licence, Telecom Service Providers (TSPs) are mandated to follow TEC standards. In addition, the DoT policy on PPP-MII mandates that notified products procured by public procuring entities should comply with TEC standard.

- i) Standards Development Process: TEC develops standards through a well-established comprehensive multi-tier consultation process involving diverse stakeholders viz. industry, service providers, business/ industry associations/ consortiums, academia, R&D organizations, scientific bodies, subject experts, consumer representatives and Government departments/ organizations. TEC endeavors to align the Indian Standards with the International Standards, wherever available and to the extent possible keeping in consideration Indian conditions and needs. Various steps of standard development process are depicted below:



- a) **Development Coordination Committee (DCC):** DCC consists of representatives from various stakeholders such as DoT, relevant Government Departments/ Organizations, Service Providers/ Industry Associations, C-DOT, NTIPRIT, BSNL, BBNL, TCIL, ITI, NCCS, etc. Separate DCCs are constituted for different technology domains such as mobile, radio, EMI/EMC, satellite communication, fixed networks, switching, transmission, telecom security, transmission, IoT, ICT and broadcasting etc. comprising of relevant members. DCC is the final body for recommending the draft TEC Standard for approval.
 - b) **DCC Sub-Committee:** Each DCC have a DCC Sub-Committee. DCC Sub-Committee is a group of working-level experts drawn from Service Providers/ User organizations, Industry Associations, Testing Laboratories and middle management level officers of DoT, TEC, DoT units & other related Government departments.
 - c) **Draft for Comments (DFC) Group:** DFC Group consists of experts for a particular family of network elements from R&D Institutions, reputed academic institutions such as IITs. Research units of user organizations, service providers etc.
 - d) **Manufacturers' Forum (MF):** Manufacturers' Forum is a group of technical representatives of manufacturers/OEMs, suppliers, representatives of a network element or a group of network elements and any related Industry Associations etc.
- ii) **Standard for Generic Requirements for a Product/ Equipment:** It lays down requirements to work seamlessly in Indian Telecom Network and comprises of - Interconnectivity and interoperability requirements, Quality requirements, EMI/EMC requirements, Safety requirements, Security requirements, any other equipment requirements that are considered generic and Desirable requirements, if any.
- TEC has issued 488 Standards for products/ equipment, so far. Type Approval Certificate (TAC) is issued for conformance against the Standard for a Product/Equipment.
- iii) **Standard for Interface Requirements:** The Standard for Interface Requirements for a Product/Equipment refers to the requirements of an interface between two network elements at different layers of protocol stacks as applicable.
- iv) **TEC has issued 60 Standards for interfaces, so far. Interface Approval Certificate (IAC) is issued for conformance testing against the Standard for Interface Requirement for a Product/Equipment.**

- v) **Standard for Service Requirements:** It details the services and network related requirements for specific applications, which should be met by service providers. TEC has issued 13 Standards for Service requirements, so far.
- vi) **Test Guide:** The Test Guide (erstwhile Test Schedule and Test Procedure (TSTP)) is associated with Standards. Test Guide describes testing and measurements to be performed as per Standard of a Product/Equipment, Interface or Service.
- vii) **Cross-sector and Service Sector Standardization:** In the convergence era, the need of standards is not only increasing in the core telecom sector but also horizontal use of ICT in the different sectors is necessitating the need of cross-sector standardization at increasing scale which includes many telecommunications enabled core and ancillary services in different sectors.
- viii) **Standards for equipment used in Broadcasting Sector:** In the converged world, technologies and services of telecom and broadcasting sectors overlap each other. To give due importance and impetus to the standardization needs of the evolving technologies related to Convergence and Broadcasting, a dedicated division is functioning in TEC.
- ix) **Adoption of Standards:** TEC also adopts standards of different domestic/ international standardization bodies in accordance to 'TEC Standardization Guide', which inter alia outlines the adoption process and institutional mechanism for adoption of domestic /international telecom standards' by incorporating the national requirement (human health, safety, security, environment protection, geographical and climatic conditions etc.) and national priorities. The review of "Standardization Guide" - a policy on adoption of Domestic/International Standards into National Standards by TEC issued vide OM dated 08.05.2020 was undertaken and accordingly, the Standardization Guide has been modified vide OM dated 22.05.2024. TEC has adopted more than 600 standards of various standardization bodies such as oneM2M, 3GPP etc.
- x) **Important Standards developed during the year:**
 - Standard on "Fairness Assessment and Rating of Artificial Intelligence Systems." [TEC 57050:2023]
 - Standard for Converged Gateway Node for Delivering Broadcast Content to Portable Devices Through Wireless LAN (TEC 57040:2023):
 - Use of TEC Standard "Band Pass Filter for C-Band Satellite Earth Receivers in 3700-4200 MHz with 30 MHz Guard Band (TEC 57030:2022)"

- Standard for GR on Hybrid (AC+DC) uninterrupted power supply system (TEC 66160:2024).
- Revision of Standard for GR on Lithium Ion Battery for Telecom Applications (TEC 67030:2024).
- Revision of Standard for GR on SMPS Based Power Plants (TEC 66110:2024).
- Revision of Standard for GR on Lightening for surge protection of telecom site (TEC 66130:2024).
- Standard for GR on Combo PON OLT Access Equipment (TEC 71140:2024).
- Test Guide on Hybrid (AC+DC) uninterrupted power supply system (TEC 66161:2024).
- Test Guide on SMPS Based Power Plants (TEC 66111:2024).
- Revision of Test guide on Lithium Ion Battery for Telecom Applications (TEC 67031:2024).
- Revision of Test Guide on Lightening for surge protection of telecom site. (TEC 66131:2024).
- Test guide for implementation of MNP regulation for new entrants [upto the Telecommunication Mobile Number Portability (7th Amendment) Regulations, 2018]
- Standard for Metal Free Optical Fibre Cable with double HDPE (TEC 85240:2023))
- Metal Free Ribbon Optical Fibre Cable with Double HDPE Sheath for underground duct application (TEC 85250:2023)
- Revision of Standard for GR on Optical Fiber Splicing Machine and Revision of Standard for GR on Ribbon Optical Fiber Splicing Machine has been taken up. Sub DCC and MFF has been held on 22/08/2023, DCC and finalization of standard has been targeted for Q4. 2023-24.
- Revision of Standard for GR on ADSS Optical Fiber Cables for laying along power line alignments has been planned for Q4 2023-24.
- Revision of Standard for GR on Armoured Optical Fiber Cables for Duct Application has been planned for Q4 2023-24.
- Formation of a new Standard for GR on Armoured Ribboned Optical Fiber Cables for Duct Applications has been planned for Q4 2023-24.
- Standard for GR on Router for MPLS based Transport Network (TEC 48050:2024) revised in Jul 2024.

- Standard for GR on LAN Switch (TEC 48060:2024) revised in Jul 2024.
- Standard for Geographical Information System (GIS) inputs given to DoT HQ in Aug 2024.
- Standard for ER on Hypervisor revised in April 2024.
- Standard for ER on IP Security Equipment revised in Sep 2024.
- Standard for ER on LAN Switch revised in Sep 2024.
- Standard for Generic Requirements (GR) on Open-Radio Access Network (O-RAN) (TEC 21110:2024)
- Revision of Test Guide on Mobile Number Portability (TEC 23016:2024) [Telecommunication Mobile Number Portability Regulations, 9th amendment]
- Test Guide on Calling Name Presentation Service (TEC 23046:2024)
- Revision of Essential Requirements (ER) of Base Station for cellular network (TEC42722410).
- Revision of Standard for Non-Geostationary Orbit (NGSO) Satellite Communication Networks in Fixed Satellite Service (FSS) (TEC 42032:2024)
- Standard for Assessment of electromagnetic field exposure from telecom base stations (TEC 13019:2024)
- Standard for Anti-Drone Systems

4.2.3 Testing

- i) Testing Ecosystem Development: TEC is consistently working for development of testing ecosystem in the country, which not only enhances quality of equipment, network and services but also enables start-ups/ MSMEs easy access to test facilities for experimentation.
- ii) Testing Labs in TEC: With the objective of making India AtmaNirbhar in telecom testing capacity, apart from designating private test labs as Designated CABs, TEC has also set up state-of-art labs for various advanced testing domains. TEC have NGN transport lab, IPv6 Ready Logo lab, Control Lab (meant for testing 4G & IP Multimedia systems) and Green Passport Lab (meant for energy efficiency testing). These advanced testing facilities can also be made available to domestic start-ups, SMEs, incubators, developers, R&D organization, manufacturers, academia and research scholars for experimentations and to boost their indigenization efforts.
 - a) Control Lab (also commonly known as Mobile Core Testing Lab): The Lab has the capability of testing LTE Core Networks and IP Multimedia

Subsystem (IMS) by simulating all the Network and surrounding elements. The lab was used by C-DoT for carrying out BSNL 4G PoC testing. This is an indigenous 4G core solution developed by C-DoT under 'Make in India' initiative of Government of India.

- b) IPv6 Ready Logo Lab: IPv6 Ready logo lab of TEC is one among seven in the world having approval by IPv6 Ready logo committee under IPv6 Ready logo forum. The lab has the capability of conformance and interoperability testing of various equipment implemented IPv6 Stack on their device. The lab also reviews the results of Asia Pacific region assigned by IPv6 Ready logo forum periodically.
- c) Green Passport (GP) Lab: It has facility to carry out Energy Efficiency Testing of various equipment in accordance with the energy consumption rating standards prescribed by TEC.
- d) Security Lab: Security Lab plays crucial role in identifying vulnerabilities, testing defences and enhance overall security. TEC has successfully tested the sample DUT using Vulnerability Assessment tool of NCCS through remote access using 10 MBPS IP MPLS link.
- iii) TEC designated Conformity Assessment Bodies (CABs):
 - a) Till December 2024, a total of 73 labs have been designated by TEC as CABs so far. Details of designated CABs along with scope of designation is available at <https://www.tec.gov.in/Labs-Designated-by-TEC>.
 - b) Scheme for creation of a Resource pool of Mentors for Mentorship Programme of Designated Domestic Conformity Assessment Bodies (CABs) has been launched in December 2024.
- iv) Scheme for Reimbursement of Testing and Certification charges for Start-Ups, MSMEs has been approved.

4.2.4 Certification

- i) Conformance Certification: TEC issues Type Approval Certificate (TAC), Interface Approval Certificate (IAC) and Technology Approval Certificates against relevant standards.
- ii) Type Approval: It is the process of testing and certification of telecom product for conformance with the Standard for Products/Equipment (erstwhile Generic Requirement (GR) of the product) issued by TEC.
- iii) Interface Approval: It is the process of testing and certification of telecom product for conformance with the Standards for Interface (erstwhile Interface Requirement (IR) of the product) issued by TEC. Interface Approval is at times mandated as a compulsory certification by license conditions or Government entities or service providers.

- iv) **Certificate of Approval:** It is normally granted for new and evolving products for which Standards (GR/IR) is not yet formulated. The testing is conducted in accordance with the Test Schedule & Test Procedure (TSTP) approved by TEC, which is prepared based on the product description and technical details provided by the manufacturer.
- v) **Technology Approval:** It is a process of testing and certification of prototype of a telecom product developed by R&D organizations (such as C-DoT), Start-up etc. It involves exhaustive onsite/ witness testing of the EUT against related TEC product standard.
- vi) **Regulatory Certification: Mandatory Testing & Certification**
- vii) **Mandatory Testing and Certification of Telecom Equipment (MTCTE):** With the objective of ensuring safety of the general public & users, secure and efficient functioning of equipment/network, RF emissions from equipment are within safe limits and telecom equipment complies with the relevant national and international regulatory standards & regulations, Government has notified Indian Telegraph (Amendment) Rules, 2017, which inter alia prescribes for mandatory testing and certification of all telecom equipment before its sale, import or use in India. TEC is implementing mandatory testing and certification in accordance to TEC document on “Procedure for Mandatory Testing and Certification of Telecom Equipment” – TEC 93009:2024.
- viii) **Essential Requirements: Technical Regulations in the form of Essential Requirements (Ers),** which are mandatory to be complied under MTCTE framework, has been formulated for various telecom and related IT equipment. Essential requirements (ERs) are modular and comprises of EMI/EMC, Safety, Technical, Security (ITSAR) and Other Requirements like IPv6 etc. Essential Requirements (ERs) are developed through MATCOF (Mandatory Testing Consultation Forum) meetings in which stakeholders such as OEMs, Service Providers, Associations, Testing Labs, Experts and Government organizations participates. TEC has issued 72 ERs so far, covering more than 200 equipment.
- ix) **MTCTE Portal:** For implementation/ administration of MTCTE framework efficiently, an online MTCTE web-portal <https://www.mtcte.tec.gov.in/> has been developed. The whole process of application, test report upload/validation/evaluation and certificate issuance has been made online by bringing in all the stakeholders i.e. applicant, manufacturers, test labs, validators/evaluators and certificate issuer on the same platform.
- x) **MTCTE status:** MTCTE framework has been implemented in five different

phases with their certification enforcement date. Various telecom equipment such as LAN Switch, Router, WiFi Access Point & CPE, BTS, Optical Fibre/Cable, Smart Electricity Meter, PON ONT/OLT etc. are notified* under MTCTE. Phase wise mandatory certification date under MTCTE is given as below:

MTCTE Phase	Notification date	Mandatory Date	ER (products) covered	Product variants covered
I	04.07.2019	01-OCT-2019	6	21
II	23.06.2020	01-OCT-2020	3	6
III	22.09.2021	01-JAN-2024	5	12
		01-JAN-2024	1	6
		01-APR-2024	1	5
		01-AUG-2024	1	1
IV	22.09.2021	01-JAN-2024	27	69
		01-APR-2024	1	6
		01-AUG-2024	7	36
		01-OCT-2024	1	11
V	23.06.2023	01-JUL-2024	3	15
		01-OCT-2024	3	9
Total			59	197

* List of notified products and its variants is available at <https://www.mtcte.tec.gov.in/>.

- xi) MTCTE Certificates issued: Total 984 MTCTE Certificates have been issued from 01.04.2024 to 10.12.2024 covering 3111 equipment models under this framework. Details of the certified equipment under MTCTE is available at <https://mtcte.tec.gov.in/certified equipments>. Further, during the said period, total 58 Indian OEM and 60 Foreign OEM have been registered on the MTCTE Portal.
- xii) MTCTE Appeals: The Section IV of the MTCTE Procedure (TEC 93009:2024) provides the procedure for dealing with appeals received from the Appellant (i.e. OEM / AIR) against any decisions taken by TEC / Appropriate Authority (AA) with respect to their certification application, e.g., refusal to accept an application, refusal to accept test results/ reports, refusal to proceed with evaluations, refusal to grant certification, decisions to close the application or deny certification or any other action imposed/ taken. Appellant may also appeal against AA's decision to put

the certification under abeyance, suspend, or forced withdrawal of certification, or any other action that impedes the attainment of certification. Designated Appeals Committee is responsible for considering the appeal.

- xiii) Voluntary Certification: Development of online modules for Voluntary Certification for Type Approval / Interface Approval: For the implementation / administration of Voluntary Certification efficiently, an online module has been developed on MTCTE web-portal <https://www.mtcte.tec.gov.in/>. The process of application, test report upload/ evaluation and certificate issuance has been made online by bringing in all the stakeholders i.e., applicant, manufacturers, test labs, evaluators and certificate issuer on the same platform.

Advantages of Online module: The online module of Voluntary Certification shall inter alia:

- a) Simplify the process of application registration, tracking and monitoring
- b) Eliminate the risk of losing documents
- c) Provision of a dialogue box for faster communication between the applicant and TEC
- d) Digital Certificate generation
- xiv) TEC offers support to DPIIT-registered startups and registered MSMEs by providing total exemption of testing and certification fees for their products under the Voluntary Testing and Certification scheme. This exemption is valid for a period of 5 years from March 30, 2022.
- xv) Around 35 Voluntary Certificates have been issued since 01-01-2024:
 - a) Type Approval= 16
 - b) Interface Approval=9
 - c) Technology Approval=2
 - d) Approval for CAS/SMS=3

4.2.5 New Initiatives

- i) International Quantum Communication Conclave: The “Second International Quantum Communication Conclave” was organized by TEC on 15th and 16th February, 2024 at Vigyan Bhawan, New Delhi to bring together all the researchers and the industries working in the area of Quantum Technology. The conclave was inaugurated by Dr. Neeraj Mittal, Secretary Telecom and Chairman Digital Communications Commission, in the august presence of Prof. Ajay Kumar Sood, Principal Scientific Adviser to Govt. of India; Dr. Subrata Rakshit, Director General,

Technology Management, DRDO and Smt. Tripti Saxena, Sr. DDG and Head, TEC.



“Second International Quantum Communication Conclave” was organized by TEC on 15th and 16th February, 2024 at Vigyan Bhawan, New Delhi

- ii) A new type of Distress Alarm Terminal was developed by TEC in collaboration with TIH Foundation for IoT and IoE (TIH-IoT) of IIT Bombay. It was an IOT based device and used multimodal communication (LoRA, GSM, Wi-Fi) protocols to send the distress signal from the user to a centralised server. The device also used voice recognition and high-volume sound (as emitted by persons in distress) in addition to other means to automatically detect distress situation and communicate to the centralised government server.

The device also sends the time and location to the centralized monitoring server, allowing the authority to take immediate action. Demonstration of

this Distress Alert System (“ASHA”) was successfully given to many visitors and dignitaries including Hon'ble MoSC during IMC and WTSA-2024.

- iii) Release of Technical Report “Revolutionizing Agriculture: The Digital Transformation of Farming”:

Technical Report on “Revolutionizing Agriculture: The Digital Transformation of Farming” (TEC 31228:2024) was released during the inaugural session of ITU/FAO Workshop on “Cultivating tomorrow: Advancing digital agriculture through IoT and AI” on 18th March 2024 in presence of Member (Services), DoT; Director, TSB, International Telecommunication Union (ITU) and Sr. DDG & Head, TEC and DDG (NRM), ICAR.



ITU/FAO Workshop on “Cultivating tomorrow: Advancing digital agriculture through IoT and AI” on 18th March 2024

- iv) This comprehensive report, a collaborative effort of TEC and ICAR will serve as a good reference for stakeholders across the agricultural sector, guiding decision-makers on harnessing the power of technology to drive sustainability, efficiency, and resilience in food production.



Release of TEC Technical Report on “Revolutionizing Agriculture: The Digital Transformation of Farming” (TEC 31228:2024) during ITU/FAO Workshop on “Cultivating tomorrow: Advancing digital agriculture through IoT and AI” on 18th March 2024

4.2.6 IT Initiatives & New Portals

- i) Dashboard for monitoring of MTCTE: A MTCTE Dashboard has been made operational w.e.f. 21-Oct-2022.
- ii) Conformity Assessment Bodies (CAB) Dash Board for monitoring of CABs: A Dashboard for monitoring of CABs has been developed through C-DoT and made operational w.e.f. 05.11.2024.

4.2.7 Pilot Projects/ Proof of Concept (PoC) Testing

TEC is involved in the Proof of Concept (PoC) testing of various telecom equipment/ systems. Status is as under:

Completed	• PoC Testing of the C-DOT Quantum-safe Video Conference Solution using Post Quantum Cryptography • Indigenous E Band Microwave System of M/s. Astrome
Ongoing	• Indigenous 4G Macro eNodeB of M/s. Lekha Wireless • Indigenous 4G LTE eNodeB of M/s. Resonous • Indigenous 4G LTE eNodeB of M/s. Signaltron

4.2.8 TEC@Enabler

TEC is enabling growth of telecom eco-system, domestic manufacturing in multifarious ways:

- i) Enabling AtmaNirbhar Bharat
 - a) Test trials/ Proof of Concept testing of indigenous products/ technologies
 - BSNL's indigenous 4G Proof of Concept (POC) evaluation
 - TEC conducting/ anchoring Proof of Concept (PoC) testing/ evaluation for:
 - o Indigenous 4G LTE eNodeB of M/s. Resonous
 - o Indigenous 4G LTE eNodeB of M/s. Signaltron
 - o Indigenous E Band Microwave System of M/s. Astrome
 - b) Technology Approvals/ Certificate of Approval (CoA) to indigenous developed technologies/ products
 - Type approval for Quantum Key Distribution System given to M/s QuNu Labs.
 - Technology Approval for eNodeB (Band 8), C-DoT is completed by Mobile Technologies Division.
 - Certificate of Approval for ABot Test Automation and Analysis Tool for 5G N1/N2/N3 Interfaces by Rebaca is completed by Mobile Technologies Division.
 - Technology Approval for eNodeB (Band 3), C-DoT is ongoing
 - Technology Approval for eNodeB (Band 1), C-DoT is ongoing
 - Certificate of Approval for FSOC product by M/s Nav Wireless Technologies Pvt. Ltd, Ahmedabad, Gujarat
 - Certificate of Approval for SNAP-Mobile App by M/s M/s Aprecomm Private Limited, Bangalore
 - Certificate of Approval for Virtual Wireless Expert (VWE) by M/s Aprecomm Private Limited, Bangalore
 - Certificate of Approval for Vyom Configuration Server (VCS) by M/s Aprecomm Private Limited, Bangalore
 - Certificate of Approval for ABot-5G Test & Automation Tool by M/s Rebaca Technologies Private Limited, Kolkata
 - Technology approval for Converged Gateway Node developed by C-DoT
 - Technology approval for eNodeB developed by C-DoT
 - C-DoT CAS/SMS

- c) TEC Standards for compliance of notified products under Preference in Public Procurement – Make in India (PPP-MII) Policy of Dept. Of Telecommunications
- d) AtmaNirbhar in Safety & EMI/EMC testing. Further working towards making India AtmaNirbhar in other domains of telecom testing infrastructure
- ii) Enabling Start-ups, MSMEs & Innovators
 - Knowledge sharing of standards/ regulations
 - Handholding for testing of design/ proto-types & certification
 - Enabling participation in standard development process
 - Enabling membership of ITU National Working Groups (NWGs) thereby participation in international standardization activities
- iii) Enabling promotion/ deployment of Emerging Technologies
 - a) 5G:
 - Standard for Generic Requirements (GR) on Small Size 5G Core (TEC 21120:2024)
 - Standard for Generic Requirements (GR) on Small Size gNodeB (TEC 21100:2024)
 - Test Guide on 5G Core (TEC 22161:2024)
 - Essential Requirements for Cellular Customer Premises Equipment (TEC40012408)
 - Essential Requirements (ER) of 5G Core (TEC40182401)
 - Essential Requirements (ER) of SIM (Review & Revision and addition of 5G SIM) (TEC40162409)
 - Revision of Essential Requirements (ER) of Base Station for cellular network for 5G(TEC42732410)
 - For enhancement of the testing capabilities in the country specially in field of 5G products (5G Core, 5G BTS etc.) and some emerging technologies like Hypervisor, Hybrid Set Top Box, IP terminal etc., TEC vide letter dated 13.02.2023 has announced that TEC will grant Provisional Designation to Domestic Labs in respect of following products: -
 - o Base Station for Cellular Networks- 5G variants
 - o 5G Core
 - o Hypervisor
 - o Converged Multi Service Application Access Equipment (CMSAAE)

- o IP terminal
- o Hybrid Set Top Box

This Provisional Designation will enable labs to acquire customers for testing of products and in building confidence regarding testing capabilities. However, such Provisionally Designated Labs will not be able to issue test reports to the customer till successful NABL Accreditation for concerned scope and Provisional CAB designation is not regularized by TEC.

- To facilitate the labs for the development/enhancement of testing capability/capacity in country for telecom sector, especially in field of 5G Products (5G Core, 5G BTS etc.), TEC vide letter no. 4-18/2023-CA/TEC dated 31.03.2023 has notified that “The Labs seeking designation in field of 5G Products (5G Core, 5G BTS etc.) are exempted from submission of payment of application fee for CAB Designation for a period of one year from the date of issue of this letter
- b) 6G: TEC is playing an active role for the development of 6G technologies eco-system in collaboration with industry, startups, R&D institutions, academia, etc. The works include:
 - TEC organized workshop on “THz Communication” featuring esteemed experts from industry, academia and government organizations was held on 28th June, 2024. Engaging discussions took place on topics such as Introduction to THz frequency bands, implementation technology and challenges, 6G THz Communication Link- Antennas, Intelligent Reflecting Surfaces, Terahertz Wireless Communications Over Fading Channels with Pointing Errors, Mm-wave and THz imaging etc.
 - TEC through its efforts in chairing and coordinating National Study Group-5 corresponding to Study Group-5 of ITU-R submitted India specific contributions on 6G framework under development at ITU-R. India’s inputs on Ubiquitous Connectivity as a usage scenario and Coverage, Interoperability and Sustainability as Capabilities were accepted in the ITU-R IMT-2030 (6G) framework document. Enormous coordination efforts were undertaken to make this a possibility at both NSG-5 level as well as in ITU-R meetings.
 - Engaging with academic/ R&D institutions, startups and industries to familiarize with the research and development works and to synergize the efforts of various stakeholders for pre-standardization activities.
 - Participation in 6G pre-standardization activity at national and international work groups (3GPP, ITU, SCF, BF etc.) for presenting India

centric requirement and contribution in the 6G Task Force for the development of 6G vision statement.

- Co-ordination, interaction and policy inputs to various organisations on the
 - o Spectrum, standardisation, validation
 - o Indigenisation and development of 6G ecosystem
 - o Use case development, deployment studies.
- c) IoT:
 - Policy inputs viz. 13-digit numbering scheme, Embedded SIM & remote subscription management
 - Technical Reports on IoT/M2M technology – Architecture, Communication technologies, Spectrum, Numbering resources, EMF Radiation from M2M/ IoT devices etc.
 - Technical Reports on IoT/M2M Security - embedded SIM, Code of Practice for securing consumer IoT, Framework of National Trust Centre for M2M/IoT Devices and Applications, Security by Design principles for IoT device manufacturers
 - Technical Reports on use cases of IoT/M2M – Smart Cities (Strategies, Design & Planning aspects & Standards), Intelligent Transport System (Technologies & Standards), Smart Agriculture, Smart Village, Power, Remote Health, Safety & Surveillance etc.
 - ERs of smart devices such as IoT gateway, Feedback device, Tracking device, Smart Electricity Meter, End Point Device for Environmental Monitoring
 - Adoption of oneM2M Release 3 and 2 specifications as National Standards- These specifications will enable the development of standardized IoT ecosystem in the country including smart cities.
 - Adoption of TSDSI Transposed 3GPP Standards as National Standards:
 - o 1546 (Release 13 to 17) TSDSI 3GPP Standards documents Adopted by TEC as National Standards.
 - o 408 (Release 13 to 17) TSDSI 3GPP Standards documents Adopted by TEC as National Standards.
 - o 2579 (Release 15 to 17) TSDSI 3GPP Standards documents Adopted by TEC as National Standards.
 - International recognition of TEC Technical Reports in IoT domain: International Telecommunication Union (ITU) has posted the following

seven TEC Technical Reports on its website (<https://www.itu.int/cities/dt-resource-hub/iot/>) in IoT sections (2024, 2023, 2022 and 2021), recognizing as insightful technical resource for the benefit of global community-

- o Revolutionizing Agriculture: The Digital Transformation of Farming
- o Security by design for IoT Device Manufacturers
- o Framework of National Trust Centre for M2M/IoT Devices and Applications
- o IoT/ ICT Standards for Smart Cities
- o Emerging Communication Technologies & Use Cases in IoT Domain
- o Code of Practice for Securing Consumer Internet of Things (IoT)
- o IoT/ ICT Enablement in Smart Village and Agriculture

Total 22 technical Reports have been released so far. All the Technical Reports are available on TEC website <https://tec.gov.in/M2M-IoT-technical-reports>.

- d) Quantum Technology: TEC is playing an active role for the development of Quantum technologies eco-system in collaboration with industry, startups, R&D institutions, academia, etc. The works include:
- Release of Standards for Generic Requirements for “Quantum Key Distribution System” and Quantum-Safe and Classical Cryptographic Systems”.
 - International Quantum Communication Conclave with participation from academia, R&D institutions, startups, industries and service providers
 - Participation in Quantum Technology standardization activity at national and international work groups (ITU, IEEE, etc.) for presenting India centric requirement
 - Engaging with academic/ R&D institutions, startups and industries to familiarize with the research and development works and promote the technology developed by assisting in getting proof of concept and test/ trials done.

4.2.9 Engagement with International Standardization Activities

- i) ITU-T National Working Groups (NWGs): TEC is responsible for administration and coordination of National Working Groups (NWGs) constituted in India corresponding to ITU-T Study Groups.

- ii) ITU-T Study Group 2 - Operational aspects of service provision and telecommunications management
- iii) ITU-T Study Group 3 - Tariff and accounting principles including related telecommunication economic and policy issues
- iv) ITU-T Study Group 5 - EMF, Environment, Climate Action, Sustainable
- v) ITU-T Study Group 9 - "Audio visual content transmission and integrated broadband cable networks" or "Broadband Cable and TV"
- vi) ITU T Study Group 11: Signaling requirements, protocols, test specifications and combating counterfeit telecommunication/ ICT devices
- vii) ITU-T Study Group 12: Performance, quality of service (QoS) and quality of experience (QoE)
- viii) ITU T Study Group 13: Future networks and emerging network technologies (& cloud)
- ix) ITU-T Study Group 15: Networks, technologies and infrastructures for transport, access and home
- x) ITU T Study Group 16: "Multimedia and related Digital Technologies"
- xi) ITU T Study Group 17: Security
- xii) ITU T Study Group 20: Internet of Things (IoT), Digital Twin and Smart Sustainable Cities and Communities
- xiii) Participation in ITU-R Activities - ITU-R Study Group 5: Terrestrial services:

In addition to National Working Groups, corresponding to all 11 study Groups of ITU-T, TEC is also responsible for coordination and administration of National Study Group (NSG)- 5 corresponding to ITU-R Study Group (SG)-5. ITU-T SG-5 is responsible for studies related to Systems and networks for fixed, mobile, radio-determination, amateur and amateur satellite services. Further, ITU-R SG-5 has four Working Parties: 5A, 5B, 5C and 5D.

- xiv) In addition to the ITU-T Study Groups, TEC has constituted "National Working Group on Open RAN (NWG- ORAN)" to have a focused and coordinated approach for development of standards on Open RAN and contributing to International standardization bodies, taking into account country specific needs. The NWG-Open RAN is comprised of experts from industry/startups, R&D organizations, academia, service providers, Govt. Organizations, MSMEs, etc. working in the area of Open RAN.
- xv) The TS Division involve in the standardization activities by contributing to SG-17 of ITU. DDG (TS) Chairs the National Working Group-17

corresponding to ITU-T Study Group-17 (SG-17) and provides inputs to SG-17 on Security.

- xvi) TS Division also involved in the contributing inputs to APT, 3GPP, ETSI and other standardisation bodies in the fields of security.

4.2.10 Major Achievement at International level (in ITU-T, ITU-R, Etc.)

- i) Contributions submitted by TEC in the Indian Work Item ITU-T Y.RemoteEd: "Requirements, capabilities and deployment models for e-learning in remote classrooms" have been agreed in ITU-T SG-20 meeting, July 2024 for final publication with number ITU-T Y.4234.
- ii) TEC made significant contributions from India to the following WTSA Resolutions during five APT preparatory meetings, which were finalized in the 5th meeting of the APT Preparatory Group for WTSA-24, held from August 19-23, 2024:
- iii) WTSA Resolution 98 (Enhancing the standardization of Internet of Things and smart cities and communities for global development)
- iv) WTSA Resolution 65 (Calling party number delivery, calling line identification, and origin identification information)
- v) In this context, India's contribution in WTSA Resolution 98, Resolution 65, and a new resolution on the metaverse "Promoting and Strengthening Metaverse Standardization" were presented and discussed extensively in various Ad Hoc Group and Drafting Group meetings during the ITU WTSA-2024 event held in New Delhi from October 14-24, 2024. The APT region's proposals, including contributions from India, were accepted with minor modifications.
- vi) India along with likeminded countries established a new Focus Group on AI Native Networks (FG-AINN) under ITU-T Study Group 13 in July 2024. FG-AINN aims at exploring and defining the fundamental changes needed in network architecture to fully harness the potential of AI. This focus group seeks to identify the requirements, challenges, and opportunities that AI-native networks will bring to the global communications landscape. AI-native network is expected to play a key emerging technology in IMT-2030
- vii) The new resolution on Promoting implementation of and migration to post-quantum cryptography is approved as an action point in WTSA24.
- viii) National Working Group on Quantum Technologies (NWG-QT) has submitted 4 contributions in ITU-T SG13 and 5 contributions in ITU-T Sg17.
- ix) ITU-T Study Group-9: India has taken up two contributions related to

Conditional Access Systems (CAS) at ITU-T level in Q2/9 and was successful in release of one ITU Recommendation and one ITU Technical Report, both related to the work on Conditional Access Systems (CAS) done by TRAI and C&B Division, TEC.

- x) Recommendation ITU-T J.1036 'Factual subscriber-base reporting and protected content delivery in conditional access system – Requirements'
- xi) ITU-T Technical report TR.FSR 'Factual subscriber-base reporting and protected content delivery in a conditional access system (CAS).'
- xii) Participation in other International Standardization Bodies such as Asia Pacific Tele-community (APT), International Electro-technical Commission (IEC), IEEE, IETF, ETSI, 3GPP, OneM2M etc. in the areas of interest.
- xiii) Continuous engagement with ITU-R Working Party 5D with contributions related to sharing and co-existence studies for identification of different bands for IMT.
- xiv) TEC has chaired the Adhoc group (AHG) set up for Resolution 40 on 'Regulatory and Policy aspects of the work of the ITU Telecommunication Standardization Sector' during WTSA-2024 event held at Delhi to discuss and harmonize the proposals from proponent member nations. The draft prepared by the AHG on Res.40 was approved by the WTSA-2024 plenary. All these resolutions have been finalized in WTSA-2024 plenary.

4.2.11 Important Activities During the Year

- i) Participation in APT-WTSA preparatory meetings held throughout the year till WTSA-2024. Lead and co-lead in various APT common proposals for WTSA-24.
- ii) Participation in WTSA-2024 and presenting the APT common proposals in WTSA meeting sessions where the proposal was lead/co-lead by India and also tracked the developments in other important WTSA resolutions. Participated in various bilateral engagements during WTSA-2024.
- iii) Officers from TEC selected as Vice Chair for different Study Groups of ITU-T during WTSA-2024.
- iv) Hosting of ITU-T Study Group-9 Meeting in India: Telecommunication Engineering Centre (TEC) in association with the Indian Institute of Science (IISc), Bengaluru successfully hosted the meeting of the Study Group 9 (SG-9) "Broadband Cable and Television/Audiovisual content transmission and integrated broadband cable networks" was held during 09-18 May, 2023 in India at the IISc, Bangalore.
- v) TEC successfully hosted ITU/ FAO Workshop on "Cultivating tomorrow:

Advancing digital agriculture through IoT and AI" and 9th Meeting of ITU/FAO Focus Group on 'Artificial Intelligence (AI) and Internet of Things (IoT) for Digital Agriculture' (FG-AI4A) in New Delhi jointly with ICAR on 18-19 March 2024, with participation of more than 250 delegates globally.



Field visit to the IoT and sensor operated Greenhouse Vertical Farm, Plant Phenomics Centre and Internet of Drones demonstration during this two-days event provided invaluable insights into the innovative technologies shaping the future of agriculture. From witnessing vertical farming techniques maximizing space efficiency to experiencing the transformative potential of drone technology in crop monitoring and management, delegates gained a deeper understanding of how these advancements can revolutionize farming practices.

vi) **TEC Stall in India Mobile Congress (IMC) & WTSA, 2024:**

TEC stall was organized during India Mobile Congress (IMC), WTSA 2024, held from 14th October 2024 to 24th October, 2024 at Bharat Mandapam, New Delhi. Several high dignitaries and experts visited the TEC stall during the period of IMC and WTSA. During the event, following activities were demonstrated:

- a) **Non-Intrusive Market Surveillance:** NIMS system has been envisaged in Telecom networks to handle rouge and un-certified products/equipment which are added to the network as per the requirements of conformity assessment framework. The capability of Non-Intrusive Market Surveillance Concept was demonstrated during IMC & WTSA 2024.
- b) **ASHA (Anytime Smart Help Anywhere):** ASHA aimed to develop the Proof-of-Concept towards an IoT-based safeguard device, featuring multimodal communication (LoRA, GSM, Wi-Fi) protocols, that can send the distress information of the user, along with the time and location to the centralized monitoring setup, allowing the authority to take immediate action. The

distress condition of the user is captured by the switch press or high-volume voice message and an alert signal is communicated. The capability of ASHA concept was demonstrated during IMC & WTSA 2024.



Member(Services), DCC, DoT visited TEC stall

- vii) Further, the lectures/talk were delivered on Digital Wave stage in WTSA,2024 on following topics:
- Non-Intrusive Market Surveillance
 - ASHA (Anytime Smart Help Anywhere)
 - Test as A Service (TAAS)



DDG (CA), TEC delivering the lecture on TaaS during IMC & WTSA ,2024]

- d) Three resolutions 29, 61 and 93 were presented by NWG-2 Chair i.e. DDG(RC) in WTSA 2024 and the APT common proposal were largely agreed by WTSA and incorporated in final WTSA resolutions.

- e) Activities of National Enquiry Point for WTO –TBT (Technical Barrier to Trade) Agreement
- f) Implementation of Public Procurement, Preference to Make in India (PPP-MII) policy of DoT
- g) First meeting of ITU-T Study Group 20 Regional Group for Asia-Pacific (SG20RG-AP)
- h) Examination of Special Chemicals, Organisms, Materials, Equipment and Technologies (SCOMET) cases
- i) Technical Examination of CMRTS/ PMRTS license cases
- j) Issues related to HS Codes for Telecom Products: Input provided to DoT HQ as and when required.
- k) Reply to Customs related Queries.
- l) Identification of Critical Telecom Infrastructure.
- m) Inputs to DoT for Policies related to Renewable Energy.
- n) PLI Policy: In respect of implementation of PLI Policy, a Technical Committee under Chairmanship of Sr. DDG TEC has been constituted by DoT HQ. Necessary Coordination on behalf of TEC is provided.

4.2.12 Knowledge Sharing Events/Activities

- i) TEC organized the workshop on “Open Radio Access Network (O-RAN)” in hybrid mode featuring esteemed speakers and experts from industry, academia and government organizations on 29th April, 2024. Engaging discussions took place on topics such as the Radio Access Network - building blocks, layer-wise functions, protocols, RAN Evolution - Legacy RAN, vRAN, cRAN and O-RAN - architecture, interfaces, standardization etc.
- ii) Study Paper on - “Architecture overview for evolved NGN Control Plane” released on 12th January 2024. The evolved NGN (Next Generation Network) control plane integrates advanced technologies to enhance flexibility, scalability, and efficiency in managing modern telecommunications networks. It adopts a layered architecture comprising service, control, and transport planes, facilitating seamless interaction between user applications and underlying network resources.
- iii) Study paper on - “Reflecting/ Reconfigurable Intelligent Surface for 6G Systems” (RIS) released on 16th July 2024. The scope of this document is to explore Reconfigurable Intelligent Surfaces (RIS) for 6G communication systems. It covers how RIS works, its design, and how it can be used in different areas like high-frequency communications, mobile networks,

- drone networks, secure communications, and advanced signal techniques. The document also looks at the challenges and future research areas, such as improving signal detection, optimizing network performance, and managing RIS configurations.
- iv) Study paper on – “Integrated Sensing and Communication Networks - Towards 6G” (ISAC) released on 16th July 2024. The Radio Communication Division of the International Telecommunication Union (ITU-R) has recently included Integrated Sensing and Communication (ISAC) as one of the key usage scenarios for IMT-2030/6G. ISAC is expected to play a vital role in the upcoming wireless generation standards. This paper explores the important aspects of ISAC, starting with an introduction, discusses the development trajectory of ISAC highlighting its benefits and implementation of ISAC in 6G.
 - v) QT Division, TEC organized a webinar on Cyber security solutions for "Ransomware Mitigation, Online-examination and secure vault" on 25 September, 2024.
 - vi) QT Division, TEC organized seminars on Quantum Cryptography for 5G networks “Advances in Quantum cryptography” and “Quantum secure 5G and ORAN”.
 - vii) Telecommunication Engineering Centre (TEC), in collaboration with C-DoT and TSDSI, conducted the “National Workshop on Enhancing Indian Participation in Telecom Global Standards Bodies” on 7th July 2023 at the C-DoT Campus. The organizing committee for this event was chaired by the Deputy Director General (RC). During the workshop the following activities took place
 - viii) TEC organised awareness workshops on ‘National Trust Centre (NTC) for IoT/ M2M devices & applications’ on 12.01.2024 in New Delhi and on 15.05.2024 in Bengaluru to deliberate with IoT/M2M device manufacturers, Application Service providers, M2MSPs and other concerned stakeholders on various aspects of development and implementation of NTC.
 - ix) Online Module for Voluntary Certification of telecom products was introduced
 - x) Standards Coordination Portal, to serve as a central hub for sharing information and promoting collaboration in Standardization in telecom and related ICT domains was launched
 - xi) TEC standard on Fairness Assessment and Rating of Artificial Intelligence Systems was unveiled

- xii) Approval Certificate for Conditional Access System and the Technology Approval Certificate for Dual Band Outdoor Wi-Fi Access Point, was handed over to C-DoT, symbolizing their commitment to quality and innovation.
- xiii) TEC organized a workshop on 'Technological Advancements in Battery Cell Technology' for battery sets used in Telecom applications during the year. The workshop focuses on innovations and opportunities in the power backup solutions in the Telecommunication network. Topics like Advancement in Telecomm Power backup solutions, Way forward in Li-Ion Battery Technology, Best practices for manufacturing Lithium-Ion batteries, future of energy Storage and the vital role of advance chemistry battery cell solutions and circular economy initiatives in Battery ecosystem were covered during the workshop.
- xiv) The event provided a platform to raise awareness and encourage active Indian participation in international standardization bodies such as ITU, 3GPP, IEEE etc. The workshop emphasized the pivotal role of standardization for businesses and start-ups, particularly through the Standard Essential Patents (SEP) mechanism.
- xv) Study Paper on - "Optical Fibre Submarine Cable Systems: Overview and Technological Advancements" released during this year. This study paper delves at the significant technological advances in optical fibre submarine cable systems that have revolutionized worldwide telecommunications and internet connectivity. It highlights the challenges faced by early systems, such as signal degradation, limited bandwidth, and vulnerability to damage, and emphasizes the need for continuous advancements in technology. It also highlights the global best practices in submarine cable systems and suggests future roadmap to ensure long-term liability.
- xvi) Study paper on - "Distributed Fibre Optic Sensing Technology" (DFOS) released on 30th sept 2024. This study paper encompasses the use cases of DFOS technology, particularly in Telecommunication Network Monitoring, Structural Health Monitoring, Geotechnical Engineering, Railway Monitoring, and Seismic and Vibration Sensing. This paper also highlights the latest progress in DFOS technology in India and the World.
- xvii) TEC organized an interactive session on 'Global standardization on IoT and Telecom' by Dr. Philipp Schulte, CEO G+D Mobile Security - Global, on 10th September 2024. TEC organized a Webinar on Framework for Fairness Certification of Artificial Intelligence Systems.
- xviii) TEC released a Study Paper on 'Metaverse', which covered the concept of

Metaverse, its technologies, architecture, potential applications, case studies, Metaverse for SDGs, standardization aspects, serviceable opportunities in India, challenges & concerns, initiatives and policies & regulations at the global level.

- xix) TEC organized a Webinar on “Security of 5G Infrastructure” on 16.10.23, which was attended by officers of TEC, DoT and LSA units. The session was delivered by experts from Industry and NCCS.

4.2.13 Regional Telecommunication Engineering Centre (RTEC)

Regional TECs are front offices of TEC at field locations, carrying out multi-faceted activities. RTECs are primarily responsible for on-site/ witness testing of equipment/ services for Type Approval Certificate, Interface Approval Certificate, Certificate of Approval, Technology Approval, Proof-of Concept Testing, field trials etc. After notifications of MTCTE framework, the role and responsibility of RTECs have grown multi-folds and evaluation of test results for MTCTE certification is also assigned to RTECs. In addition, RTECs plays a key role in site visits of testing laboratories for assessing quality system, infrastructure and technical competency to designate them as TEC designated CABs. RTECs also undertakes various activities for promotion of standardization in the sector.

4.3 Director General Telecom (DGT)

The office of Director General of Telecommunications (DGT) is an attached office of the Department of Telecommunications (DoT) and is headed by an Apex level officer. Director General Telecommunications (DGT) is head of 37 DoT Field Units in all the 22 Licensed Service Areas located across all over the country. Headquarters of Director General Telecommunications (DGT-HQ) is located in New Delhi.

The DGT-HQ monitors the work performed by 22 LSAs headed by HAG+/HAG Level offices. It is also mandated to undertake

- i) Administrative and Establishment inspection of LSA offices.
- ii) Conducting regional and All India meeting for review and functioning of LSAs.
- iii) Implementation and monitoring of various licensing conditions of all licenses issued by DoT.
- iv) Maintenance of TARANGSANCHAR Portal to provide Electromagnetic Radiation (EMR) Information for general Public.
- v) Giving telecom policy related Inputs to AS/CS/DS wing of DoT.
- vi) Development, Implementation, operationalization and monitoring of

different projects/schemes approved by DoT e.g. Telecom Analysis and Fraud Management and Consumer Protection (TAFMCP), Project for graphical visualization of Pan-India mobile coverage – RF Coverage portal, PM Wi-Fi Access Network Interface (PM-WANI), AI and Facial Recognition powered Solution for Telecom SIM Subscriber Verification (ASTR), Central Equipment Identity Register (CEIR) to curtail counterfeit mobile phone market.

vii) Ensuring Powering of telecom towers with renewable energy.

The LSA officers represent the licensing/telegraph authority in the field. The LSA field units play an important role as an interface between the State Government and DoT for activities such as Right of Way issues, Smart City coordination, IPv6 implementation, improving the coverage in uncovered areas, etc. The LSA field units' also function as an interface between Law Enforcement Agencies and the TSPs in the matters related to National Security. In addition to the above, the LSA field units play a crucial role in implementation of time synchronization across the telecom network, inspection of USOF funded sites, National Broadband Mission to provide each and every household with broadband connectivity, using telecom analytics for protecting consumers from Cyber Frauds, etc.

The tasks performed by various verticals are as under:

4.3.1 Licensing Compliance Vertical

i) Monitoring of compliance to prescribed norms regarding acquisition of subscribers:

As per license terms & conditions, the Licensees are required to ensure adequate verification of each and every mobile customer before enrolling him as a subscriber. The LSAs conduct the CAF audit on sample basis.

LSAs have audited 78.10 lakh of CAFs from 01.04.2024 till 30.09.2024 across all TSPs.

ii) Checking of compliance to Electro Magnetic Field (EMF) radiation norms:

LSAs verify the prescribed EMF self-certificates submitted by TSPs and also check the EMF radiation exposure levels of up to 5 % of Base Transceiver Station (BTS) annually on random basis. In case of non-compliance of EMF radiation norms by TSPs, penalty on the concerned TSP(s) is levied by LSAs.

LSAs have audited 47,412 BTSs from 01.04.2024 till 31.10.2024 across all TSPs.

iii) Dissemination of the information to the public regarding EMF radiation:

Tarang Sanchar portal is a web portal to disseminate the information to the public regarding EMF radiation and to allay the misconceptions and fear of health issues due to EMF emissions from mobile towers. It has the details of Telecom Towers with BTSs spread across the country catering to various technologies (2G, 3G and 4G) of all TSPs licensed by DoT. Through the portal, any person can request for EMF emission measurement at a location by paying a nominal fee of Rs 4000/- online.

During the period from 01.04.2024 till 30.09.2024, a total of 31 EMF Measurement requests have been received by LSAs through Tarang Sanchar Portal. The tests are conducted by the local field unit of DoT and the test report is provided to the requestor.

iv) Service testing for checking Roll-out obligations:

As per the license agreement all the Access Service Licensees are required to rollout their services within prescribed time periods and offer Districts/Blocks/Towns on sample basis for test of the quality/ coverage and other parameters by DoT which is termed as Service Testing.

LSAs have carried out service testing to check Roll-out obligations as per respective NIAs for various technologies including 5G across TSPs. Total of 27 test certificates were issued by LSAs in compliance of roll out obligations during 01.04.2024 to 31.10.2024 across all TSPs.

v) Monitoring of QoS:

LSAs have been mandated to conduct drive test to monitor QoS biannually i.e., one drive test from April to September and another drive test from October to March in all the cities where the field offices are located. Based on the drive test carried out by LSAs, LSAs identify problematic spots/routes; take follow-up action with TSPs for optimization and improvement of networks on these spots/routes.

LSAs have conducted 29 drive tests in cities to monitor QoS for period from 01.04.2024 to 30.09.2024 across all TSPs.

4.3.2 Security Vertical

i) Lawful Interception and National Security

- a) Centralized Monitoring System (CMS) has been implemented to facilitate Ministry of Home Affairs, Central and State Law Enforcement Agencies (LEAs) for automated Law-full interception and monitoring process. All the TSPs' Networks & LEAs are connected through 21 Regional Monitoring Centres (RMCs) on MPLS network of BSNL. This system is operational on PAN India Basis and majority of the LEAs have on boarded

CMS. Currently voice calls, SMS and mobile data are being intercepted through CMS. A new “Auto forwarding” feature in CMS has been deployed to ensure timely approval of interception of targets. Further, a “Trouble ticketing” module has also been developed for raising CMS issues being faced by LEA/LSA.

Licensed Service Area (LSA) field units of DoT are carrying out 24x7 Operations in close co-ordination with Law Enforcement Agencies (LEAs) and Corrective and preventive Maintenance of CMS Network.

- b) Internet Monitoring System (IMS) has been implemented to facilitate Ministry of Home Affairs, Central and State Law Enforcement Agencies (LEAs) for monitoring and surveillance of Internet.

This system is operational on PAN India Basis. As on 31-10-2024, 168 Nos. of IMS nodes are operational on internet Gateways of ISPs.

LSA field units coordinates 24x7 corrective and preventive Maintenance of IMS Network in close co-ordination with TSP/ISP and C-DOT.

- ii) Unearthing of illegal Telecom Networks

Using illegal setups, fraudsters bypass the legitimate licensed International Long Distance Operators’ Gateways and route international calls (Voice Over Internet Protocol - VoIP) coming through the internet directly to domestic Mobile /wireline customers across India. The Calling Line Identification (CLI) of the international VoIP calls is changed with domestic CLI, which is displayed to the called party, who receives it considering it as a domestic call. As a consequence, there is financial Loss to the TSPs & Government Exchequer and more importantly it poses severe threat to the National Security.

Licensed Service Area (LSA) field units of DoT carry out investigation to curb illegal Telecom operations and unearth illegal telecom setups based on the intelligence received from LEAs, TSPs, Report Incoming International Call with Indian Number (RICWIN) (<https://sancharsaathi.gov.in>) and DoT Call Centre (1800110420 or 1963).

Subsequent to analysis of CDRs, IMEIs and recce of suspected premises, raids are done by LSA field units with the help of Local police. TSPs/LSA field units file FIR against the culprits, issue notices indicating violation of conditions of various Acts and follow up the case with LEAs and attend the court proceedings.

In last 11 years, 285 Nos. of illegal setups have been un-earthed by LSA field units.

Calendar Year	No. of illegal setups detected
2014	4
2015	8
2016	8
2017	26
2018	17
2019	17
2020	16
2021	36
2022	52
2023	82
2024 Upto 31st Oct	19
Total	285

iii) Security Audit of TSPs and ISPs

LSA field units carry out the Cross check Network Security Audit of TSPs/ISPs for security compliance of various security norms prescribed in Indian Telegraph Act and License Agreement. During FY 2023-24, LSAs have carried out 298 Crosscheck Security Audits.

iv) National Cyber Crime Reporting Portal (NCRP) and Cyber Police Portal (CPP) – I4C, MHA

Indian Cybercrime Co-ordination Centre (I4C) of MHA has developed a portal - National Cyber Crime Reporting Portal (NCRP - URL - <https://cybercrime.gov.in/>), for reporting financial/cyber frauds. Apart from portal, there are State/UT wise Call Centres (1930) for reporting the Cybercrimes by Citizens. For taking action against reported mobile Nos. involved in financial/cyber frauds, a Cyber Police Portal (CPP) with online workflow has been developed to ensure prompt disconnections and make the entire process efficient and accountable. As per the SOP of I4C portal (CPPP), the LEAs investigate the suspected nos. reported on NCRP/Call Centres and upload on CPP portal and send the list directly to concerned TSPs' account, who disconnect the mobile number, update the status on portal and also take action against to Point of Sale (POS). The entire process is monitored /followed up by the concerned LSA field units, who in addition also analyse the suspected numbers and ensure that needful is done by TSPs/LEAs to curb such activities.

The Cyber Police Portal (CPP) with online workflow is operational since 31.03.2023. The account of all the stakeholders have already been created on the portal. There is also provision of raising the grievance and its redressal mechanism. More than 6.5 Lakh mobile connections involved in Cyber frauds have been blocked since then. This helps in preventing further proliferation of the crime using these resources.

v) URL Blocking

Government of India issues instructions to ban web sites, URLs and APPs which pose threat to the national security. A centralized Online Content Blocking Management System (OCBMS) application for managing workflow of URL blocking/un-blocking has been developed and an SOP has also been issued vide letter dated 10.08.2023. The application provides customized interface for workflow management by all stakeholders viz. DoT HQ, Meity, LSAs, ISPs.

vi) Cyber Security Drive in DoT

To improve the Cyber Security posture of Information system, cyber security drive is being undertaken twice in a year. Up to Sep 2024, over 1700 End user devices have been hardened in various DoT field offices using internal resources.

4.3.3 Technology Vertical

i) M2M Registrations:

Guidelines for M2M Registration have been issued in Feb, 2022 in order to address concerns like interface issues with TSP, KYC, security and encryption. Registrations for M2M services are done by LSAs. 2635 M2M registration certificates have been issued by LSAs from 01.04.2024 to 20.11.2024.

ii) Delegation of signing of ISP license agreement:

In July 2020, DoT delegated the signing of Unified License Agreement (UL) and Unified License (Virtual Network Operator) (UL VNO) agreement for ISP Authorization at field offices of DOT i.e. LSA office. This is an important step towards ease of doing business and decentralization for good governance. It has resulted in cost cutting and saving of time for ISPs during license signing process. 100 UL and 85 UL(VNO) ISP licenses have been signed from 01.04.2024 to 20.11.2024.

iii) Disaster Management:

As per SOP-2020 for telecommunication services for Responding to Disasters, Disaster related activities at State/Telecom Circle level will be coordinated and monitored by State Telecom Disaster Co-ordination

Committee (STDCC). DDG (Technology) in LSA is the Chairperson of STDCC. STDCC meetings are being conducted regularly. More than 30 STDCC meetings have been conducted by LSAs from 01.04.2024 to 20.11.2024.

There were many unfortunate disasters during the period eg. Dana cyclone, flashfloods and landslides in Meghalaya, floods in Andhra Pradesh and Telangana, Remal cyclone etc. Concerned LSAs played a key role in monitoring/coordination for augmentation/restoration of telecom connectivity during these disasters.

iv) Inspections of licensees:

LSAs carry out inspections of Access service Licensees/NLDOs/ILDOs/ISPs/IP-1s etc. for checking compliance to terms and conditions of license agreement/ registrations. Inspection of more than 370 Licensees/IP-1 registration holders were done during the period from 01.04.2024 to 20.11.2024.

v) Prime Minister's Wi-Fi Access Network Interface (PM-WANI):

Prime Minister's Wi-Fi Access Network Interface (PM-WANI) was launched in Dec 2020 for proliferating broadband across the Country through Public Wi-Fi networks. For creating awareness and proliferation of PM-WANI. 24 PM-WANI registration applications (6 App Provider and 18 PDOA) have been approved by LSAs from 01.04.2024 till 20.11.2024.

vi) Experience Sharing and Capacity Building Conference on Disaster Management:

One day conference on 28.08.2024 in New Delhi was jointly organized by DoT Headquarters, DG (T) and NTIPRIT, with the participation of expert speakers from NDMA, NIDM, NTIPRIT, DoT HQ, and C-DOT. DDG Technology of all LSAs attended the conference. Focus of the conference was regarding preparedness and response strategies for telecom networks in the event of cyclones, floods, landslides, forest fires, tsunamis, and other disasters or emergencies.

vii) World Telecommunication Standardization Assembly (WTSA 2024) Outreach sessions and 5G/6G hackathons:

WTSA 2024 outreach and 5G/6G hackathons were organized at DTU Delhi, IISc Bangalore and IIIT Hyderabad on 26-27 Sep 2024. Concerned LSAs played key role in ensuring smooth conduct and success of the outreach sessions and hackathons by coordinating with the institutes, startups, 5G use case lab vendors etc.

viii) 5G Use Case labs and Sanchar Mitras:

LSA officers visited the 5G use case labs for reviewing their readiness. Sanchar Mitras inducted under the Sanchar Mitra program have been provided guidance by LSAs on various diverse citizen centric initiatives of the Department. Sanchar Mitras, spread across the country, have played an important role by disseminating these initiatives to the common public.

4.3.4 Rural Vertical:

i) Monitoring of mobile coverage status of all villages in the country: -

According to the list provided by the Policy Wing of the Department of Telecommunications (DoT), the rural division is maintaining the mobile coverage status of 6,44,131 villages, based on inputs from all Licensed Service Areas (LSAs). The LSAs collect coverage data from all Telecom Service Providers (TSPs) and verify it on a sample basis.

As of October 31, 2024, 6,23,662 villages are covered with 2G/3G/4G technology, out of the total 6,44,131 villages.

ii) Monitoring of telecom connectivity in villages under VVP: -

The Government has approved the Vibrant Village Programme (VVP) for the comprehensive development of villages located along the northern border in five states—Arunachal Pradesh, Himachal Pradesh, Uttarakhand, Sikkim—and the Union Territory of Ladakh. A total of 662 villages are included under VVP Phase-I.

As of October 31, 2024, 345 of these villages have 4G coverage. The remaining uncovered villages are included in the 4G Saturation Project of BSNL, funded by DBN of the Department of Telecommunications.

iii) Monitoring of telecom connectivity in villages under BADP: -

The Border Area Development Programme (BADP), a scheme under the Ministry of Home Affairs (MHA), includes 17,611 villages across 17 states: Arunachal Pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Punjab, Rajasthan, Sikkim, Tripura, Uttar Pradesh, Uttarakhand, and West Bengal.

As of October 31, 2024, mobile coverage has been extended to 16,917 villages under this program. The remaining uncovered villages are planned to be covered under the 4G Saturation Project or other initiatives funded by DBN of the Department of Telecommunications (USOF).

iv) Monitoring of Key Performance Indicator (KPI) of mobile coverage under Mission Utkarsh: -

An initiative launched by the Hon'ble Prime Minister aims to improve the Key Performance Indicator (KPI) of mobile coverage in inhabited census villages across 10 selected districts: Middle Andaman, East Godavari, West Kameng, Sukma, Chamba, Kargil, Barwani, Gadchiroli, Malkangiri, and Jaisalmer. The objective is to bring district-level mobile coverage to the state average within one year and to the national average or higher within two years.

The total number of villages across these 10 districts is 8,609, of which 1,695 villages remained uncovered as of October 31, 2024. Respective LSAs are collaborating with Telecom Service Providers (TSPs) for improving the telecom connectivity. The KPI status for mobile coverage as of October 31, 2024, is 80.31%.

4.4 Digital Bharat Nidhi (DBN)

4.4.1 Organizational Structure and Functions and Objectives of DBN:

i) Organizational Structure

The Digital Bharat Nidhi (DBN), created by an Act of Parliament, is headed by Administrator DBN appointed by the Central Government, for the administration of the fund. It is an attached office of the Department of Telecom, Ministry of Communications.

ii) Amendment to Indian Telegraph Act, 1885 for creation/ administration of DBN:

The Universal Service Support Policy for provision of telecom facilities in rural and remote areas of the country came into effect from 01.04.2002. The guidelines for universal service support policy were issued by DoT and were placed on the DoT website on 27th March 2002. Subsequently, the Indian Telegraph Act, 1885 was amended in December, 2003 vide the Indian Telegraph (Amendment) Act, 2003 thereby creating USOF. The USO Fund was established with the fundamental objective of providing fund support for access to 'Basic' telegraph services to people in the rural and remote areas at affordable and reasonable prices. Subsequently, the Indian Telegraph Act was amended on 29.12.2006 widening the scope of USOF to provide access to various telegraph services (including mobile services, broadband connectivity and creation of infrastructure like OFC) in rural and remote areas.

As per the Telecommunication Act, 2023 (No.44 of 2023) and the subsequent notification of Telecommunications (Administration of Digital Bharat Nidhi) Rules 2024 dated 30.08.2024, the Universal Service

Obligation Fund (USOF) created under the Indian Telegraph Act, 1885, has been renamed as “Digital Bharat Nidhi” (DBN).

iii) Rules for administration of DBN

The Rules for administration of the Fund, known as Indian Telegraph (Amendment) Rules, were initially notified on 26.03.2004. The Rules were subsequently amended as Indian Telegraph (Amendment) Rules 2006 in order to enable support for mobile services and broadband connectivity in rural and remote areas of the country and the same were published in Gazette on 17.11.2006. Thereafter, the Rules have been notified on 30.08.2024 as the Telecommunications (Administration of Digital Bharat Nidhi) Rules 2024.

iv) Functions & objectives of DBN

The Digital Bharat Nidhi was established with the fundamental objective of providing access to 'basic' telecom services to people in the rural and remote areas at affordable and reasonable prices. Subsequently the scope was widened to provide subsidy support for enabling access to all types of telecom services, including mobile services, broadband connectivity and creation of infrastructure like OFC in underserved rural, remote and urban areas.

The implementation of the DBN related activities is carried out by the “implementers”, i.e. the entities having valid license or registration or authorization from Central Government/ Department of Telecommunication for providing telecom services or infrastructure or any other entities as specified by the Central Government from time to time. The implementation status of the activities, being undertaken by the DBN, is available on DBN website (www.usof.gov.in).

The resources for implementation of DBN are raised by way of collecting a Universal Access Levy (UAL) from all the Licensees of Department of Telecommunications, which is 5% of the Adjusted Gross Revenue (AGR) of Telecom Licences. It is a non-lapsable Fund. Levied amount is credited to Consolidated Fund of India. Fund is made available to DBN through budgetary provision after due appropriation by Parliament.

v) As per the latest Act and Rules, the following shall also be supported by the DBN:

- a) Schemes and projects for providing targeted access to telecommunication services for underserved groups of the society, such as, women, persons with disabilities and economically and socially weaker sections
- b) Provision of telecommunication services, including mobile and broadband

services and telecommunication equipment required for delivery of telecommunication services, and enhancing telecom security in underserved rural, remote and urban areas

- c) Creation of telecommunication network for provisioning of telecommunications services, including mobile and broadband services, in underserved rural, remote and urban areas;
- d) Introduction of next generation telecommunication technologies in underserved rural, remote and urban areas
- e) Provide or improve access to advanced telecommunication services in underserved rural, remote and urban areas
- f) Improve affordability of telecommunication services in underserved rural, remote and urban areas
- g) Promote innovation, research and development, promotion and commercialization of indigenous technology development and associated intellectual property including creation of regulatory sandboxes
- h) Develop and establish relevant standards to meet national requirements and their standardisation in international standardisation bodies
- i) Encourage start-ups in telecommunications sector
- j) Create bridge between the academia, research institutes, start-ups and industry for capacity building and development of telecom ecosystem;
- k) Create new technological solutions and deploy new technologies for improving access to telecommunications services;
- l) Promote sustainable and green technologies in telecommunications sector.

Establish or fund any person to promote telecommunications growth, telecommunications research and development, standards, start-ups and telecom manufacturing facilities towards Atmanirbhar Bharat.

4.4.2 Implementation status of the ongoing activities:

i) BharatNet:

BharatNet project is being implemented in a phased manner to provide broadband connectivity to all Gram Panchayats (GPs) and villages in the country. The Phase-I has been completed in December 2017 with the implementation of over 1 lakh GPs, and the remaining Gram Panchayats are being connected under various models of implementation, i.e. State-led Model, CPSU-led Model, Private Sector-led model, etc.

As on 31.10.2024, 6,92,099 km Optical Fibre Cable has been laid, and 2,09,267 GPs are Service Ready on OFC. In addition, 5,016 GPs have been

connected over satellite media. Total 2,14,283 GPs are service ready. 11,74,536 FTTH connections have been installed by BSNL & others ISPs using BharatNet. Overall data usage on BharatNet is about 1,37,967 (TB) for the month of Oct-2024.

The Operation, First Line Maintenance (FLM) and utilization of BharatNet (except State led model Phase-II) has been handed over to BSNL with effect from 01.04.2022 for better management and synergy. BSNL has developed Franchisee Management System (FMS) for on boarding the franchisees and revenue share partners of BSNL/BBNL and more than 12,000 Channel Partners (BharatNet Udyamis) have been made. BSNL has been given a pilot project for providing 5 lakh FTTH connections using BharatNet on revenue sharing basis through BharatNet Udyamis in the rural areas. Under amended BharatNet program, BSNL is to provide 1.5 crore FTTH connections using BharatNet in next five years.

On 30.06.2021, the scope of BharatNet was extended upto all inhabited villages beyond GPs. The Government accorded approval for a revised strategy for implementation of BharatNet through PPP model in 16 States of the country covering about 3.61 lakh villages (including GPs) at a maximum cost of Rs. 19,041 Crore on VGF. Therefore, the total approved cost of BharatNet project is now Rs. 61,109 Crore (i.e., Rs. 42,068 Crore for BharatNet (Phase-I and Phase-II) and Rs. 19,041 Crore on VGF for PPP model in 16 States). For implementation of the PPP model in 16 States, the Request for Proposal (RFP) was floated on 20.07.2021 through global bidding for selection of the Private Sector Partner(s) and bid was opened on 27.01.2022, with last date of bid submission on 27.01.2022. No bid was received to PPP Model on 27.01.2022.

ii) Amended BharatNet program:

- a) The Union Cabinet accorded its approval on 04.08.2023 regarding Amended BharatNet Program to provide high speed broadband connectivity to all inhabited villages in the country. The Project will be fully funded through Digital Bharat Nidhi (DBN), Department of Telecommunications (DoT) at an estimated cost of INR 1,39,579 crore. Bharat Sanchar Nigam Limited (BSNL) will be the overall Project Management Agency. Eight States (Gujarat, Odisha, Jharkhand, Andhra Pradesh, Telangana, Maharashtra, Chhattisgarh, Tamil Nadu) are given the responsibility of implementing BharatNet Phase-II. It is proposed to implement BharatNet further in these states on the basis of discussions with these states on issues such as new terms and conditions for the SPV, handing over of the present network to DBN/DoT etc.

- b) Under the current scope of the BharatNet, the Gram Panchayats (GPs) are primarily connected in linear structure because of which the reliability of the network is low. However, under the amended program an estimated 2.64 lakh GPs are proposed to be connected in ring network. The remaining 3.8 lakh villages are proposed to be connected on demand basis.
- c) The network shall be maintained by professional agencies specialized in optical fiber networks, selected through bidding process by BSNL. These agencies will maintain network for a period of 10 years to high defined standards of availability. It is also proposed to engage a professional private sector partner for the Network Operations Center (NOC) to design, build, operate and maintain the NOC for 10 years.
- d) The last mile network will be managed through BharatNet Udyamis who could be a village level entrepreneur, Internet Service Provider, Self Help Group etc. Udyamis will be given a one-time financial incentive for activating new home fiber connections. To incentivize continuity of services, Udyamis will also receive a share of the monthly revenue (on established market practice). It is proposed to eventually provide 1.50 crore rural home fiber connections using the Udyami model over the next five years. In order to fast track last mile connectivity, about 100 districts to be identified for prioritizing expenditure on upgradation of infrastructure and subsidy to home fibre connections.
- e) BSNL will provide Internet Leased line (ILL) to all 7,269 blocks with sufficient bandwidth to ensure minimum 25 Mbps download speed to every home fibre subscriber.
- f) Alternate technologies (radio/satellite) including Low Earth Orbit/Medium Earth Orbit (LEO/MEO) satellite communication services, when matured may be considered for deployment based on the requirement and cost effectiveness in cases where the implementation of OFC may not be economical/feasible.
- g) Extension of BharatNet to all inhabited villages with reliable, quality, high speed broadband will enable better access of e-services offered by various Central and State Government agencies. It will also enable online education, telemedicine, skill development, e-commerce and other applications of broadband. It is expected that revenue will be generated from different sources including proliferation of broadband connections to individuals & institutions, sale of dark fibre, fiberization of mobile towers, e-commerce etc.

iii) Comprehensive Telecom Development Plan (CTDP) for the North-Eastern Region:

a) Mobile Services in Uncovered Villages of Arunachal Pradesh and 2 Districts of Assam:

As per Government approval on 09.12.2020, provision of 4G mobile services in 2374 uncovered villages in Arunachal Pradesh and two Districts of Assam (Karbi Anglong & Dima Hasao) will be carried out. Accordingly, work has been awarded and Agreements have been signed on 29.10.2021 for Arunachal Pradesh and on 01.11.2021 for two Districts of Assam with the Telecom Service Providers for execution of the scheme. After physical survey, 1,370 Villages have been found uncovered for which 773 towers are planned out of which, till October, 2024, in Arunachal Pradesh 417 sites have been commissioned covering 820 villages & in two Districts of Assam, 222 sites have been installed and commissioned covering 303 villages.

b) Provision of 4G based Mobile Services in Uncovered Villages and National Highways of Meghalaya:

As per Government approval in May 2018, provision of 4G mobile services in 1164 uncovered villages and seamless coverage along National Highway locations, 1175 4G Mobile Towers have been planned in Meghalaya State. Accordingly, work has been awarded and Agreement has been signed on 04.09.2020 with the Telecom Service Provider for execution of the scheme. Survey work of all villages have been completed. Further, 723 additional uncovered villages of Meghalaya were added in the schemes for which 528 Mobile Towers have been planned. Till October-2024, 432 sites have been installed and commissioned covering 624 villages and 03 NH sites.

iv) Implementation of Comprehensive Telecom Development Plan for Islands:

Telecom Commission in its meeting held on 07.11.2014 approved, in principle, an Integrated and Comprehensive Telecom Development Plan for Andaman & Nicobar Islands and Lakshadweep in accordance with TRAI recommendations dated 22.07.2014 for 'Improving Telecom Services in Andaman & Nicobar Islands and Lakshadweep'. The plan consists of the following schemes:

a) Andaman & Nicobar Islands

- Submarine OFC Connectivity between Chennai and Andaman & Nicobar Islands:

Submarine OFC connectivity (2312 Kms.) completed in August 2020

and current bandwidth utilization is 205 Gbps.

- Satellite Bandwidth Augmentation for Andaman & Nicobar Islands:

Work of augmentation of satellite bandwidth from 2 Gbps to 4 Gbps has been successfully implemented by BSNL.

- Provision of 4G Mobile Coverage in Uncovered Villages and seamless 4G Mobile coverage of National Highway NH-4 (Erstwhile NH-223) in Andaman & Nicobar Islands:

DCC in its meeting held on 20.12.2019 approved the proposal for setting up of 82 towers to provide 4G mobile services in identified 85 uncovered villages and 42 towers for providing seamless mobile coverage by bridging the gaps along uncovered NH-4 (Erstwhile NH-223). The CAPEX & OPEX for 5 years are funded by DBN through VGF Model [Total: Rs 129.58 Crore (excluding taxes)]. Agreement was signed between DBN and M/s RJIL on 15.03.2021 as an outcome of the open tender floated by DBN. As on date, 88 tower sites [Village: 41, Highway: 47] have been approved by DBN as against 124 tower sites survey reports submitted by M/s RJIL. Site acquisition is under process in coordination with UT ANI & LSA. Satellite Bandwidth to RJIL for the project has been allocated by ISRO and 66 sites have been commissioned so far covering 20 villages and 46 NH sites.

b) Lakshadweep Islands:

- Submarine OFC Connectivity between Kochi and Lakshadweep Islands:

Cabinet in its meeting held on 09.12.2020 approved provision of Submarine Optical Fibre Cable Connectivity between Kochi and Lakshadweep Islands (KLI Project) comprising of Kavarati and ten other Islands, namely, Kalpeni, Agatti, Amini, Androth, Minicoy, Bangaram, Bitra, Chetlat, Kiltan and Kadmat. The total estimated Route length is about 1,772 km and the total financial implication is about Rs.1072 crore (excluding taxes). BSNL, the Project Execution Agency, has awarded the work for Submarine System on 28.09.2021 to M/s NECC IPL as an outcome of global tender floated by them. Process of laying of land & submarine OFC cables along with other essential procedures have been completed. The project has been commissioned & dedicated to the nation on Jan 3, 2024. 5G services and FTTH services have been launched in Lakshadweep using KLI bandwidth.

- Provision of 4G Mobile Services, Augmentation of OFC Transmission Network & Provision of FTTH services in Lakshadweep Islands:

Hon'ble MoC provided approval in Nov-2021 for the award of the work for augmentation of Telecom infrastructure in Lakshadweep islands to BSNL on nomination basis at the total cost of Rs. 60.61 Cr. The works includes: (I) Upgradation of 19 existing 2G tower sites to 4G mobile services at the cost of Rs.16.91Cr. (II) Installation of additional 18 new mobile tower sites (including Suheli Island) for provision of 4G mobile services at the cost of Rs.18.81Cr. (III) Creation of 225Km OFC network for provision of FTTH in Lakshadweep Islands. This includes the operation and maintenance cost for 5 years with provision of services at the same QoS/ SLA for 10 years at the cost of Rs.24.89Cr. 14 sites have been upgraded from 2G to 4G technology. OFC laying work is completed and 6851 FTTH connections have been provided.

- v) Re-provisioning of Digital Satellite Phone Terminals (DSPTs) provided to MHA agencies (CAPFs), MoD agencies (Army, BRO) and other agencies using VSAT connectivity under BharatNet Project:

These DSPTs are provided in remote, rural, far-flung and difficult terrain where no coverage from any other operator is available. As a short term measure, INMARSAT terminals were provided to MHA agencies (CRPF, BSF, ITBP, & SSB) and MoD agencies (Indian Army & BRO) to meet their critical communication needs. DCC in its meeting held on 20.12.2019 approved the proposal for provisioning of Digital Satellite Phone Terminals (DSPT) to these agencies using VSAT connectivity. As on 31.10.2022, 1382 VSATs have been made operational out of total 1409 (including 124 Ladakh VSATs).

- vi) Mobile Service in Uncovered Villages:

- a) 354 Border Villages Scheme:

Government has prioritized to reach remote areas of the country such as North-Eastern States, Islands, Himalayan States, Western Border States and more importantly the Left-Wing Extremism (LWE) affected areas in the first phase. Agreement has been signed on 28.04.2020 for provision of mobile service in 354 uncovered villages of J&K, Ladakh, Himachal Pradesh, Uttar Pradesh, Bihar, Rajasthan, Gujarat, Uttarakhand, Border areas and other priority areas was awarded. Further, additional order to cover 55 villages of Uttarakhand, J&K, Rajasthan and Gujarat has been given under the scheme. Scope after survey is reduced to 336 villages mainly due to existing coverage for which 312 Mobile Towers have been planned. As on October, 2024, under 354 uncovered villages schemes, 319 villages have been covered with 4G mobile services by installing 295 mobile towers.

b) LWE- Phase-I

The cabinet on 20.08.2014 has approved a project for provisioning of mobile services (2G based) at identified locations by Ministry of Home Affairs (MHA) in the States of Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Maharashtra, Madhya Pradesh, Odisha, Telangana, Uttar Pradesh and West Bengal, which are affected by Left Wing Extremism (LWE). The work was awarded to M/s BSNL on nomination basis and Agreement was signed on 30.09.2014. Under this scheme, 2343 sites are installed, commissioned and providing services and the Project is completed. Further, extension of O&M of existing 2G sites approved by union cabinet.

Union Cabinet has approved the upgradation of existing LWE towers from 2G to 4G by BSNL on nomination basis on 27.04.2022. As per Cabinet approval, Time line for upgradation is Twelve months for 4G Upgradation of existing network from the date of roll-out of 4G services by BSNL in India. Work has been awarded to vendor for upgradation by BSNL. Till October 2024, 78 mobile towers (Chhattisgarh-75 & Maharashtra-3) have been upgraded to 4G under LWE Phase-I upgradation.

c) LWE- Phase-II

The Union Cabinet on 23.05.2018 approved a project for provisioning of 4G mobile services at MHA identified tower locations in 10 LWE affected States.

Agreements have been signed with M/s Reliance Jio Infocomm Limited (RJIL) on 28-09-2021 for the states of Madhya Pradesh, Chhattisgarh, Odisha and Maharashtra and with M/s Bharti Airtel Limited (BAL) on 01-10-2021 for the states of Andhra Pradesh, Bihar, Jharkhand, Telangana, Uttar Pradesh and West Bengal. 270 more sites have been added to the project with roll out period upto 20-03-2025.

Till October, 2024, survey for 2,378 tower locations have been completed and survey for remaining locations is in progress. After physical survey, 1,219 locations have been found uncovered for which 1,160 towers are planned out of which, till October 2024, 991 sites have been commissioned covering 1,046 locations.

- vii) Saturation of 4G mobile services: The Union Cabinet on 27.07.2022 approved a project for saturation of 4G mobile services in uncovered villages across the country at a total cost of Rs. 26,316 Crore. The project will provide 4G mobile services in 24,680 uncovered villages in remote and difficult areas. The project has a provision to include 20% additional villages on account of rehabilitation, new-settlements, withdrawal of

services by existing operators etc. In addition, 6,279 villages having only 2G/3G connectivity shall be upgraded to 4G. The project is being executed by BSNL using Atmanirbhar Bharat's 4G technology stack and has been funded through Universal Service Obligation Fund. Agreement was signed with BSNL on 06.02.2023 with estimated cost of Rs. 30,620 crores. Survey work of about 63,000 villages have been completed. Further, survey work of approx. 4000 additional villages are in progress. Work of land allocation and infrastructure works for the towers is under progress. So far, more than 12,566 new Mobile Towers have been erected. Regular review meetings are held by DoT/DBN with BSNL, to expedite the implementation. After physical survey, 23,465 villages have been found uncovered for which 17,548 towers are planned out of which, till October 2024, 4962 sites have been commissioned covering 6683 villages.

viii) Aspirational Districts Scheme

a) 502 Aspirational District scheme:

A Scheme for 502 uncovered villages across 112 Aspirational District over four States (namely Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan) for provisioning of 4G based Mobile services has been awarded and the project is under implementation. Further, 27 villages of Madhya Pradesh were added in the schemes where work is in progress. Till October 2024, 200 mobile towers and associated infrastructure have been installed, commissioned and covering 235 villages.

b) 7287 Aspirational District scheme:

A scheme for providing 4G mobile Services in 7,287 uncovered villages across 44 Aspirational Districts of 5 States (Andhra Pradesh, Chhattisgarh, Jharkhand, Maharashtra and Odisha) has been approved by Government on 17.11.2021. The agreement has been signed on 20-05-2022. Survey for 6,707 villages have been completed and are in progress for remaining 580 uncovered villages. After physical survey, 5385 Villages have been found uncovered for which 3678 towers are planned out of which, till October 2024, 2,177 sites have been commissioned covering 3,352 villages.

4.4.3 Status of Digital Bharat Nidhi (erstwhile USO Fund):

As on 30.09.2024 Universal Access Levy (UAL) amounting to Rs.1,67,987.68 crore has been collected and the total allotment amounting to Rs. 83,726.11 crore have been utilized to fulfill the objective of DBN. As on 30.09.2024, a total of UAL balance is available as Rs. 84,261.57 crore (Rs. 45,297.37 crore in DBN Reserve Fund and Rs. 38,964.2 crore in CFI).