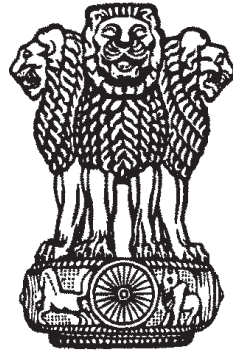


ANNUAL REPORT 2022-23



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सत्यमेव जयते

Department of Telecommunications
Ministry of Communications
Government of India
New Delhi
<https://dot.gov.in>



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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; 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 all 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 for building up adequately trained manpower for telecom programme, including-
 - (a) assistance to institutions, assistance to scientific institutions and to universities for advanced scientific study and research; and
 - (b) 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:
 - (a) The Indian Telegraph Act, 1885 (13 of 1885);
 - (b) The Indian Wireless Telegraphy Act, 1933 (17 of 1933); and
 - (c) The Telecom Regulatory Authority of India Act, 1997 (24 of 1997).
- Indian Telephone Industries Limited.
- Post disinvestment matters relating to M/s Hindustan Teleprinters Limited.
- Bharat Sanchar Nigam Limited (BSNL),
- Mahanagar Telephone Nigam Limited (MTNL).
- Videsh Sanchar Nigam Limited and Telecommunications Consultants (India) Limited

- All matters relating to Centre for Development of Telematics (C-DOT).
- Residual work relating to the erstwhile Department of Telecom Services and Department of Telecom Operations, including matters relating to-
 - (a) cadre control functions of Group 'A' and other categories of personnel till their absorption in Bharat Sanchar Nigam Limited;
 - (b) administration and payment of terminal benefits.
- Execution of works, purchase and acquisition of land debitible 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:

- Formulating the policy of Department of Telecommunications for approval of the Government;
- Preparing the budget for the Department of Telecommunications for each financial year and getting it approved by the Government; &
- 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

The Digital Communications Commission: -

- (i) Approved the following in relation to recommendations of TRAI regarding “Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed”:
 - a) The licensees authorized to provide Fixed line services may be incentivized by way of exemption of License Fee earned from Fixed-line services (voice, internet and video including IPTV) for 10 years.
 - b) All Service Providers providing fixed line services may be given the benefit of License Fee exemption on the revenues earned from Fixed-line services.
- (ii) Approved the proposal for providing Comprehensive 4G mobile coverage in remaining Uncovered Villages in the country on nomination basis to BSNL through USOF as under:
 - a) Submitting the case for approval of the Cabinet for Provisioning of 4G mobile services to 24,680 uncovered villages across the country by installing 16,464 4G mobile towers at an estimated cost of Rs 17,664 Cr. (CAPEX + OPEX for 5 years) (excluding taxes and levies) to be funded by Universal Service Obligation Fund on cost plus with 10% as administrative charges.
 - b) For provision of coverage to 4,936 additional villages as 20% extra villages for rehabilitated villages, dropout from existing contracts due to RoW, weather or other local conditions, new settlements, inability by TSPs to fulfill promised coverage, withdrawal of services by existing operators etc., additional approval of Rs. 3,496 Cr. is granted.
 - c) The work shall be awarded on nomination basis to BSNL. The ownership of Asset created under this project will be with BSNL and the timeline/rollout for the implementation for the project will be 24 months.

- (iii) Approved the following in relation to recommendations of TRAI on 'Traffic Management Practices (TMPs) and Multi-Stakeholder Body for Net Neutrality':
- "There is no need to establish a multi-stakeholder body (MSB). The task of formulating Traffic Management Practices (TMPs) for consideration of DoT may be assigned to Telecommunication Engineering Centre (TEC). TEC may formulate such TMPs in consultation with TSPs, ISPs and other stakeholders. As the list of TMPs is dynamic, the same will be required to be updated by TEC periodically".
- (iv) Approved for Handover of Operation and Maintenance (O&M), First Line Maintenance (FLM) and Utilization of BharatNet (Except State led model under Phase – II) to BSNL from 01.04.2022 and authorizing BSNL to award work to a professional agency for SLA based O&M and FLM of BharatNet Phase-I network through an open and competitive bidding process as under:
- a) Handover of O&M, FLM and Utilization of BharatNet (Except State led model under Phase-II) to BSNL from 01.04.2022.
 - b) Financial approval of Rs. 4355.37 Crore (excluding taxes) for executing the work of O&M and FLM of BharatNet Phase-I Network through BSNL for two years.
 - c) Authorized BSNL to float a tender and award work to a professional agency for SLA based O&M, FLM for one year extendible up to one more year subject to performance assessment by BSNL. The payment from USOF to BSNL will be made as per actual based on tendered discovered cost.
 - d) In-principle Authorization to BSNL to utilize BharatNet for Last Mile Connectivity till the final decision is taken by Cabinet on the revised BharatNet Model.
 - e) To include the above cost of O&M and FLM in the combined proposal of restructured PPP Model of BharatNet for approval of Union Cabinet.
 - f) Amendment of Rules 525 & 526 of the Indian Telegraph Rules, which states that financial support from USOF, is to be provided on net cost basis and the selection of Universal Service Providers shall be through open bidding process, since BSNL is being awarded the work on nomination basis.
 - g) Administrator, USOF be empowered to take appropriate decisions regarding the implementation strategy (including the terms and conditions of the Agreement to be signed between USOF and BSNL) within the financial approval accorded by the DCC as mentioned in para (ii) above.
- (v) Approved the following with regard to Telecom Regulatory Authority of India (TRAI) response dated 09.05.2022 to DoT's back reference dated 29.04.2022 on TRAI recommendations dated 11.04.2022 on "Auction of Spectrum in frequency bands identified for IMT/5G":
- a) Some spectrum to be reserved for BSNL for 5G in 600 MHz, 3300 MHz and 26 GHz bands, 5 MHz (paired) in 700 MHz for NCRTC and all the balance spectrum be put to auction.

- b) Guard band between 800 MHz & 900 MHz bands and within 1800 MHz band to be removed as recommended by the TRAI.
- c) The 27.5 to 28.5 GHz is to be considered after receipt of the TRAI recommendations on space-based communication.
- d) For 600 MHz band APT 600 (Option B1) plan, for 3300 MHz band the n77 and/or n78 plan and for 26 GHz band n257 and/or n258 plans to be adopted.
- e) To promote the efficient use of available spectrum, harmonization exercise in 800 MHz, 900 MHz, 1800 MHz bands to be taken up immediately after conducting the auction and be completed within a time frame of not more than 6 months from the date of conclusion of Auction.
- f) Block sizes and minimum amount of spectrum to bid to be adopted for auction of spectrum in the forthcoming spectrum auction.
- g) The validity period for spectrum assignment through upcoming auction shall be 20 years.
- h) Relevant clause of the NIA for the forthcoming auction to be modified to include IMT 2020 (5G) among the type of technologies which were permitted in the spectrum auction of 2021.
- i) For 3300 MHz and 26 GHz bands, band-wise separate roll-out obligations be made applicable; number of sites to be deployed may be reduced as compared to those recommended by TRAI. For other bands, TRAI recommended roll-out obligations to be adopted.
- j) Same eligibility criteria, lock-in period of equity and associated conditions as followed for participation in the last auction held in March 2021 be considered for forthcoming auction.
- k) TSPs be permitted to surrender spectrum after a minimum period of 10 (ten) years.
- l) Given the fast-changing techno-commercial ecosystem, spectrum valuation be sought from TRAI for each spectrum auction.
- m) A discount of 50% on Reserve Price is to be provided for North East and Jammu & Kashmir LSAs.
- n) Reserve prices of spectrum in 600 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz bands as recommended by TRAI be adopted for the forthcoming spectrum auction.
- o) The following provisions shall be made for enabling the setting up of Private Captive Networks:
 - 1) Access Service providers may provide private network as a service to an

- enterprise by using network resources (such as through network slicing) over its PLMN public network.
- 2) Access Service providers may establish isolated Captive non-public network for the enterprises using IMT spectrum acquired by them.
- p) Considering increased capacity backhaul requirements of TSPs-especially due to 5G, an interim arrangement of assignment of up to two carriers (each carrier of 250 MHz paired bandwidth) in E-band spectrum for backhaul purposes, LSA wise, to each TSP with access service authorization, to be made with pricing of 0.15% of AGR, for each carrier on similar lines as the provisional allotment of carries for MWA/MWB purposes, pending final decision on spectrum assignment methodology and pricing of E band spectrum.
- (vi) Approved the proposal regarding provision of 4G mobile coverage at Border Out Posts (BOPs) of various Border Guard Forces (BGFs) and Border Intelligence Posts (BIPs) of Intelligence Bureau (IB) as under with timeline for implementation of the project shall be 18 months:
 - a) Submitting the case for approval of Cabinet for provision of 4G based mobile services at 1117 locations of Border Out Posts (BOPs) of various Border Guard Forces (BGFs) and Border Intelligence Posts (BIPs) of Intelligence Bureau (IB) on nomination basis to BSNL. The ownership of the assets created under the project will be with BSNL.
 - b) Estimated cost of Rs. 1545.660 Cr [CAPEX Rs. 600.076 Cr + OPEX Rs. 945.584 Cr. For 5 years (including Rs 447.630 Cr for VSAT bandwidth @ 8 Mbps for 5 years)], excluding taxes. OPEX to be borne by DoBM, MHA.
 - c) Overall variation of 20% for Rs 309.132 Cr in estimate for additional BOPs/BIPs locations.
 - (vii) Approved for accepting the Standing Committee recommendations on TRAI recommendations on methodology of applying Spectrum Usage Charges (SUC) under the weighted average method of SUC assessment in cases of Spectrum Sharing and not accepted TRAI's recommendations for applicability of 0.5% increase on SUC rate in specific band in which sharing is taking place and not on the entire spectrum holding (all bands) of the Licensee as this has retrospective effect. As per Telecom reforms w.e.f. 01.10.2021, the SUC in cases of spectrum sharing has been abolished. In view of this, DCC approved that increment of 0.5% on SUC rate will be applicable only till 30.09.2021.
 - (viii) Approved guidelines for administering the fund and financing the Research and Developmental proposals. The salient features of the guidelines are as under:
 1. To promote Research and Development in the field of Telecommunication Technologies and Solutions in line with Hon'ble Prime Minister's call of "Jai Anusandhan".

2. To enable affordable broadband and mobile service proliferation in rural and remote areas wide areas of technologies and solutions have been covered.
3. Creation of Intellectual Property Rights.
4. Funding through grants to Indian entities covering private, government, academic and research institutions.
5. Transparent and objective evaluation and approval criteria.
6. Well defined process for implementation and monitoring of approved projects.
7. Independent review by third party.

The DCC further suggested for inclusion of a clause regarding use of IPR by Government for public use. The DCC also observed that 5% of the fund of USOF allocated for R&D should not be non-lapsable.

- (ix) Approved for implementation of a digital platform under the aegis of Digital Intelligence Unit (DIU) with a financial outlay of Rs.414.94 core for design, development, deployment, O&M, AMC of digital platform along with capacity building and awareness for a period of 5 years. DCC was of the view that privacy of data is paramount and directed that safety and security of data must be ensured. The DCC further directed that DIU should not result in increased processing time and administrative blockage in issuing new connection.

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 DoT has four attached offices: (i) Universal Service Obligation Fund (USOF); (ii) Telecommunication Engineering Centre (TEC); (iii) Director General Telecom and (iv) Controller General of Communication Accounts (CGCA).

The DoT has four subordinate offices, namely, (i) the Wireless Monitoring Organisation (WMO) (which functions under the Wireless Planning and Coordination wing of DoT); (ii) the National Telecommunications Institute for Policy Research, Innovation & Training (NTIPRIT); (iii) the National Centre for Communication Security (NCCS) and (iv) the National Institute of Communication Finance

(NICF). The Department also performs certain regulatory and enforcement functions in the domain of satellite communications through its Network Operations Control Center (NOCC).

There are 37 DoT Field Units in all the 22 Licensed Service Areas (LSAs) located across the country, which are under the administrative control of the Director General Telecom. There are 28 Controller of Communication Accounts (CCAs) offices located across the country, which are under the control of the CGCA.

The functions of these offices are given in the following paragraphs, in brief ¹.

1.5.1 Universal Service Obligation Fund (USOF): 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 DoT, and is headed by the Administrator, USOF, appointed by the Central Government.

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

1.5.2 Telecommunications Engineering Centre (TEC): TEC is the Technical Wing of DoT. Its Mission is to:

- Develop new specifications and update the existing ones in order to keep pace with the global development.
- Establish state-of-art telecom laboratories.
- 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.
- 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 and headed by an Apex Level Officer. The DGT was created with an objective of monitoring and controlling the Department's LSA field units in all the 22 LSAs located across the country. Headquarters of Director

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

General Telecom (DGT-HQ) is located in Delhi.

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 synchronisation 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.

1.5.4 Controller General of Communication Accounts (CGCA): The office of CGCA is an attached office of the DoT and is headed by an apex level officer. The office of CGCA presently functions from the NICF Campus at Ghitorni, New Delhi. CGCA has been tasked to supervise the functioning of Controller of Communication Accounts (CCAs). There are 28 CCAs offices located across the country.

The Principal 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. WMO has its own Training Facility at Wireless Monitoring Training & Development Centre (WMTDC), New Delhi, a nodal agency for conducting training courses for officials and staff of Indian Radio Regulatory Service.

1.5.6 National Telecommunications Institute for Policy Research, Innovation & Training (NTIPRIT): NTIPRIT was established in the year 2010 as National Telecom Academy, the telecom training institute of DoT. Subsequently, in year 2011, the mandate of institute was expanded by bringing into the activities related to policy research and innovations under its ambit and the Institute was rechristened as National Telecommunications Institute for Policy Research, Innovation & Training. The institute is now a Central Training Institute (CTI) enlisted with Department of Personnel & Training (DOPT). NTIPRIT is presently operating from the campus of the Advance Level Telecom Training Centre (ALTTC) of BSNL at Ghaziabad, UP.

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 The National Institute of Communication Finance (NICF): The NICF, established in 2000, is a DoPT recognized CTI under the DoT. The NICF has been entrusted with the responsibility of imparting training to Indian Posts & Telecom Accounts and Finance Service (IP&TAFS) Group 'A', 'B' & 'C' cadres, which includes Probationary Training of IP&TAFS Group 'A' officers recruited by the UPSC through Civil Services Examination as well as induction Training of Group 'B' & 'C' cadres apart from organizing and conducting regular national and international seminars and workshops.

1.5.9 Network Operations Control Center (NOCC): NOCC: performs the function of online operational control, coordination regulation of space segment usage and monitoring of all the satellite based services like VSAT (Very Small Aperture Terminal) applications, broadcasting, DTH (Direct-To-Home), HITs (Head-end in the Sky), ISP (Internet service provider) etc. in India on Indian and foreign satellites; resolving the RF (Radio frequency) interference, mandatory performance verification testing of antennae of satellite earth stations and DSNG (Digital Satellite News Gathering). NOCC monitors and controls parameters of carrier uplink from 1590 Satellite Earth Stations/Teleports/DSNG & more than 2,84,000 VSATs. NOCC has endeavored to provide interference free environment to various satellite users in country while providing mandatory clearances within three working days to applicant agencies. The offices of NOCC are located in Delhi, Gurugram and Sikandrabad.

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 R&D arm of the Department. Brief functions of these organizations are given below².

1.6.1 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 MTNL

MTNL, set up in 1986, provides telecommunication facilities in metros viz. - Delhi and Mumbai.

²Further details on the PSUs and autonomous bodies is given in chapter 5.

MTNL provides fixed-line service in these two Metropolitan Cities. For Cellular services, the company has the license to provide services in Delhi including 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 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 BBNL

Bharat Broadband Network Limited (BBNL) was incorporated as a Special Purpose Vehicle (SPV) of BharatNet (earlier known as National Optical Fibre Network) in 2012, as the executing agency for BharatNet. To synergize the O&M and Utilization of BharatNet network, Union Cabinet, on 27.07.2022 approved the proposal for merger of BBNL with BSNL. The activities regarding formal merger of BBNL with BSNL is under process.

1.6.6 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

2.1.1 5G Services

- i. 5G spectrum auction: The foundation for ushering 5G services in India was laid with the 8th Spectrum Auction, held in July 2022. Government of India had put 72,098 MHz spectrum to auction, of which 51,236 MHz (71% of the total) has been sold with bid amounting to Rs. 1,50,173 cr. This is the highest-ever auction revenue proceeds received from a single auction. Further, in this auction highest number of bands i.e., 10 different bands across 22 LSAs (Licensed Service Areas) were simultaneously put to auction (i.e., 600 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz and 26 GHz).

The telecom reforms and clear policy direction led to spectrum auction of 2022 garnering highest ever bids. The recent reforms like zero spectrum usage charges on spectrum acquired from 8th auction onwards, doing away with mandatory up-front payments, ability to surrender spectrum after a minimum threshold period (10 years), easy payment options like increased number of annual installments (20 annual installments), option for moratorium on past dues etc. has contributed to successful spectrum auction. Spectrum is very critical for telecom connectivity and with better availability of spectrum to Telecom Service providers, the quality of services is also expected to improve.

- ii. Launch of 5G Services: 5G services were launched in India by the Hon'ble Prime Minister on 1st October 2022. 5G use cases developed by Telecom Service Providers and start-ups in Education, Health, Worker safety, Smart agriculture etc. are now being deployed across the country.



Hon'ble Prime Minister, Shri Narendra Modi launched 5G services at the India Mobile Congress (IMC) 2022. The inauguration session was also graced by Shri Ashwini Vaishnaw, Hon'ble Minister for Communications, Shri Devusinh Chauhan Hon'ble Minister of State for Communications and Shri K Rajaraman, Secretary Department of Telecommunications.

- iii. Indigenous 5G Test Bed: Keeping in view India's specific requirements and to take lead in 5G deployment, Department of Telecommunications (DOT) approved financial grant for multi-institute collaborative project to set up 'Indigenous 5G Test Bed' in at five locations viz. Integrated Test Bed at CEWiT/IIT Madras, IIT Delhi, IIT Hyderabad, IIT Kanpur and IISc Bangalore.

The Indigenous 5G Test bed was dedicated to the nation by Hon'ble Prime Minister on May 17th 2022.

Indian academia and industry can use the Indigenous 5G Test Bed to validate products, prototypes, algorithms, and services. As India becomes self-sufficient in 5G Technology, the development of this Indigenous Test Bed is a crucial step towards 5G Aatamnirbhar Bharat.

- iv. Permission to Telecom Service providers (TSPs) for conducting 5G Trials: The Department of Telecommunications has granted permissions to TSPs like M/s Bharti Airtel Ltd., M/s Reliance Jio Infocomm Ltd., M/s Vodafone Idea Ltd. and M/s MTNL for conducting 5G Technology trials with India specific use cases. TSPs have made significant progress in deploying 5G trial network and demonstrated some of the indigenous use-cases, including those generated by 5G Hackathon organized by DoT. They have also signed an Agreement with some of the indigenous 5G technology members for moving ahead for use-case trials. This augurs well for Start-ups/SMEs/Academia and will strengthen the 5G ecosystem in India.
- v. Setting up of 5G Use Case Labs: DoT has set up Inter-Ministerial Committee for setting up of India specific Use Case labs in different economic verticals like Education, Healthcare, Agriculture, Public safety, Fin Tech etc.

IDRBT has identified Fifteen entities for potential use case development, out of 56 based on Hackathon conducted broadly in the areas of customer self-service, collaboration between BFS and telcos, NG-branches, and field staff enablement. IDRBT is also working with banks and start-ups to pilot the use cases. A broad range of technologies are being leveraged for the use cases, including AR/VR/MR, Cloud & MEC, Computer Vision, Wearables, Haptics, Humanoids, IoT, Drones, AI / ML, and DLT.

- vi. 5G Hackathon- Application Development: 5G Hackathon was launched with the objective to identify and promote applications, relevant to India in different categories like Healthcare, education & governance, Banking, finance and insurance/ Cyber Security/ Enterprise transformation, Industry 4.0, Agritech & Livestock and Smart cities & infrastructure etc, in the 5G realm, which will be developed into workable products/ solutions. This year from Phase 3, out of 30 winners 27 have developed their products. Based on evaluation DoT has short listed 3 top winners for award of Rs. 10 Lakh each. With 5G Hackathon, DoT has been able to develop 56 applications/Use cases in 5G technology.

2.1.2 Indian Telecom Scenario

- i. Increase in Telephone Subscription:
 - a) Total telephone connections rose to 117.02 crore in October 2022 from 93.30 crore

in March 2014, with a growth of 25.42 %. The number of mobile connections reached to 114.4 crore in October 2022. The tele-density which was 75.23% in March 2014 has reached 84.67% in October 2022.

- b) Urban telephone connections rose to 64.99 crores in October 2022 from 55.52 crore in March 2014, a growth of 17.06% while the growth in rural telephone connections was 37.69%, which is double of urban increase, rising from 37.78 crore in March 2014 to 52.02 crores in October 2022. The rural tele-density jumped from 44% in March 2014 to 57.91% in October 2022.

ii. Jump in Internet and broadband penetration:

- a) Internet connections jumped from 25.15 crore in March 2014 to 83.69 crore in June 2022, registering a growth of 232%.
- b) Broadband connections rose from 6.1 crore in March 2014 to 81.62 crores in September, 2022 growing by 1238%.
- c) Average revenue realization per subscriber per GB wireless data reduced to Rs. 10.29 in June, 2022 from Rs. 268.97 in December 2014, a reduction of more than 96.17%.
- d) Average monthly data consumption per wireless data subscriber increased by 266 times to 16.40 GB in June, 2022 from 61.66 MB in March 2014.

iii. FTTH

- a) FTTH Broadband subscribers per 1000 HH for Rural is 15.05, Urban is 241.20 and Total is 85.03 as on August, 22.
- b) FTTH state wise data shows that Delhi has highest FTTH per 1000 household (654.53) as on August,22.

iv. BTS and Towers:

- a) The number of Mobile Base Transceiver Stations (BTS) are 23.98 lakhs as on 09.12.2022.
- b) The number of mobile towers are 7.4 lakh as on 09.12.2022.

2.2 NATIONAL DIGITAL COMMUNICATIONS POLICY-2018

The National Digital Communications Policy-2018 was launched by the Government of India in 2018 with a vision to fulfill 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, AI, 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. 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 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 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 Indian Telegraph Right of Way (Amendment) Rules, 2022

The Indian Telegraph Right of Way (Amendment) Rules, 2022 will facilitate faster and easier deployment of telegraph infrastructure for enabling speedy 5G roll-out. These amended rules, inter-alia, incorporate provisions for usage of street furniture for installation of small cells and telegraph line. Fees and charges for seeking RoW permissions by the Telecom Service Providers (TSPs) and Infrastructure Providers (IP) have also been rationalized to bring uniformity across the country.

2.3.2 Wireless Planning and Coordination (WPC) Reforms

The Government has brought the following procedural reforms on Wireless Licensing:

- i. Delicensing of various frequency bands to promote innovation, manufacturing & export as under:
 - a) Spectrum in 865-868 MHz band delicensed for facilitating IoT and M2M, RFID etc. applications.
 - b) 9 KHz to 30 MHz band delicensed for contactless Inductive Charging etc.
 - c) 433-434.79 MHz band delicensed for various Short-Range Devices (SRD) applications.
- ii. The Government has also released National Frequency Allocation Plan 2022 which will give guidance to the users of the spectrum to plan their networks in accordance with relevant frequency and parameters provided therein.

2.3.3 Satellite Reforms

To propel growth and to accelerate provisioning of affordable services to the citizens in the fast-emerging area of satellite-based services, reforms have been undertaken to help in Ease-of-Doing-Business by limiting multiplicity of charges at different stages of rolling out satellite-based communication services.

Till now, the satellite usage has been mostly limited to static-use. The Government has enhanced the scope of the commercial VSAT license to enable the provisioning of User terminal station(s) on moving platform(s). These terminals can be:

- i. Vehicle-mounted "fully mobile" or

- ii. simply briefcase size portable “pause and move” type.

To simplify the existing processes, vital changes have been made for streamlining satellite-related clearance processes. This will considerably shrink the existing time taking process in spectrum assignment and associated clearance(s). Self-certification has been introduced in order to save time in operationalizing the networks.

2.3.4 Launch of “Gati Shakti Sanchar” Portal to Streamline the process of Right of Way (ROW) Applications and permissions Across the Country

Universal and equitable access to Broadband Services across the country, especially in the rural area is one of the most important visions of Hon’ble Prime Minister of India. To fulfil this vision, it is imperative that backbone of infrastructure is created by facilitating smooth and efficient deployment of Digital Communications Infrastructure across the country. The “GatiShakti Sanchar” portal for Centralised Right of Way (RoW) approvals is now functional with all 36 States/UTs onboard and is also integrated with Min. of Railways, MoRTH and MoD-DGMO.

The portal acts as an enabler for “Ease of doing business” for telecommunications infrastructure works. The timely disposal of RoW applications of various services and Infrastructure providers shall enable speedy infrastructure creation especially for timely rollout of 5G Network also. The portal will enable applicants from various Telecom Service Providers (TSPs) as well as Infrastructure providers (IPs) to apply at a common single portal for Right of Way permissions to lay down Optical Fiber Cable and for erecting mobile towers. As it smoothens the process of RoW permissions as well as faster approvals; it will facilitate easy rollout of 5G services. For effective monitoring of RoW applications across the country, the portal even comes fitted with a potent dashboard showing State and District wise pendency status.

2.3.5 PM GatiShakti National Master Plan Platform for 5G rollout

The Telecom assets are being mapped on PM GatiShakti NMP (National Master Plan) platform. So far ~ 10 Lakh Rkm (Route Kilometer) of OFC laid by PSUs viz. BSNL, BBNL, RailTel, GAIL, PowerGrid has been mapped. About 23 lakh BTS of all Telecom Service Providers (TSPs) have been mapped with details such as ‘fiberized’ and ‘non fiberized’.

The tool developed by BISAG on PM GatiShakti NMP calculates the required length and route of the nearest OFC to a particular unfiberized tower. This helps in:

- i. Fiberization of unfiberized towers i.e. for connecting the available nearest OFC with nearest unfiberized tower
- ii. PSUs having saleable OFC can easily showcase and sell their OFC.
- iii. Companies who want to explore the option of buying available OFC to connect their unfiberized towers can do so without much effort.

Further, the street furniture (like electricity poles, bus shelters, traffic lights etc.) laid by State Governments are being progressively mapped. The DoT NMP platform is being integrated with State NMP platforms so that various assets of States like street furniture, government lands etc.

are visible on the NMP DoT platform. Various tools on the NMP platform have been developed which will make 5G rollout easier for the TSPs. For example:

- i. Shortest Distance tool: This tool shows the distance of the nearest OFC from the point of interest which may be a non-fiberized mobile tower or a new site for a 5G cell/pole.
- ii. 5G planning tool: This tool generates grids of customizable size in a city of interest. By Overlapping the layer of street furniture & mobile towers, a TSP can see in which grid there is no asset for 5G pole installation and a new pole/infrastructure is required.
- iii. RoW(right of way) tool: Using this tool, a TSP can see which agencies like State local bodies falling under the route of OFC laying or mobile tower installation.

2.4 INITIATIVES

2.4.1 Design-Led Manufacturing Under Telecom PLI Scheme: On 17.02.2021 the “Production Linked Incentive Scheme for Telecom & Networking Products” was approved with an outlay of Rs.12,195 crores for a period of five years. The scheme provides 4 -7% incentives on sales of specified products. The Scheme has been formulated based on Production Linked Incentive Scheme under “Atma Nirbhar Bharat Abhiyan” for boosting domestic manufacturing and exports while attracting investments in the target segments of telecom and networking products in order to encourage “Make in India”.

Union Budget 2022-23 announced design led manufacturing for 5G products. It provided additional incentive of 1% over and above the existing incentives for products that are designed and manufactured in India. Accordingly, to facilitate design-led manufacturing of 5G products under PLI Scheme for telecom and networking products, the Department of Telecommunications has approved total 42 companies including 28MSMEs. Out of which 17 companies are approved for additional incentive of 1% under design-led manufacturing criteria. These 42 companies have committed investment of Rs.4,115 crores over scheme period. This is expected to generate additional sales of Rs.2.45 lakh crores of telecom and networking products and create additional employment of more than 44,000 over the scheme period.

2.4.2 Telecom Technology Development Fund (TTDF) Scheme: TTDF aims to fund R&D in rural-specific communication technology applications and form synergies among academia, start-ups, research institutes, and the industry to build and develop the telecom ecosystem. It also aims to promote technology ownership and indigenous manufacturing, create a culture of technology co-innovation, reduce imports, boost export opportunities and creation of Intellectual Property. It will help create the ecosystem for research, design, prototyping, use cases, pilots, and proof of concept testing, among others. The scheme entails grants to Indian entities to encourage and induct indigenous technologies tailor-made to meet domestic needs.

2.4.3 Revival Plan of MTNL and BSNL: The Union Cabinet in its meeting held on 27.07.2022 has approved the revival plan for MTNL & BSNL. The highlights of MTNL Revival package is as under:-

- i. Raising Sovereign Guarantee Bonds by MTNL with tenure of 10 years or more, for

an amount of Rs 17,571 Crores (Rs 10,910 Crores in FY 2022-23 and Rs 6,661 Crores in FY 2023-24) with waiver of guarantee fee, to repay the high cost debt and restructure it with new substantial loan. The principal/interest will be repaid by MTNL through the proceeds of rental/sale of land/building assets.

- ii. BSNL will provide all telecom services in Delhi and Mumbai through leasing of operational assets or other appropriate model. After taking over of operation by BSNL in Delhi/ Mumbai, MTNL would be left with land/building assets which it will continue to monetize to discharge its loan liabilities.
- iii. In view of unsustainable debt of MTNL, for further detail examination to resolve matters such as Asset monetization, AGR dues, debt resolution and further course of action for merger of MTNL with BSNL, a Committee of Secretaries (CoS) comprising of Secretary DoE, Secretary DoT, Secretary DIPAM and Secretary DPE has been constituted to recommend the way forward. Finance Minister and Minister of Communication have been empowered to decide the way forward. The Government will provide a budgetary support of Rs. 1600 Crores for restructuring and operational integration of the Telecom PSUs as a one-time grant.
- iv. Sanctioning of capex of Rs. 22,471 Cr (in FY 2022-23 & FY 23-24) as equity infusion in BSNL. This includes project requirement of MTNL of Rs. 1851 Cr in Delhi/Mumbai also.

2.4.4 Champion Service Sector Scheme: The umbrella scheme titled 'Champion Services Sector Scheme (CSSS)' is a Central Sector Scheme of the Department of Commerce. 'Communication Services' has been identified as one of these Champion Services Sectors and the Ministry of Communications has been identified as its Nodal Ministry. There are 2 sub-schemes of DoT (initially for a period of 3 years i.e. 2019-20 to 2021-22) under the umbrella CSSS.

- i. Brand building of India as Telecom Manufacturing and Services Destination: Branding India as a manufacturing hub, technology supplier and showcasing Make in India initiative. Funds are being utilized for subsidizing up to 90% participation cost by Indian telecom equipment and service providers in important national/international technology events/exhibitions.

Sub-scheme under CSSS	Proposals approved (Yr 2022-23)	Amount approved
Brand building of India as Telecom Manufacturing and Services Destination	Proposal for participation in 6 events/ exhibitions	Rs. 11.93 Cr.

- ii. Setting up of Digital Communication Innovation Square (DCIS): The scheme aims to promote and support translation of innovative ideas and knowledge in engineering derived from fundamental or applied research into pilot scale operation, field deployment or viable technology development (product or process) within a definite time frame.

Sub-scheme under CSSS	Proposals approved (Yr. 2022-23)	Amount approved
Digital Communication Innovation Square (DCIS)	Proposals for funding of 43 Startups/ MSMEs/ Consortiums	Rs. 51.56 Cr.

2.4.5 Transition to the Next Generation of Internet Protocol: Internet Protocol addresses, or IP addresses, are a core part of how the Internet operates. The proliferation of new technologies such as 5G, Machine to Machine Communication, Artificial Intelligence, etc. and thrust on digital initiatives by the GoI along with the penetration of broadband and internet services, has necessitated large number of Internet Protocol (IP) addresses, beyond the current available pool of IPv4 (IP version 4) addresses. To overcome this shortage, Internet Protocol version 6 (IPv6) was developed, which improves on the addressing capacities of IPv4 by using 128 bits address instead of 32 bits, thereby practically making available almost an infinite pool of IP addresses. IPv6 will provide enabling platform for Internet of Things (IoT)/ M2M Communications. The adoption of IPv6 based innovative applications in areas like smart metering, smart grid, smart building, smart cities etc. will keep improving the quality of life of common citizens

The Department of Telecommunications (DoT), has been constantly working with all stakeholders including ISPs/ Equipment Manufacturers/ Data Centre providers/ States/ UTs/ Central Ministries/ Departments for smooth transition to IPv6. As a result of the concerted efforts of the DoT and all stakeholders, the majority of the service providers in India have become ready to handle IPv6 traffic & offer IPv6 services. A large number of cloud service providers and equipment manufacturers have successfully deployed and used IPv6 for various innovative applications. A significant number of companies have also transitioned to IPv6-only service delivery. The National Digital Communications Policy (NDCP-2018) also envisages the transition to IPv6 for all the remaining communications systems, equipment, networks and devices.

The focused efforts of DoT has led to the timely adoption of IPv6 and provided the potential for innovative applications in different sectors. As per the latest information of Asia Pacific Network Information Centre (APNIC), India stands at 2nd position (out of more than 240 countries) with IPv6 capability ratio at 79.23%.

2.4.6 Establishment of Digital Intelligence Unit (DIU)

- i. With the objective of strengthening the trust in digital ecosystem, to mitigate the frauds involving telecom resources and to control the harassment of telecom subscribers, a Digital Intelligence Unit is created.
- ii. Digital Intelligence Unit (DIU) is a digital platform envisaged by DoT for detection and prevention of misuse of telecom resources in India. DIU has been conceptualized for the implementation of Big Data Analytics and Artificial Intelligence based solution to generate intelligence for uncovering the telecom related frauds in India.
- iii. DIU will create an integrated platform for Coordination with various Lawful Enforcement Agencies (LEAs) and Financial Institutions to assist them in investigation for fraudulent

activity involving telecom resources. It will also provide citizen centric telecom related information to telecom subscribers of India.

2.4.7 National Broadband Mission: The National Broadband Mission was launched by the Government of India on the 17th December, 2019 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.

2.4.8 Public procurement Preference to Make in India (PPP-MII): PPI-MII Portal for Telecom Products was inaugurated on 16th Nov, 2021. On this Portal, manufactures/vendors and other stakeholders can register their grievances and track the status of their complaints. The complaints received on the portal regarding Local Content in the locally supplied telecom goods, services or works are referred to the Committee constituted for complaints and independent verification of self-declarations and auditor's/accountant's certificates on random basis.

2.4.9 Development of Online License Management System of DoT: A web-based portal, "SARAL SANCHAR" (Simplified Application for Registration and Licenses) for issuing various types of Licenses and Registration Certificates has been developed by the Department of Telecommunications. The portal has helped in reducing the compliance burden on the citizens/applicants and in implementing the Digital India Vision of the Govt. of India. Currently, it handles applications for:

- i. UL/UL-VNO Licenses
- ii. WPC Licenses and approvals - Network and Non-Network Licences, Satellite Licences, AMSL, MMSL, USR, ETA, Import, SACFA, Experimental Licenses, Proficiency Certificates and Exams (RTR, GMDSS and HAM)
- iii. PM-WANI registrations
- iv. M2M Service Provider and WPAN/WLAN Connectivity Provider registrations
- v. Licensing framework for Satellite based connectivity for low bit-rate applications
- vi. CNPN License, IFMC permissions, IP-1 registrations etc.

Apart from the above, SaralSanchar portal is also integrated with National Single Window System (NSWS), BharatKosh, MCA-21 and NIC e-office to enable smooth filing, payment and processing of applications. This has caused reduction in application processing time.

2.4.10 Launch of Bharat Digicom Innovation Portal:

DOT alongwith TCoE (Telecom Centre of Excellence) is working on the development of Bharat Digicom Portal to promote the vibrant ecosystem of digital communication technologies and applications in India. It is intended to bring various stakeholders together for synergetic engagement and collaboration with updates on opportunities. The portal attempts to enable stakeholders (Academia, Startups/MSMEs, CoEs, Technical Experts, Government departments etc.) as a single point engagement platform. The portal may be accessed through the following link: <https://bharatdigicom.in>

2.4.11 Synergy Initiatives

Structured initiatives have been taken to bring synergy among the various organizations of DOT including – but not limited to - the Telecom PSUs and their subsidiaries, autonomous bodies and department offices. The focus of these initiatives is two-fold: (a) to maximise the productivity of the respective organisations, and (b) optimum utilization of resources and strengths available within the government set-up. Of late, the mandate of these initiatives is gradually being expanded to cover the synergy with domestic private sector players to the extent desirable.

The significant achievements under Synergy Initiatives are as follows:

- i. Transfer of Technology (ToT) Agreements signed by C-DOT with ITI for manufacturing of following Indigenous Technology Products:
 - a) Wi-Fi 6 Access point (Indoor)
 - b) Wi-Fi 6 Access point (IP67) (Outdoor)
 - c) Dual Band Outdoor Access (DOA) Wi-Fi 5 (Outdoor)
 - d) Wireless Gateway Router (WGR) Wi-Fi 5 (Outdoor)
 - e) Wireless Gateway Router (WGR) Wi-Fi 5 (Indoor)
 - f) Enterprise Access Point (EAP) Wi-Fi 5 (Indoor)
 - g) Stackable Terabit Branch Router (STBR)
- ii. To give a fillip to '*Atmanirbhar Bharat*', ITI has ventured into the manufacturing of 4G RAN equipment with homegrown technologies, and has signed an MoU with C-DOT for manufacturing of indigenous 4G RAN.
- iii. BSNL has placed an order for Proof of Concept (POC) of 4G eNodeB and 5G gNodeB on ITI.
- iv. Based on the recommendations of C-DOT, RailTel has placed an order on ITI for supplying 40,000 ONT-23 - as a TOT partner of C-DOT.
- v. C-DOT has got Essential Requirement (ER) Certification issued from TEC under Mandatory Testing and Certification of Telecom Equipment as notified vide Indian Telegraph (Amendment) Rules, 2017.
- vi. TCIL, in collaboration with C-DOT, has started POC of C-DOT Routers in BSNL Network.

2.4.12 Sanchar Kaushal Initiatives

- i. Skill development Unit under Department of Telecom, Ministry of Communications is responsible for promoting the Skill Development in the entire Telecom Sector across the country, to develop world class skilled manpower to address the futuristic and digital opportunities for the telecom Industry and enhance employability of the skilled workforce.

Qualification Packs (QPs) define the set of National Occupational Standards (NOSs) for a Job Role. NOSs specify the standard of performance, knowledge and understanding when carrying out a particular activity in the workplace. A Qualification Pack aligned to National Skill Qualification Framework (NSQF) drives both the creation of a course, curriculum & content, and assessments. Thus, NSQF makes it possible to drive competency/ outcome-based training and assessment for every job role in industry.

Thirteen Qualification Packs (QPs) for various job roles in 5G and allied technologies have been approved by National Council of Vocational Education and Training (NCVET) on the recommendation of DoT. These were developed by Telecom Sector Skill Council with due industry consultation.

S. No.	Qualification Code	Qualification Title	NSQF Level
1	2022/TEL/TSSC/06066	Jr. Technician - Last Mile Active Network	3
2	2022/TEL/TSSC/06065	AI Devices Installation operator	3
3	2022/TEL/TSSC/05791	Telecom Rigger - 5G and Legacy Networks	3
4	2022/TEL/TSSC/06067	IoT Technical Service Operator (4 Elective- Smart City, Agriculture, Telemedicine, Transport)	3
5	2022/TEL/TSSC/06068	Drone Monitoring and Maintenance Associate	3
6	2022/TEL/TSSC/05792	Infrastructure Technician – 5G Networks	4
7	2022/TEL/TSSC/05793	5G Technician – Active Network Installation	4
8	2022/TEL/TSSC/06070	Cloud Computing – Jr. Analyst	4
9	2022/TEL/TSSC/06069	AI &ML –Jr. Telecom Data Analyst	4
10	2022/TEL/TSSC/06072	IoT Installation Solution Architect	5
11	2022/TEL/TSSC/05794	Project Engineer – 5G Networks	5
12	2022/TEL/TSSC/06071	Machine Learning (ML) Engineer	5
13	2022/TEL/TSSC/05795	System Architect - 5G Cloud RAN	6

- ii. A Roundtable was organized on 20-10-2022 with Members from Telecom Industry/ Associations, Department of Higher Education, Ministry of Skill Development & Entrepreneurship (MSDE), AICTE, Sector Skill Councils (TSSC &ESSC) on Executive and Worker Skill requirements in next 2 to 3 years in Telecom Manufacturing and 5G/ 5G related services.
- iii. A stake holder session was held on 23-11-2022 with top recruiters (Team lease & NBL) and TSSC to assess the demand-supply gap of skilled manpower to properly support and harness the benefit arising due to 5G Technology.
- iv. A workshop in collaboration with IIT Madras, AICTE and TSSC was held for all State Skill

Development Missions & Directorate of Technical Education on 5G skill development on 6th Dec 2022 with the objective to orient and sensitize the participants on requirement of skill development courses on emerging job roles in 5G and in 5G enabled services.

- v. AICTE included an elective/ micro specialization course on 5G in Model curriculum for UG degree on the request of DoT.
- vi. Pandit Deendayal Upadhyaya Telecom Skill Excellence Awards have been instituted by Department of Telecommunications, Ministry of Communications, to encourage and stimulate/ inspire Telecom Skill ecosystem by rewarding the successful telecom skilled people and institutions of India annually for their exemplary and outstanding contributions in the areas of Telecom Skilling, Telecom Services, Telecom Manufacturing, Telecom Applications in deploying telecom dependent sectoral solutions for different fields such as agriculture, commerce, health, education etc.

2.4.13 M2M Service Provider and WPAN/WLAN Connectivity Providers Registration: In order to strengthen the M2M eco-system and to facilitate wider proliferation and innovation in the M2M/IoT sector, DoT had issued guidelines for Registration of M2MSP Service Providers and WPAN/WLAN Connectivity Providers on 08.02.2022 and commenced the process of on-boarding the M2M Service Providers through a simple online registration process on DoT's SARAL SANCHAR portal. This registration would help M2M Service Providers to boost their business globally, as registration will provide them recognition as a registered entity with Government of India. This registration would also facilitate Government to gather information on the various use cases of M2M/IoT being developed by the M2MSPs and help in adoption of one M2M standards-based deployments in the country. As on 22.12.2022, 128 entities have registered with DoT for providing M2M services.

2.5 GRANT OF LICENSES

2.5.1 Access Service: Facilitating licensees right from grant of licenses for multiple services to allocation of number resources to navigating complete life-cycle during the license period. It plays a significant role in finalizing the National Telecommunication Policies, legal framework for communication sector, developing Rules and Regulations, and Spectrum Management policies in the Department. Key milestone and achievements under AS are summarised below.

- i. Number of Access Service Providers – Unified Licenses -190 and Unified Licenses (VNO) – 490 as on 11th November, 2022.
- ii. Number of Flight and Maritime Connectivity (IFMC) Service Authorizations – 22 as on 11th November, 2022.
- iii. Number of Captive Non-Public Network Providers – 1 as on 11th November, 2022.
- iv. To enable the policy framework for CNPN, following actions have been taken by DoT:
 - a. Guidelines for Spectrum leasing by Access Service Licensees to CNPN issued on 27.06.2022.

- b. License Amendments issued on 27.06.2022 for enabling the Access Service Licensees to provide CNPN as a service and spectrum on lease to CNPN licensees.
- c. Guidelines for grant of CNPN license issued on 27.06.2022.
- v. Reduction of compliance burden on TSPs by issuing amendment in License for change in FDI compliance report: For reducing compliance burden on TSPs, various initiatives have been taken. One of such initiatives is reduction in frequency of submission of compliance of report in FDI. Earlier, the licensees were required to submit the FDI compliance report twice in a year i.e., by 1st of January & 1st of July of every year. On 02.08.2022, the Department issued amendments in telecom licenses and made submission of compliance report once a year i.e., by 1st January of every year.
- vi. Reducing compliance burden on TSPs by revision of EMF audit testing conducted by LSA field units of DoT: Earlier LSA field units have to test annually upto 10% of the total BTS sites (new and existing sites) for EMF audit. On 03.11.2022, the Department issued instructions vide which LSA field units will now test annually up to 5% of the total BTS sites (new and existing sites) randomly at their discretion.
- vii. Removal of restriction on telecom connectivity near International Border Areas for better coverage and connectivity: Telecom connectivity is the basic requirement for socio-economic development. In this era of advance digital technology, where online services have made many services accessible to the common person, there is a need to have good telecom connectivity to ensure socio-economic development of the people living near the International Border Areas. In order to have better coverage and connectivity at International border areas, in consultation with Ministry of Defense and Ministry of Home Affairs, the DoT has issued amendment to the Licenses on 23.08.2022 for removing restriction on telecom connectivity near International border areas.
- viii. Criterion for allocation of 13-digit Machine-to- Machine numbering allocation were defined on the basis of the committee report submitted for defining the procedure and criterion of allocation of 13-digit Machine-to- Machine numbering resources.
- ix. Allocation criterion for wire-line numbering resources has been revised to promote fixed line broadband and to provide numbering resources for fixed line.
- x. Allocation of approximately 44 short codes/ Helpline numbers to various Central/ State Government agencies for public services such as:
 - a. Allocation of short code 14544 to Prohibition, Excise and registration Department of Bihar a helpline to receive feedback and addressing grievances of citizens.

- b. Allocation of Short code 14416 as National Tele-Mental Health Programme to Ministry of Health and Family Welfare, Govt. of India for all States/UTs to provide universal access to equitable, accessible, affordable and quality mental health care.
 - c. Allocation of Short code '14413' to National Health Authority, Govt. of India to address the concerns of EHCPs (Empanelled Health Care Providers) to provide suitable support.
 - d. Allocation of short code '14448' for establishing a Helpline Centre for common public to get information about the Alternate Grievance Redressal Mechanism of RBI and information about their complaints against RBI regulated entities.
- xi. Grant of approval for discontinuation of 3G services in various LSAs of M/s Vodafone Idea Limited.
 - xii. Coordination with various States/UTs, MHA and Telecom Service Providers for successful implementation of Single Emergency Response based Emergency Response Support System.
 - xiii. Ease of doing business has been facilitated by taking major initiatives related to rollout of telecom network such as:
 - a. Release of multiple PBGs.
 - b. Simplification of rollout obligation conditions.
 - c. Integrating rollout obligations progress into the unified Saral Sanchar portal.
 - xiv. IVRS Platform for call drop feedback: In order to obtain direct feedback on call drop from subscribers, DoT had launched an Interactive Voice Response System (IVRS) in December 2016 wherein around 6.32 crore subscribers have been individually contacted out of which 77.14 lakh subscribers have participated in the survey upto October-2022. The feedback is shared with respective Telecom Service Providers (TSPs) for taking corrective action in a time bound manner. As a result, about 1.78 lakh individual cases of call drops have been resolved and around 8,254 Base Transceiver Stations (BTSs) have been installed by the TSPs, to resolve the call drops issues received through IVRS upto October-2022.

2.5.2 Data Service

- i. Number of Licences issued for Providing Internet service as on 31.12.22 are 2779.
 - a) 99 ISP Licences for various Categories have been issued. This includes 34 Category "A" ISP authorization and 65 Category "B" ISP authorization.
 - b) 1982 Unified Licenses with ISP authorization for various Categories have been issued. This includes 71 Category "A" ISP authorization, 676 Category "B" ISP

authorization, 1235 Category “C” ISP authorization.

- c) 698 Unified Licenses (VNO) with ISP authorization have been issued which include 63 Category “A” authorizations, 483 Category “B” authorizations and 152 Category “C” authorizations.
- ii. Reducing compliance burden: With an aim to achieve ease of doing business, Government launched an ambitious campaign to reduce compliance burden by simplifying Government to Business interfaces. Some of the key initiatives undertaken by during the exercise in respect of ISP Licensees are as under:
 - a) ISPs have been asked to submit compliances / reports online via Saral Sanchar portal.
 - b) The number of inspections have been reduced for Class B & C License to once in two and three years respectively.
 - c) Network elements which are catering to more than one LSA be tested/inspected as per the inspection schedule of the Licensee by the LSA where the said network element is located.
 - d) It has been clarified that inspection of network of downstream ISP by upstream ISP is not required.

2.5.3 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, has approved 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. Under the PM WANI framework, online registrations of PDOAs and App providers began on 07.01.2021.

As on 19.01.23, a total of 146 PDOAs and 88 App Providers have been registered with Central registry and total number of 137182 Access Points have been deployed by PDOAs.



Inauguration of First PM WANI access point in Gonda in Uttar Pradesh State and PM-WANI Awareness Workshop attended by Fair Price Shop keepers

2.5.4 Satellite Service

- i. Major decisions taken by the Digital Communications Commission - Recommendations made by TRAI on 'Licensing framework for Satellite based connectivity for low bit-rate applications'. The main features of these are:
 - a) For provision of satellite-based connectivity for IoT and low-bit-rate applications, the relevant service licensees may provide connectivity as per the scope of their authorisation for any kind of network topology model including hybrid model, aggregator model and direct-to-satellite model.
 - b) Provisioning of VSAT services through user terminal stations on moving platform.
 - c) Scope of authorizations of GMPCS service, Commercial VSAT CUG service and NLD service under Unified License and Captive VSAT CUG service license may be suitably amended to include the provision of satellite-based low-bit-rate connectivity for IoT devices.
 - d) Removal of NOCC charges.
- ii. Liberalisation of Satellite based Communication services under Unified License.
 - a) Satellite Communication Reforms-2022 have been unveiled on 26th Oct 2022 by Hon'ble MOC wherein to propel growth and accelerate the provisioning of affordable services to the citizens, the Government has taken the following steps:
 1. NOCC charges of Rs 21 Lakh per transponder per year removed for Satellite TV Broadcasters w.e.f. 1st Oct, 2022. Such charges for telecom operators have already been removed a few months back.

2. Mandatory Performance Verification Testing (MPVT) charges of Rs. 6000/- per antenna for testing of satellite antenna(s) removed.

This will help in Ease-of-Doing-Business by limiting multiplicity of charges at different stages of rolling out satellite-based communication services.

3. The scope of the commercial VSAT license has been enhanced to enable the provisioning of User terminal station(s) on moving platform(s). These terminals can be:

- Vehicle-mounted “**fully mobile**” or
- or simply - briefcase size portable “**pause and move**” use.

4. To simplify the existing processes, vital changes have been made for streamlining satellite-related clearance processes.

- Instead of multiple-level scrutiny by NOCC and WPC, single scrutiny by each unit is envisaged for Ease-of-Doing-Business.
- The per-site clearance of WOL for user side VSATs has been done away with for VSAT operators.
- Instead of physical testing of satellite antenna(s) by NOCC, provision has been made for self-certification for antenna and generation of automatic up-linking permission online.
- For ease of understanding of stakeholders, DoT has issued Guidelines - 2022 for Establishing satellite-based communication network.

- b) In addition, the Government has taken following steps during last year to boost satellite based communication services in India:

1. Enhancement of scope of Commercial and Captive VSAT licenses, GMPCS license to enable satellite-based M2M/IoT devices.
2. Enhancement of scope of Commercial VSAT license allowing service providers to provide Backhaul through VSAT for cellular mobile service and Wi-Fi services. This will accelerate roll out of cellular and wi-fi services to the remotest parts of the country.
3. The data speed restrictions for different types of satellite based telecom network deployments have been done away with, thereby enabling deployment of faster throughput networks.

iii. Satellite Services

- a) Satellite communication is increasingly playing an important and pivotal role in connecting the unconnected areas and bridging the digital divide. It is going to bring transformative improvements in the areas of transport, logistics, agriculture, forestry,

disaster management, telemedicine, and tele-education, etc. Further, India's hopes to be at the forefront in an increasingly digital future by harnessing frontier technologies such as artificial intelligence (AI), robotics, and augmented reality/virtual reality (AR/VR) ride on ubiquitous, robust and multi-modal connectivity using satellite based communications network especially for far flung, non-accessible and difficult terrain areas.

- b) Satellite licenses for following services are granted:
1. VSAT CUG Services: VSAT service Licenses are granted on non-exclusive basis for Very Small Aperture Terminal (VSAT) service using satellite system within the territorial boundaries of India. Under the VSAT license, the Licensees provide data connectivity within CUG amongst various sites scattered throughout India using VSATs and central hub. There are two categories of VSAT licenses:
 - Commercial VSAT CUG service authorization under Unified License wherein the licensee company can provide VSAT CUG service to users on commercial basis. As on 30th November, 2022, there are 8 (Eight) Licenses for providing commercial VSAT services. In addition, 5 (Five) VNO licenses for commercial VSAT services licenses have also been issued.
 - Captive VSAT CUG License wherein the licensee company can set up VSAT network for its internal use only. As on 30th November, 2022, there are 26 captive CUG VSAT networks.
 2. Global Mobile Personal Communication by Satellite (GMPCS): The Licensee may provide all types of mobile services including voice and non-voice messages, data services. As on 30th November, 2022, there are 2 (Two) Licenses for providing GMPCS services.

The Department of Telecommunications (DOT) has also granted a license under sui-generis category to BSNL for "Provision & operation of Satellite based services using gateway installed in India". BSNL has installed the Gateway at Ghaziabad and has started giving Global Satellite Phone Service (GSPS) w.e.f. 24.05.2017.

2.5.5 Carrier Services

- i. Audio Conferencing/ Audiotex/ Voice Mail Services

A new "Licensing framework for Audio Conferencing/ Audiotex/ Voice Mail Services under Unified License" and amendments in the terms and conditions of the existing standalone license of "Voice Mail Service (VMS)/ Audiotex (ATS)/ Unified Messaging Services (UMS)" were issued by the department effective from 01st January 2022. As per the Recommendations of TRAI on "Licensing framework for Audio Conferencing/Audiotex/ Voice Mail Services", DoT had decided to make this license a part of the Unified License (UL) by

adding a new Chapter for this authorisation. However, the migration from existing license to Unified license was kept optional for existing licensees holding VMS/ Audiotex/ UMS license. The existing licensees have started migrating to the new licensing regime under Unified License. The industry has appreciated this initiative as there are a number of advantages in the new licensing regime.

ii. Audio-conferencing/ Audiotex/ Voicemail Service.

License for Voicemail/ Audiotex/ Unified Messaging Service was issued for the Service Area of Short Distance Charging Area (SDCA). W.e.f. 01.01.2022, new licenses under Unified License (UL) with authorization for Audio Conferencing/Audiotex/Voice Mail are being issued. As on 31.12.2022, there are 51 licenses of VMS/Audiotex/UMS with 22 companies (under old regime) and 5 authorisations of ACS/Audiotex/VMS under UL with 5 companies (i.e. under new regime).

iii. Public Mobile Radio Trunking Service (PMRTS)

PMRTS is a two-way land mobile service in which the users communicate among themselves through a pair of Radio frequencies out of a pool in a designated frequency band, assigned to the system. This license is used to provide Public Mobile Radio Trunking Service on commercial basis. PMRTS license comes under Unified license since 01.08.2013 and is being issued for commercial use. Service area for PMRTS is Metro or Circle-wise. As on 31.12.2022, there are 82 UL-PMRTS and 68 PMRTS (VNO) authorizations and 1 Stand-alone PMRTS licenses issued to provide PMRTS service in the country.

iv. Captive Mobile Radio Trunking Service (CMRTS)

CMRTS is similar to PMRTS service, and the only difference is that it is used for captive purpose, unlike PMRTS which is used on commercial basis. CMRTS license is not covered under Unified license, and is issued by DoT for Captive use only to the agencies/ companies like police, metro rail service, mining etc. Service area for CMRTS is Metro/ city/specific area/location. As on 31.12.2022, there are 117 CMRTS licenses issued to provide CMRTS service.

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. As on 31.12.2022, 32 ILD Licenses (Standalone licenses & UL authorisation) and 10 ILD service authorisation under UL(VNO) have been issued.

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. During 2022-23 (till 31.12.2022), clearances have been given for 06 no. of ILD gateways, 02 no. of CLS and 02 no. of RA approvals have been granted.

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. During 2022-23 (till 31.12.2022), 32 MHA clearances covering 4966 personnel and 25 MoD clearances covering 59 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. As on 31.12.2022, 46 NLD Licenses (Standalone licenses & UL authorisation) and 14 NLD service authorisation under UL(VNO) have been issued.

viii. 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. As on 31.12.2022, 1371 companies have been registered as Infrastructure Provider Category-I.

2.6 TELECOM SECURITY

2.6.1 The emerging new trends in telecom security requires policy intervention and guidelines for securing telecom networks, monitoring and enforcement, thereof, through Security Assurance and Security-Policy, Planning & Intelligence (SPPI).

2.6.2 Security Policy, Planning and Intelligence (SPPI) Wing is responsible for the policy guidelines & framework with respect to security and for interfacing with the law enforcing agencies for telecom related support on security aspects. Facilitating Lawful interception and monitoring of communication messages by Law Enforcement Agencies under section 5(2) of Indian Telegraph Act, administering rules related to lawful interception, e.g. Rule 419A of the Indian telegraph Rules 1951, SOP for TSPs on lawful interception. Matters related to Call Detail Records (CDR), Location Based Service, CLIR, illegal telecom setups, obtaining CDR by Security Agencies, framing Rule 419B, identification of vital installations, secured and dedicated communication network etc. are handled by SPPI Wing. SPPI also coordinates with Cyber Diplomacy Division of MEA and participation in Joint Working Group (JWG)/ Bilateral cyber dialogs with other Nations.

2.6.3 Security Assurance-II Wing looks after the operationalization of projects to take care of Security of Communications in the telecommunication network. This is achieved by undertaking the research & development of telecommunication Security products and systems, 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.

2.6.4 The prevention of tampering of the Mobile Device Equipment Identification Number (Amendment) Rules, 2022: These rules have been published in the Gazette of India on 26.09.2022. Under these rules, (i) the manufacturer is to register IMEI number of every mobile phone manufactured in India with the Indian Counterfeited Device Restriction (ICDR) portal (<https://icdr.ceir.gov.in>) of the Department of Telecommunications prior to the first sale of the mobile phone with effect from January 1, 2023 and (ii) the IMEI number of the mobile phone imported in India for sale, testing, research or any other purpose is to be registered by the importer with the ICDR portal prior to import of mobile phone into the country with effect from date of publication of the rules in the official Gazette. Central Equipment Identity Register (CEIR) system to facilitate blocking and tracing of lost or stolen mobile phones is now available in Mumbai, Maharashtra, Delhi, Karnataka and North East LSAs

In order to bring uniformity in the Security policy of the TSPs, the minimum Requirements of Security policy (MRSP) document has been issued to all the TSPs. In coordination to MRSP, the SOP for guiding the conduct of cross check Security Audit by the LSA field units of DoT in the form of minimum Baseline Security Standard (MBSS) document has been issued.

2.6.5 Computer Security Incident Response Team (CSIRT) is a team comprising of experts and supported through orders, instructions, policy guidelines to the stakeholders enabling it to perform, coordinate and support the response to a security incident within a defined constituency. A CSIRT for telecommunication sector of India designated as Telecom-CSIRT (T-CSIRT). The framework of T-CSIRT has been issued. The advisory committee in the framework consists of representatives from various Ministries, Telecom Service Providers and academia.

2.6.6 National Trust Center: Increased penetration of affordable devices, combined with cloud computing, analytics and rising consumer expectations has been driving the rapid growth of the IoT market. With such a profound increase in IOT devices securing the users is utmost important. In order to bring trust in the IoT ecosystem C-DOT is working towards National Trust Center (NTC).

The objectives of NTC are:

- i. A central registry of M2M/IoT Service Providers, Connected Devices and Trusted Applications
- ii. Integrate NTC with the certificate/ key management framework of the Telecom and Network Service Providers and that of the Controller of Certifying Authority (CCA).
- iii. Interwork with national sectoral registries (such as Vahan for vehicles, Energy sector repository for Smart Meters, etc.)
- iv. Interwork with registrars in other countries for exchange of threats and vulnerabilities in the IoT ecosystem.
- v. Interface with MTCTE portal

2.6.7 DoT has designed and implemented ASTR_- AI and Facial Recognition powered Solution

for Telecom SIM Subscriber Verification. The pilot project was launched in Mewat, Haryana and approximately 5 lakh SIMs which were found to be issued on fake/forged documents, have been disconnected in last 6 months. Under the initiative, 100% SIM subscriber verification of Mewat Region, Haryana has been carried out. This was a first of a kind initiative launched anywhere in the country. MHA in coordination with DoT have prepared a list of hotspots from where fake/forged/pre-activated SIMs are being sold. DoT has launched the operation of 100% SIM subscriber verification in the hotspots. 100% SIM subscriber verification has been completed in Jammu and Kashmir LSA. Approximately 14,000 SIMs have been found to be issued on fake/forged documents. All the SIMs have been disconnected.

2.7 FINANCIAL MATTERS

2.7.1 Asset Management:

Asset Management (AM) Division is responsible for preparation as well as monitoring of overall asset management policy in respect of Department of Telecom and related offices as well as Public Sector Undertakings (PSUs) under the administrative control of DoT. Asset Management Division deals with the work of overall monitoring of the land and building assets, inventory management and related valuations. It also deals with the finalization of policy regarding schedule of accommodation and standards of staff quarters.

The Division deals with the asset cases requiring approval of the President in accordance with the Memorandum of Association (MoA) and Article of Association (AoA) of PSUs, handling the work of inter-departmental/inter-ministerial transfer as well as acquisition of land and buildings, retention of land and buildings for DoT Units and other Government offices, management of joint held properties, monitors the work of verification of DoT assets and related matter of schedule of accommodation in respect of DoT field units. It also deals with Work relating to approval of lease/renting of office space/staff quarters as well as estimates for repair/renovation/construction of buildings for DoT and its field offices.

This wing also deals with uploading and monitoring of data on Government Land Information System (GLIS) portal relating to the land and building under the DoT. Asset Management Division is also responsible for preparation, monitoring and compilation of Asset Register as per format prescribed by Ministry of Finance communicated by Controller General of Accounts(CGA).

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 2022-23: -

- i. Preparation and Updation of Asset Register for DoT Assets (Land & Buildings). (Target Completed)
- ii. Updation of all land records in GLIS (Govt. Land Information System) portal for DoT HQ, field units, attached offices, Statutory bodies including PSUs and Autonomous Bodies. The details are shown in (Target Completed)

Consolidated Land Data details of DoT uploaded in GLIS portal*

Sr. No.	Organisation	Type of Organisation	Land data uploaded Nos. of Land parcels	Measurement (in sq.mtrs.)
1	DoT HQ.	HQ.	1	11175
2	TRAI	Statutory Body	Nil	---
3	TDSAT		Nil	---
4	USOF	Attached Office	Nil	---
5	TEC		1	3010.05
6	CGCA		Nil	---
7	DGT		Nil	---
8	WMO	Subordinate Office	21	2288495.41
9	NTIPRIT		1	327795.37
10	NCCS		Nil	---
11	NICF		1	215737.92
12	NOCC		2	182215.94
13	CCA	Field Units	11	97868.31
14	LSA		1	650.32
15	C-DoT	Autonomous Bodies	1	160000
16	BSNL	PSUs	15560	45470000
17	MTNL		227	1440000
18	ITI		14	5590000
19	TCIL		—	—
20	BBNL		-	—
		Total	15841	53498452.91

*Data as on 25.11.2022

- iii. Updation of all building records in GLIS portal of DoT HQ., field units, attached offices, Statutory bodies including PSUs and Autonomous Bodies. (Likely to be completed by March-2023)
- iv. Monetisation of Core Assets on PPP mode with the appraisal of PPPAC and approval of competent Authority. (Appraisal is likely to be completed by March-2023)
- v. Monetisation of Non-Core Assets (Land and Building) of BSNL and MTNL. (Ongoing process)

2.7.2 Policy Matters::

- i. Rationalizing Definition of Gross Revenue/ Adjusted Gross Revenue (AGR)

Vide amendment dated 25.10.2021 the definition and methodology for computation of Adjusted Gross Revenue has been changed by introducing the concept of Applicable Gross Revenue (ApGR) to be arrived at by deducting the revenue from non-telecom activities, revenue earned from activities under a license/permission granted by Ministry of Information and Broadcasting, receipts from USO Fund and items of other income from Gross Revenue etc.

The definition and methodology for computation of Adjusted Gross Revenue has been amended based on the TRAI recommendations dated 06.01.2015. The changes in definition of AGR will be applicable to all existing Licensees for period of operations falling after October 1, 2021.

ii. Rationalizing Bank Guarantees (BGs) requirements

This reform aims at rationalizing the Bank Guarantee to be submitted by Telecom Service Providers under the License Agreement. The amount of FBGs held by DoT against License Fee and other dues not otherwise securitized and the PBGs as per the License Agreement, shall be reduced to 20% of the current stipulated requirement.

Further, BGs furnished or required due to any court order, or BGs which are the subject matter of any litigation, will continue such as the BGs for which the DoT has been restrained to encash through a Court order, or BGs related to One Time Spectrum Charges (OTSC) under litigation.

Required amendments for rationalizing the BGs in all the relevant License agreements have been issued on 06.10.2021.

iii. Rationalizing Interest Rate and Penalty

As per the amendment issued on 01.10.2021, any delay in payment of License Fee or any other dues payable under license beyond the stipulated time will attract an interest at a rate which will be 2% above the SBI MCLR existing as on the beginning of the financial year. Interest shall be compounded annually instead of monthly. The clause related to penalty for delayed payments and interest on penalty has been deleted.

2.7.3 SARAS:

i. SARAS: Digitalisation of the largest source of non-tax revenue to Government of India:

SARAS is the new Revenue Management System (RMS) developed by DoT to ease, standardize and automate payment, assessment and reporting of telecom revenue and related ancillary processes. 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.

ii. Key initiatives & Achievements:

- a) SARAS consists of 15 modules catering to different functionalities. These modules are: Setting up Licensee, LF payment and Assessment (LFA), Deduction Claim and Verification (DVR), SUC payment and Assessment (SUC), Bank Guarantee (BG), Court Case, CAF/EMR, Discussion Board, Knowledge Bank, Grievance, User Management, Master Management, Dashboard, MIS, Budget.
- b) SARAS has also been integrated with the following external systems:
 1. Bharatkosh for collection of payments
 2. SMS/Email Gateway for sending out notifications to users
 3. E-sign for signing of documents by TSP users and DoT users
- c) Cloud Infrastructure of SARAS: The SARAS Application has been hosted on a cloud platform. The cloud platform for SARAS comprises of both the Data Centre and a Disaster Recovery Centre.
- d) Training of SARAS for CCA users & Licensees: Physical training sessions of 2 days each were conducted for all the users of CCA/DoT offices across 4 zones in the country. Regular refresher trainings are being conducted through online mode since COVID-19 period. CCA offices are conducting training for their respective decentralized Licensees on regular basis.
- e) Current Usage by Industry:
 1. All Licensees across India are using SARAS for making the License Fee payment since October 2019 onwards for quarterly LF payments in normal course. From Oct 2019 till November 2021, License fee amounting to Rs 52,293 Cr. has been paid by licensees through SARAS.
 2. All Licensees across India have started submission of Quarterly Unaudited/ Audited AGR Statements through SARAS.
 3. Till date, Rs 59,416 Cr. has been paid by licensees through SARAS for License Fee/Spectrum usage charges.
 4. Licensees are submitting the unaudited/audited deduction related claims in SARAS.
 5. Licensees are responding on show cause notices issued by CCA/DoT regarding LF/SUC Assessment, Bank Guarantee and Deduction Claims.
 6. LF Assessment of Licensees: DoT/CCA users have started the License Fee Assessment and issuance of show cause cum demand notice from SARAS.
 7. Deduction Claim Verification: Licensees has started submission of deduction claims documents in SARAS from FY 2020-21 onward. CCA users started verification of deduction claim documents submitted by licensees and issuance of provisional/final DVR.

8. SUC Assessment of Licensees: CCA users have started the SUC Assessment through SARAS.

iii. Current Status of SARAS Utilization

Total Licensees onboarded	1,531
Total Licenses onboarded	3,294
Total number of Demand issued through SARAS	299
Total number of Bank Guarantees	6,710
Value of Bank Guarantees (in Rs. Cr)	66,990
Total BG Released through SARAS	101
Value of Bank Guarantees Released through SARAS (in Rs. Cr)	1,687
Deduction claim submitted by licensees	611
LF collection through SARAS (in Rs. Cr)	52,293
SUC collection through SARAS (in Rs. Cr)	7,123

iv. New initiatives under progress:

- a) Implementation of Telecom Sector reforms with respect to Bank Guarantee Management, Statement of Revenue, and assessment calculations.
- b) Development of 33 new MIS for robust data management
- c) Upgradation of SARAS application for promoting transparency and efficient service delivery
- d) Integration of SARAS with SARAL SANCHAR application of DoT for onboarding of new licensees.

2.7.4 Receipts:

i. Spectrum Usage Charges (SUC) & other receipts for FY 2021 -22 is as under: -

(In Rs. cr.)

Nature of Receipts	April 2022 To Oct. 2022 (Actual revenue for 7 months)	Anticipated receipts Nov. 2022 to March 2023 (expected revenue for 5 months) (FY 2022-23)	Total receipts in the Financial year 2022-23
Spectrum Usage Charges (SUC)- CDMA+GSM+BWA +VSAT	3739.40	2260.60	6000.00

Auction instalments/ pre-payment receipts	9696.00	0	9696.00
Upfront Spectrum Auction payment receipts	8312.00	0.00	8312.00
DDs/e-receipts (NEFT/RTGS)/ Bharatkosh from WPC (Spectrum Charges for captive network etc.)	377.27	222.73	600.00
Receipts from BSNL on account of cost of administratively allotted Spectrum	19808.00	0	19808.00
Grant Total	41932.67	2483.33	44416.00

2.7.5 Foreign Investment Policy and Promotion

- i. Pursuant to the reforms of the telecom sector, the Government of India have allowed 100% FDI under automatic route in Telecom sector subject to Press Note 3(2020) dated 17.04.2020 regarding foreign investments from land bordering countries. In accordance with this decision, DPIIT has issued Press Note No. 4 (2021 Series) dated 06.10.2021 notifying necessary amendments under the FDI Policy and the amendments under FEMA Rules/Regulations in the light of Union Cabinet Reforms have been notified by Department of Economic Affairs on 12.10.2021.

Notwithstanding the provisions of Para 5.2.14 of the FDI Policy, foreign investment in Telecom Services will be subject to the provisions of Para 3.1.1 of the FDI Policy [as amended vide Press Note 3(2020 Series) dated 17.04.2020]. Accordingly, cases requiring prior Government approval under the provisions of Para 3.1.1 of the FDI Policy, will continue to be on the Government route.

- ii. Upon abolition of Foreign Investment Promotion Board (FIPB) in 2017, the process for approving foreign investment is being dealt with by the concerned administrative Ministries/Departments. For the Telecom Sector, the Department of Telecommunications, Ministry of Communications is responsible for processing FDI Cases under the FDI Policy. Suitable systems and mechanisms have been put in place to handle this work and Foreign Investment Policy & Promotion (FIPP) Wing of the Department of Telecommunications deals with the work related to processing of cases. In this regard, it coordinates with the other wings/divisions of the DoT and also other Ministries/Departments of Government of India and Regulatory bodies like SEBI, RBI etc.

- iii. Total FDI inflow into telecommunications sector during April, 2000 to September, 2022 was Rs. 2,32,367/- crore. Telecommunications is the third largest sector in terms of FDI equity inflows after Services sector, Computer software and hardware sector as given in Table below: -

Table: Top Three sectors attracting highest FDI equity inflows

(Amount in US\$ Million)

Rank	Sector	2020-21 (April- March)	2021-22 (April- March)	2022-23 (April- September)	Cumulative inflows (April 2000 to September, 22)	%age to Total Inflows
1	Services Sector*	5,060	7,131	4,162	89,356	16%
2	Computer software and hardware	26,145	14,461	6,282	91,799	15%
3	Telecommunications	392	668	694	39,025	6%

Source: FDI Statistics have been taken from official website of Department for Promotion of Industry and Internal Trade (DPIIT) i.e. dpiit.gov.in

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

- v. FDI is an important component of 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 which grew has also helped the other sectors to grow through diffusion of information and ideas. Since the telecommunication industry is capital intensive and heavily dependent on technology, FDI in telecom holds the promise of accelerating its growth.
- vi. National Single Window System (NSWS) / Investment Clearance Cell (ICC) is the flagship program of DPIIT implemented across Govt. of India and State Govts. to promote ease of doing business and reduce compliance burden on investors. It is a 'One-stop digital platform' which integrates the existing clearances/approvals of the various Ministries/ Departments.

2.7.6 Budget:

- i. 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.

- ii. The Section prepares Budget Brief with regard to examination of the DDG by the Parliamentary Standing Committee on Information Technology. In this connection, replies to List of Points/Supplementary List of Points received from the Lok Sabha Secretariat are collated/prepared by the Section.
- iii. Action Taken Notes (ATNs) on the Recommendations made by the Parliamentary Standing Committee in respect of the DDG are collated by Budget Section.
- iv. Budget at Glance Statements:
 - a) The following table shows the Gross Budget under Revenue and Capital Sections.

Rs. in crore

Section	Actual Expenditure 2021-22	BE 2022-23	Actual Expenditure up to 31.12.2022
Revenue	28470.55	30436.38	31385.40
Capital	3327.83	54150.42	26429.05
Total	31798.38	84586.80	57814.45

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

Rs. in crore

Particulars	Actual Expenditure 2021-22	BE 2022-23	Actual Expenditure up to 31.12.2022
USOF (Bharat Net)	7510.96	0.00	0.00
USOF (Other than Bharat Net)	789.04	2000.00	816.60
C-DOT	400.00	500.00	375.00
Pension	14865.57	19000.00	12857.54
Salaries	482.46	612.90	434.12
Incremental Pension payment to voluntarily retiring employees of BSNL and MTNL	3473.40	3300.00	2670.96
Ex-gratia payment to retiring BSNL and MTNL Employees	0.00	0.00	0.00

Grant in aid to BSNL for payment of GST on 4G Spectrum	0.00	3550.00	0.00
TRAI	92.00	90.00	66.00
Interest on MTNL Bonds	383.57	383.57	347.95
PLI Scheme	0.00	527.68	4.25
VGF to BSNL	0.00	0.00	13489.48
Others	473.55	472.23	323.50
Total (Gross)	28470.55	30436.38	31385.40

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

(Rs. in crore)

Particulars	Actual Expenditure 2021-22	BE 2022-23	Actual Expenditure up to 31.12.2022
OFC Network for Defence Services (NFS)	3069.92	1961.00	1000.00
USOF (Bharat Net)	0.00	7000.00	1285.06
Equity infusion for ITI Revival	71.57	200.00	80.00
Capital infusion in BSNL/MTNL for 4G Spectrum	0.00	44720.00	23873.44
5G Test Bed	10.21	10.00	0.00
Establishment of Satellite Gateway Assistance to BSNL	0.00	0.00	0.00\
TRAI Building	113.00	135.60	135.60
Digital Intelligence Unit (DIU)	0.00	10.00	0.00
Others	63.13	113.82	43.60
Total (Gross)	3327.83	54150.42	26429.05

2.7.7 Disbursement of terminal benefits

- i. Pension: With the promulgation of Rule 37(A) along with Rule 37 of the CCS Pension Rules, the government plays a critical role in the disbursement of pension to officers and officials of DoT and the erstwhile government servants absorbed in BSNL and MTNL. The CsCA Units are responsible for budgeting of pension expenditure,

Sanction, authorization and disbursement of retirement benefits on CDA and IDA scale to over 3 lakh pensioners. The updated figures are as under:

Financial Year	No. of Pensioners (in lakh)	Pensioners Pension Disbursed (Rs.In crore)
2017-18 (as on March 31, 2018)	3.24	10804.89
2018-2019 (as on March 31, 2019)	3.69	11991.15
2019-2020 (as on March31, 2020)	4.39	13138.81
2020-2021 (as on March31, 2021)	4.67	14928.94

ii. SAMPANN (System for Accounting and Management of Pension):

New software for direct disbursement of Pension to BSNL and DoT retirees is developed as SAMPANN-CPMS (comprehensive pension management system). This Comprehensive Pension Management System was inaugurated by Hon'ble Prime Minister on 29th December, 2018 at Varanasi. Thus, SAMPANN integrates the processing, sanctioning, authorization and payment units under a common platform, facilitating direct credit of pension to the accounts of pensioners. Bank data migration to CPMS of old pensioners is under process.

iii. BHAVISHYA Portal:

It is an online Pension Sanction and Tracking System implemented by Department of Pension and Pensioner's Welfare, GOI. More than 90 Ministries are using this portal for its retiring employees. The Pension authorization, payment of gratuity/ commutation of pension in respect of the inter-ministerial staff working in DOT has been shifted to BHAVISHYA Portal w.e.f. 01 September, 2021 and all sanctions / PPO are issued online through PFMS.

iv. Key initiatives & Achievements:

- a) PFMS (Public Financial Management System): Department of Telecom implemented PFMS from 1st January, 2017. The Budgeting, accounting, processing and movement of bills and payment through designated banks have been automated in all the CCA offices.
- b) NTRP (Non-Tax Receipt Portal): The Electronic Receipt (e-receipt) system for accounting of DoT revenue, has been enabled 100 % in DoT HQ. All the CCA offices w.e.f. 1st Induction Note of Department of Telecommunications 17 January, 2017 through NTRP, which is a single window, online payment portal for payment of Revenue of Government of India.

2.8 MONITORING OF INDICES – KEY ACHIEVEMENTS:

2.8.1 Network Readiness Index (NRI) 2022

Network Readiness Index (NRI) 2022 has been released on 15th November, 2022 by M/s Portulans

Institute, based in Washington DC. NRI is one of the leading global indices on the application and impact of Information and Communication Technology (ICT) in economies around the world. In its latest version of 2022, the NRI Report maps the network-based readiness landscape of 131 economies based on their performances in four different pillars: - Technology, People, Governance, and Impact. Each of these pillars is itself comprised of three sub-pillars that have been populated by a total of 58 variables.

India has improved its ranking by 6 positions from 67 in 2021 to 61 in 2022 and also improved in its score from 49.74 in 2021 to 51.19 in 2022. India ranks 61st out of the 131 economies included in the NRI 2022. India's ranking in NRI-2022 is the best as compared to past 10 years. In NRI 2014, India was ranked 83. Its main strength relates to People (Rank:46). India's rank in other pillars are - Technology (Rank:56), Impact (Rank:62) and Governance (Rank:83).

India is ranked 3rd out of 36 in the group of lower-middle-income countries after Ukraine (50) and Indonesia (59). In terms of pillar performance, it has a score higher than the income group average in each of the four pillars. At the sub-pillar level, it has a higher score than the average of lower-middle-income countries in all of them. India is ranked 11th out of 21 within Asia & Pacific region. It has a score above the regional average in one of the four pillars: people.

India secured 1st rank in "AI talent concentration", 2nd rank in "Mobile broadband internet traffic within the country" and "International Internet bandwidth", 3rd rank in "Annual investment in telecommunication services", "Domestic market size", 4th rank in "ICT Services exports", 5th rank in "FTTh/Building Internet subscriptions", "AI scientific publications", 41st rank in "Mobile Tariffs" and 68th rank in "Population covered by at least a 3G coverage".

NRI-2022 report says that India has a greater network readiness than would be expected given its income level.

2.8.2 Monitoring of other Global Indices:

DoT is a Line Department for the following Indices:

- i. Global Innovation Index (GII)
- ii. Global Competitiveness Index (GCI)
- iii. E-Government Development Index (EGDI)
- iv. KOF Globalization Index (KOFGI)
- v. Travel and Tourism Competitiveness Index (TTCI)
- vi. Safe Cities Index (SCI)
- vii. GovTech Maturity Index (GTMI)
- viii. Rule of Law Index (ROLI)
- ix. Corruption Perception Index (CPI)
- x. Worldwide Governance Indicator

2.8.3 Digital Communication Readiness Index (DCRI): DCRI is an Index for ranking States through specific indicators from telecom sector. It intends to stress on States/UTs to lay emphasis on the Communication sector. The DCRI framework, through specific indicators from telecom sectors aims at creating awareness among States / UTs and highlights the role they have to play to facilitate the setting up of Telecom infrastructure.

On 31st October 2022, the DCRI Framework was released to all States / UTs. States / UTs have critical role to play in smooth rollout and functioning of Telecom services. The Framework groups the efforts of the States into two pillars- (i) State led initiatives (ii) Outcomes that measure impact of States initiatives. Under these two pillars, 11 sub pillars have been identified as follows: -Policy for ROW, Policy for Shared Duct Infrastructure, Policy for Building Codes, 5G Rollout, Telecom Skilling, Infrastructure Support to Telecom, Other state policies facilitating telecom sector, Institutional access to broadband, ICT Use, Status of Telecom Indicators in the State, BharatNet. The index has total 73 questions/indicators.

2.8.4 Data Governance Quality Index (DGQI): As per DGQI 2.0 Report released by DMEQ, NITI Aayog in December, 2021 for Q-2 of 2021-22, DoT was ranked 44 out of total 74 Ministries/ Departments. The overall score of DoT improved to 2.61 in DGQI 2.0 as compared with score of 1.14 achieved in the previous version of DGQI (DGQI 1.0- report released in February 2020). In DGQI 2.0 exercise held in April, 2022 for Q4 of 2021-22 and report released in October, 2022, DoT further improved its DGQI score significantly to 3.48 compared with previous round (DGQI 2.0 for Q2 of 2021-22) with its rank moving to 36 among 74 Ministries/Departments.

2.9 PLANNING FOR THE FUTURE

2.9.1 Telecom Bill-New legal framework in Telecom Sector: The existing regulatory framework for the telecommunication sector is based on the Indian Telegraph Act, 1885. The nature of telecommunication, its usage and technologies have undergone a massive change since the era of “telegraph”. We now live in the era of new technologies such as 4G and 5G, Internet of Things, Industry 4.0, M2M Communications, Mobile Edge Computing, etc. These technologies are creating newer opportunities for India’s socio-economic growth. Therefore, India needs a legal framework attuned to the realities of the 21st century. The Ministry of Communications initiated a public consultative process to develop a modern and future-ready legal framework. In July 2022, a Consultation Paper on ‘Need for a new legal framework governing Telecommunication in India’ was published and comments were invited.

Based on the consultations and deliberations, the Ministry of Communications has now prepared a draft Indian Telecommunication Bill, 2022 which has been put in public domain for further consultations. While preparing the draft, relevant legislations in Australia, the European Union, United Kingdom, Singapore, Japan and the United States of America have also been examined in detail. The Bill aims to replace the existing legal framework governing telecommunication in India, comprising of the Indian Telegraph Act, 1885, the Wireless Telegraphy Act, 1933 and the Telegraph Wires (Unlawful Possession) Act, 1950.

2.9.2 Launch of Satellite Broadband Services: In areas where terrestrial connectivity is not available, satellite may be the only backhaul technology available. Satellite backhaul relies on satellite-based bandwidth providers to connect the most remote communities. Depending on the exact type

of technology used, satellite backhaul can be deployed quickly, without the need to build the costly and technically challenging infrastructure required for other backhaul technologies.

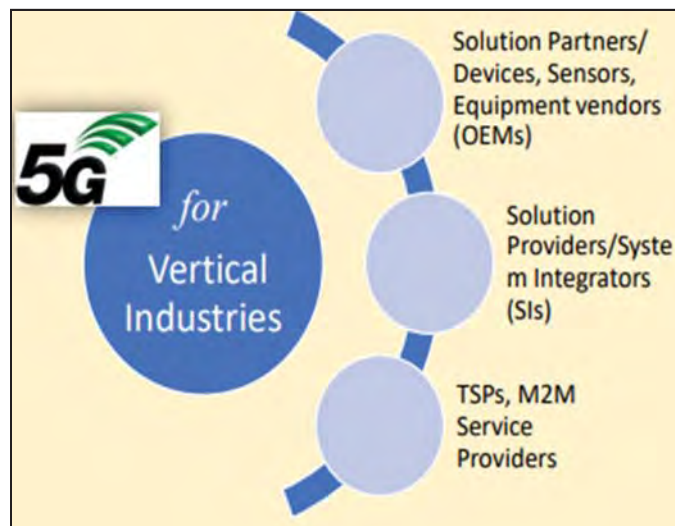
Leading VSAT operator(s) are effectively leveraging the advancements in satellite technology by utilising the indigenous High Throughput Satellites and would be offering services in the North-East, J&K and other areas. BBNL and BSNL are also using ISRO's HTS satellites GSAT-11 and GSAT-19 under BharatNet project to provide connectivity to about 6700 GPs/areas which were not accessible through other mediums. Broadband services from LEO/MEO satellites is expected to be rolled out in near future raising the quality of broadband services in remote and mountainous regions.

2.9.3 Cyber Security through Telecom Security Operation Centre (TSOC): Department of Telecommunications has approved a scheme for the installation of Telecom Security Operation Centre (TSOC) with objective to predict and identify attacks on national telecommunications infrastructure. TSOC is used for identifying the cyber-attacks on telecommunications network and the machines which are initiating such attacks or under attack. TSOC is also used for identifying the presence of blocked application, malicious communications provided by some applications, etc. It is also the main source for providing inputs to Telecom Computer Security Incident Response Team (Telecom-CSIRT), a framework established by the Department of Telecommunications to protect the national telecom infrastructure.

2.9.4 Consumer Protection through the Telecom Analytics for Fraud management and Consumer Protection (TAF-COP) portal: Department of Telecommunications (DoT) has taken several measures to ensure proper allocation of telecom resources by Telecom Service Providers (TSPs) to subscribers and protect their interests in ensuring reduction of frauds. As per existing guidelines, individual mobile subscribers can register up to nine mobile connections in their name. TAF-COP has been developed to help subscribers, check the number of mobile connections working in their name, and take necessary action for regularizing their additional mobile connections if any. However, the primary responsibility of handling the Customer Acquisition Form (CAF) lies with the service providers.

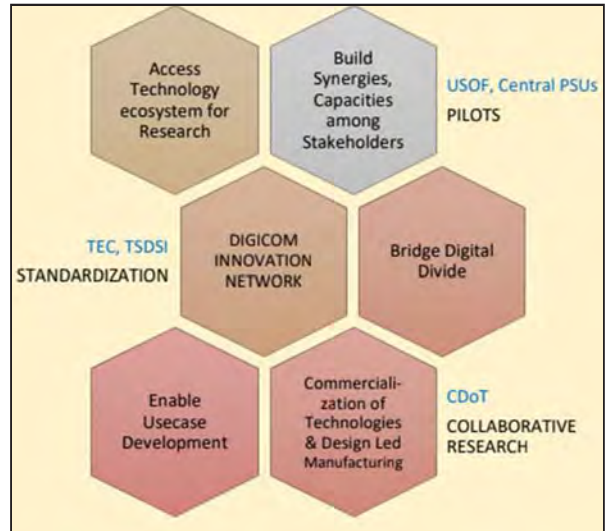
2.9.5 Launch of 5G Vertical Engagement and Partnership Program (VEPP):

DoT has invited Expression of Interest for 5G VEPP to build strong collaboration partnerships across 5G Use-case ecosystem stakeholders. Under this initiative, the division will facilitate necessary approvals, regulatory clearances to enable use case prototyping, pilots, demos, trials at the user or vertical industry premises. Till now, around 40 entities have expressed their interest to be part of it. This initiative will help the vertical ministries to find all the sector-specific solution providers' information at the one place.



2.9.6 Telecom Startups-MSMEs Mission (TSuM):

Startups and MSMEs are envisioned as the backbone for technology development in realizing indigenous telecommunication technologies in line with Hon'ble PM's Vision of Atmanirbhar Bharat. To promote 'Ease of Doing Business and R&D' for Startups & MSMEs, TSuM, an institutional mechanism, has been constituted. Establishment of "Facilitation Cell" under this mission, will ensure continuous engagement and necessary handholding/support to Startups and MSMEs. This facilitation includes R&D Funding, Trials/PoC opportunities, Spectrum requirement, Standardization and other handholding as may be necessary.



2.9.7 5G Use Case Lab Engagements:

Acknowledging the importance of 5G for India, the 5G HLF (High Level Forum) driven by Secretary (Telecom), Secretary (MeitY), and Secretary (DST) made recommendations on several fronts to exploit the opportunity. The Taskforce on applications and use case labs has recommended that use case labs should be set up in each economic vertical with the support of the corresponding ministry and public or private sector industries in a phased manner. To take forward the above recommendations, an Inter-Ministerial Committee has been formed with participation from 21 potential Ministries/departments for implementation of 5G Use cases. Till now, around 20 focused meetings have been organized with respective ministries.

2.9.8 Roadmap for Quantum Communication:

In order to build synergies in quantum communication and related applications, an inter-ministerial committee (IMC) on Quantum Communications under Chairmanship of Member(T), Digital Communication Commission has been constituted with participation from Academia, Industry members, government organization. Based on the several interactions and recommendations of the various task forces of IMC, a comprehensive draft report has been prepared, covering recommendations as well as directory of current ongoing activities in the country. This draft report will serve as a roadmap of quantum communication in the country.

2.9.9 6G Technology Innovation Group (TIG): A 6G Technology Innovation Group (TIG) is constituted by DoT with the objective to co-create and participate in the development of 6G technology ecosystem through increased participation in capability description, standards development at international standard setting bodies. This is necessary to prepare India's manufacturing and services ecosystem to capitalise on 6G opportunity. 6G TIG, comprises members from Government, Academia, Industry Associations and TSDSI (Telecom Standards Development Society of India). The Taskforce have given their reports and based on their inputs, 6G Vision document has been prepared which will pave the way for 6G Mission of India.

Chapter 3
International Relations and Cooperation

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International Relations and Cooperation

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), and International Telecommunications Satellite Organization (ITSO) etc. Bilateral relations and technological cooperation were strengthened. The activities on International Relations front are summarized as below.

3.1.1 Bilateral Cooperation:

- (i) Workshop on Vehicle to Everything (V2X): DoT officers participated in workshop on V2X (Vehicle to Everything) technology held by Ministry of Internal Affairs and Communications (MIC), Japan on 09.03.22 under the framework of Memorandum of Cooperation signed between India and Japan in January 2021. The workshop deliberated on learning from survey research deployment and its effectiveness in creating safer roads and driving conditions through the installation of V2X based priority devices on public transportation systems.
- (ii) Bilateral meeting with Finland: A bilateral meeting between DoT and Finland delegation was held on 19.04.2022 in Sanchar Bhawan to discuss the cooperation in Telecom/ICTs. DoT delegation was led by Additional Secretary (T), DoT and Finland delegation led by Mr. Petri Peltonen, Under Secretary of State, Ministry of Economic Affairs and Employment of Finland.
- (iii) Bilateral meeting with France: A bilateral meeting between Secretary, DoT and Mr. Henri VERDIER, Ambassador for Digital Affairs of France was held on 25th April, 2022 in Sanchar Bhawan. Discussions were held on cooperation in various fields of communications such as 5G and Network Security.
- (iv) Bilateral meeting with German Delegation: A bilateral meeting was held between DoT officials and members of visiting German delegation on 11 May, 2022 to discuss the cooperation in Telecom/ICTs. The Indian side was led by Member (Technology). From German Side, Skyfive presented on the technological demonstration of their In Flight and Maritime Connectivity (IFMC) devices.
- (v) 7th Japan-India ICT Joint Working Group Meeting: The 7th Japan-India ICT Joint Working Group meeting was held on 13th May-2022 on a virtual platform. Additional

Secretary, Department of Telecommunications and H.E. Mr. Sasaki YUJI, Vice Minister for Policy Coordination (International Affairs), Japan co-chaired the meeting. Senior representatives from both governments and other non-governmental stakeholders from Industry, R&D and Academia attended the meeting.

- (vi) Visit of Tanzania Communication Regulatory Authority (TCRA) Officers in DoT for Study Tour: A delegation of the Tanzania Communication Regulatory Authority (TCRA), visited DoT India for study tour from 23-05-2022 to 27-05-22. Study tour involved interaction with DoT, TRAI, Ministry of Information Broadcasting on various topics like licencing frame work for the access service, Data services, Submarine cable services, satellite services, spectrum management and enforcement and compliance of license among others.
- (vii) Bilateral meeting with President BSI Germany: Meeting between Secretary (T) and Mr. Arne Schönbohm, President, BSI, Germany was held on 17th August, 2022. During the meeting discussions were held regarding cooperation on 5G technology, cyber security, Open RAN 5G, etc.
- (viii) Visit of Communication Authority of Kenya (CA) Officers in DoT for Study Tour: Delegation of the Communication Authority of Kenya (CA) visited DoT India for study tour from 07.11.2022 to 11.11.2022. The study tour involved information and knowledge sharing on competitive approaches to spectrum assignment.
- (ix) Meeting between India and Sweden: A meeting between Indian Delegation led by Sh. Ashwini Vaishnaw, Hon'ble MOC, India and Swedish delegation led by Mr. Johan Forsseell, Minister for International Development cooperation and Foreign Trade, Sweden was held in New Delhi on 08.12.2022. During the meeting discussions were held regarding digital public infrastructure, tech-enabled development in multiple areas., Start-up ecosystem, etc.
- (x) India- South Korea Joint Working Group Meeting: The first meeting of Joint Working Group (JWG) between India and South Korea on Cooperation in the field of Telecommunications / ICTs was held in virtual mode on 15th December, 2022. Mr. Premjit Lal, DDG (IR), DoT from Indian side and Mr. Kim SeongGyu, Director General of International Cooperation Bureau, Ministry of Science and ICT from the South Korean side co-chaired the JWG meeting. During the meeting, discussions were held on cooperation in following areas 5G, digital transformation, AI, Nurturing Human Resources in ICT field, Digital Technology to Respond to Climate Change and EMF Norms, etc.

3.1.2 Activities on Multilateral Cooperation and Conferences of Intergovernmental and International Organizations

- (i) 2nd ASEAN Digital Senior Officials Meeting with India (2nd ADGSOM + India) and 2nd ASEAN Digital Ministers' Meeting with India (2nd ADGMIN + India): The 2nd ADGSOM + India meeting was held in virtual mode on 25th January, 2022. India presented India-ASEAN Digital work plan 2022 in the meeting. Subsequently, the 2nd ADGMIN

+ India meeting was held in virtual mode on 28th January, 2022. The meeting was Chaired by Admiral Tin Aung San, Hon'ble Minister of Transport and Communications, Myanmar and Co-chaired by Shri Devusinh Chauhan, Minister of State for Communications, India. The representatives from all ASEAN Member Countries and ASEAN Secretariat participated in the meeting. ADGMIN + India meeting considered and approved the India-ASEAN Digital work plan 2022.

- (ii) World Telecommunication Standardization Assembly (WTSA)-20: A DoT delegation led by Additional Secretary participated in Global Standards Symposium (GSS) held on 28 February 2022 and WTSA-20 held during 1-9 March 2022 in Geneva, Switzerland. WTSA is held every four years and defines the next period of study for ITU-T (International Telecommunication Union-Standardization sector). During the event, Chairs and Vice-Chairs of Study Groups of ITU-T were selected. Out of eleven Study Groups, India secured positions in eight Study Groups.
- (iii) Signing of Host Country Agreement (HCA) for establishment of ITU Area Office and Innovation Centre in New Delhi: The HCA for the establishment of an Area Office & Innovation Centre of ITU in New Delhi was signed by Shri Ashwini Vaishnaw, Union Minister of Communications and Mr Houlin Zhao, Secretary General of International Telecommunication Union (ITU) on 3rd March 2022 in a virtual ceremony. The Host Country Agreement provides the legal and financial framework for establishment and operations of the Area Office.



HCA for the establishment of an Area Office & Innovation Centre of ITU in New Delhi, Hon'ble Minister of Communications, Shri Ashwini Vaishnaw and Secretary, Department of Telecommunications, Shri K Rajaraman during the event.

- (iv) ITU Council Session 2022: A DoT delegation participated in the 2022 Session of ITU Council at ITU Headquarters, Geneva, Switzerland during 21-31 March 2022. During the meeting India has secured a vice-chairperson position in Council Standing Committee on Administration and Management of International Telecommunication Union (ITU). Deliberations and discussions were held during the council meeting and Indian delegation defended their contributions.
- (v) Meeting with OECD: Secretary, DoT had a meeting with OECD delegation comprising of Mr. Andress Schaal (OECD Global Relations Director and OECD Sherpa Global Relations Secretariat) and Ms. Nejla Saula (Head of Unit Sherpa office and Global Governance Unit) on 26th April, 2022 to discuss areas of mutual interest in the field of communications.
- (vi) Intersputnik Meeting: The 50th Joint Session of the Board and the 24th Session of the Operations Committee meetings were held on 26th & 27th April, 2022. Officers of DoT participated in the meetings.
- (vii) Commonwealth ITU Group Meeting: Commonwealth ITU Group Virtual Meeting was held virtually on 23 May 2022. The meeting provided an opportunity for Commonwealth colleagues to meet each other before World Telecommunication Development Conference, to present their candidacies for the upcoming elections at Plenipotentiary conference of ITU and discussed areas of commonality in our priorities for the upcoming conferences.
- (viii) 1st Meeting of BRICS Joint Working Group on ICT Cooperation: The first Meeting of BRICS Joint Working Group on ICT Cooperation was held from 25-27 May, 2022 to discuss the documents and draft declarations for the upcoming 8th BRICS Communications Ministers Meeting on 6th July, 2022.
- (ix) World Summit on the Information Society (WSIS) Forum 2022: Indian delegation led by Shri Devusinh Chauhan, Hon'ble Minister of State of Communications participated in WSIS Forum meeting held in Geneva, Switzerland during 31st May - 3 June 2022. Hon'ble Minister of State of Communications delivered policy statement on the theme of "Bridging Digital Divides" in the High-Level Interactive Policy Session and attended the Ministerial Roundtable on 1st June 2022.
- (x) World Telecommunication Development Conference 2021 (WTDC-21): Indian delegation led by JS(T) participated in WTDC-21 held in Kigali, Rwanda, from 6th to 16th June 2022. The delegation defended the Indian contributions in various resolutions and secured position of Vice-chair in Study Group 1 of ITU-D. During the event, Parter2connect pledge and policy statement were delivered virtually by Secretary, DoT.

- (xi) BRICS Institute of Future Networks (BIFN) council Meeting and BRICS Working Group meeting on ICT Cooperation: BIFN council meeting was held on 22.06.2022 and 2nd Meeting of BRICS Working Group on ICT Cooperation was held on 24, 25 & 30 June, 2022. The Indian delegation was led by DDG (IR), DoT in both the meetings. Discussions were held to finalize the Work Plan of BRICS Institute of Future Networks, Work Plan for Digital BRICS Task Force and Declaration of 8th BRICS Communication Ministers Meeting to be adopted in the BRICS Communication Ministers Meeting to be held in July 2022.
- (xii) ITSO AP-40 Meeting (Assembly of Parties-40) Meeting: International Telecommunication Satellite Organization AP-40 Meeting (Assembly of Parties-40) Meeting was held from 28-30 June, 2022 to discuss the various issues of ITSO, DDG (Satellite) attended the meeting from India through virtual format.
- (xiii) 8th Meeting of BRICS Communications Ministers: The 8th Meeting of BRICS Communications Ministers was held in virtual mode on 06.07.2022 under the presidency of China. Hon'ble Minister of Railways, Communications, Electronics and Information Technology Shri. Ashwini Vaishnaw, participated in the meeting and highlighted achievements of India in the field of ICT. He also underlined the reforms undertaken by Government in Telecom sector. The Ministers decided to work in the field of ICTs in areas identified at the 14th BRICS Summit held on 23-24 June 2022. All Ministers appreciated the work-plans finalized for BRICS Institute for Future Networks (BIFN), Digital BRICS Task Force (DBTF) and hoped that these mechanisms will help in deepening Innovative cooperation among BRICS countries. The Ministers also adopted a Declaration of the 8th BRICS Communications Meeting. All Ministers appreciated India's offer for platforms for Digital Public Goods like Aadhar, CoWin, UPI and Diksha and decided to further collaborate in this area.
- (xiv) ADGSOM-ATRC JWG Meeting with India: ASEAN Digital Senior Officials' Meeting (ADGSOM) and ASEAN Telecom Regulators Council (ATRC) Joint Working Group (JWG). (ADGSOM-ATRC JWG) Meeting with India was held on 26th July 2022 in virtual mode. The representatives from IR Wing DoT, Indian Mission to ASEAN, all ASEAN Member States and ASEAN Secretariat participated in the meeting. During the meeting, India presented the progress of India- ASEAN Digital workplan 2022 and the activities proposed under India- ASEAN Digital workplan 2023.
- (xv) ITU Study Group 3 Regional Asia Oceania meeting: DoT India hosted ITU Study Group 3 Regional Asia Oceania meeting from 8 -12 August 2022 in New Delhi, India. On the side-lines an exhibition demonstrating indigenous 4G and 5G technologies along with other new and emerging technologies was also organized.



Hon'ble Minister of State for Communications Shri Devusinh Chauhan in ITU Study Group 3 Regional Asia Oceania meeting

- (xvi) Online workshop on 'Fostering Broadband Access and Connectivity': A 2-day online workshop on 'Fostering Broadband Access and Connectivity' was organized by TRAI during 30 – 31 August 2022 under India-ASEAN Digital Workplan 2022. Participants from Regulators/Ministry of ASEAN Member States and TRAI & DoT participated in the event.
- (xvii) Elections at ITU Plenipotentiary Conference 2022 (PP-22)-Indian delegation led by Shri Devusinh Chauhan, Hon'ble Minister of State for Communications participated in ITU PP- 2022 held in Bucharest, Romania from 24 Sept-14 Oct 2022. Hon'ble Minister of States of Communications delivered a high level policy statement on theme "Connect and Unite" on 27th September 2022 during the event. During the first week of the ITU PP-22 conference, the Hon'ble Minister of State of Communications held bilateral meetings with United States, Cuba, Russia, Egypt, Saudi Arabia, Tunisia, etc.

Elections were held for ITU Council and various posts of ITU during International Telecommunications Union (ITU) Plenipotentiary Conference 2022 (PP-22) in Romania during 26 Sept-14 October 2022. India got re-elected as a Member of the ITU Council for the period of 2023-2026. Also, Ms. M. Revathi, a DoT officer, got elected for the position of ITU-RRB Member for this period.

- (xviii) Signing of agreement with United Nations (UN) on Way finding Application: Agreement between the Government of India and the United Nations on A Way Finding Application to be used in the Palais des Nations Compound was signed on 19th October 2022. The project of development of 'Way Finding Application' has been conceptualized as donation from the Government of India to UN. The project consists of development deployment and maintenance of a software-based 'Way Finding Application' to

facilitate navigation in the Palais des Nations premises of UN Office in Geneva (UNOG). The application will enable users to find their way from point to point within the 21 floors spread across five buildings of UNOG.

3.2 INTERNATIONAL COOPERATION

The International Cooperation Division of the DoT deals with activities of prime importance relating to WTO negotiations, bilateral and multilateral trade agreements relating to telecommunications, coordination with Telecom Equipment and Services Export Promotion Council (TEPC); Telecommunications Standards Development Society of India (TSDSI), administration of Telecom Centres of Excellence (TCOE India), hosting of Exhibitions/Conferences and seminars relating to telecom etc.

3.2.1 India Mobile Congress 2022

India Mobile Congress (IMC) 2022, the leading digital event in India and Asia organized by the Department of Telecommunications (DoT) along with Cellular Operators Association of India (COAI), was held from 1st to 4th October 2022 at New Delhi. Recognizing the immense benefits of digital technology advancement, the 6th edition of IMC-2022 with the theme of 'New Digital Universe' had the objective of promoting India as a communication leader globally.

Inaugurated by Hon'ble Prime Minister, Shri Narendra Modi on 1st October 2022 at New Delhi, IMC 2022 brought together stakeholders across the ICT industry to debate, discuss, disseminate and demonstrate the endless potential of 5G. Aligned with Hon'ble Prime Minister's vision of ensuring that benefits of digital technology to the remotest corner of India as envisioned in Antyodaya. The event focused on ideating how to democratize 5G in India across sectors like healthcare, education, agriculture, animal husbandry, industrial manufacturing, environment and worker safety apart from promoting Atmanirbharta in communication sector.

The event also showcased how India is championing technology, fostering international and regional cooperation, inspiring inclusive & sustainable development, promoting entrepreneurship and innovation through startups, driving foreign and local investments amongst others. IMC 2022 brought together leading thinkers, entrepreneurs, innovators and government officials to discuss and showcase unique opportunities emerging from the rapid adoption and spread of digital technology.

The inauguration session was also graced by Shri Ashwini Vaishnaw, Hon'ble Minister for Communications, Electronics & Information Technology and Railways, Shri Devusinh Chauhan Hon'ble Minister of State for Communications, Shri K Rajaraman, Secretary Department of Telecommunications along with other government officials. Mr. Mukesh Ambani Chairman of Reliance Industries, Mr. Sunil Bharti Mittal Chairman of Bharti enterprises, Mr. Kumar Mangalam Birla Chairman of Aditya Birla Group also participated in the inaugural session along with other industry stakeholders.

The inauguration session had participation of Shri Bhupendra Rajnikant Patel, Hon'ble Chief Minister of Gujarat from Ahmedabad, Shri Eknath Sambhajji Shinde, Hon'ble Chief Minister of Maharashtra from Mumbai, Shri Naveen Patnaik, Hon'ble Chief Minister of Odisha from Bhubaneswar, Shri Yogi Adityanath, Hon'ble Chief Minister of Uttar Pradesh and Shri Vinai Kumar Saxena, Lieutenant Governor of Delhi connected virtually.

During the course of the four days the event was also graced by Shri Piyush Vedprakash Goyal Hon'ble Union Minister of Commerce and Industry, Shri Mansukh Laxmanbhai Mandaviya Hon'ble Union Minister of Health and Family Welfare, Shri Pralhad Venkatesh Joshi Hon'ble Union Minister of Parliamentary Affairs Coal and Mines, Shri Rajeev Chandrasekhar Hon'ble Minister of State for Electronics & Information Technology and Skill Development & Entrepreneurship, Shri Bhanu Pratap Singh Verma, Hon'ble Minister of State for Micro, Small & Medium Enterprises and Secretaries as well as senior officials from various ministries and public departments of Government of India.

IMC 2022 was one of its kind technology events held in person after two years which attracted over one lakh attendees including students, more than 1,300 CXQ's, over 6,900 government delegates, over 1,900 representatives from start-ups and MSMEs, more than 350 speakers and 239 exhibitors.

3.2.2 Telecom Centre of Excellence (TCOE) India

TCOE India has been created as a Public Private Partnership (PPP) initiative by the DoT in the year 2007. The important activities of TCOE India during the year 2022 are to strengthen the R&D & Innovation ecosystem in ICT domain where Government works as a facilitator, Industry as the ultimate user and Academia as the research unit to encourage & support innovations by Start-ups/ MSME's. The brief of work done is as under.

- i. TCOE India as Implementing Agency(IA) for DCIS Scheme of DoT: DoT has launched Digital Communication Innovation Square (DCIS) to promote the ecosystem for research, design, development, proof of concept testing, IPR creation, pilot project and manufacturing i.e., complete value chain to make India a global hub for production of telecommunication equipment and a center for digital communication services. DoT has selected TCOE India as Implementing agency for this Scheme. Total 17 Start-ups/ MSMEs completed their products/solutions funded in 2021 & 43 start-ups were selected under the DCIS 2022-23 for support under the scheme and first instalment has been released in September 2022.
- ii. 5G Hackathon: TCOE India is also involved in the 5G Hackathon as an Execution Partner of DoT to identify the best India specific use cases in 5G domain.
- iii. Bharat Digicom Innovation Network-Bharat Digicom portal (one stop Digital collaboration platform for Tech Stakeholders): TCOE India is the Implementing Agency for the portal and will provide the necessary support to the ecosystem.
- iv. Telecom Technology Development Fund (TTDF): DoT has launched Telecom Technology Development Fund (TTDF) Scheme which aims to encourage & support domestic companies and institutions involved in technology design, development, commercialization, trials & use cases of telecommunication products and solutions, to enable affordable broadband and mobile services in rural and remote areas. TCOE India is one of the Implementing Agency in TTDF.

3.2.3 Telecom Equipment and Services Export Promotion Council (TEPC)

Telecom Equipment and Services Export Promotion Council (TEPC) has been set up by the Government of India to promote and develop exports of telecom equipment and services from India.

i. TEPC Participation in events during 2022

TEPC organized various structured promotional events so as to create awareness about the capability of Indian telecom products and services. There is not only a need to sustain the existing markets but also offer Indian products and services as a potential alternative to the world market. Indian telecom stakeholders have explored the telecom markets in different countries virtually during the year 2022 as under.

a) ConnecTech Asia 2022, June 1-3, 2022, Singapore

TEPC participated in ConnectechAsia Singapore with 15 companies held on June 1-3, 2022. CommunicAsia brings together Informa's 5G Asia, Broadband Asia, Telco AI Asia and Edge Asia shows creating a networking and insights power-event catering for the region's telecoms ecosystem. Featuring 130+ legendary speakers from across the region who shared insights, experiences and vision for new service offerings, monetisation opportunities and technology evolution, as well as an interactive exhibition allowing to experience the technology and F2F time with buyers and innovative partners.

b) Telecom Investor Round Table, July 30, 2022, Mumbai

A Telecom Investor Round table focusing on Investment opportunity and Telecom reforms was organised in Mumbai on July 30, 2022. This event was attended by industrialists, investors, bankers, venture capitalists and senior Government officials among others. Fifteen companies showcased their products and more than one hundred companies participated in the event.



c) India Africa ICT Expo & Conference, September 14-15, 2022, Accra, Ghana

To reiterate the relationship and commitment between India, Ghana and other African countries, Telecom Equipment and Services Export Promotion Council (TEPC) with support of Ministry of Communications, Government of India organised the 'India Africa ICT Expo' on September 14-15, 2022 at Accra, Ghana. The event brought together over forty-five ICT companies from India and Ghana. The expo attracted over 500+ business visitors.

d) India Mobile Congress, October 1-4, 2022, New Delhi, India

TEPC organised Aatma Nirbhar Bharat Pavilion in India Mobile Congress held on October 1-4, 2022 at Pragati Maidan, New Delhi under Champion Sector Scheme of Department of Telecommunications, Government of India. Around 30 foreign delegates attended the event from more than 12 countries like Cambodia, Laos, Bhutan, Nigeria, Russia etc.

TEPC created the platform to bring potential buyers from across the globe to interact and finalise business deals after B2B meetings with quality telecom equipment manufacturers and ICT services solution providers from India. TEPC invited foreign delegates from different countries for B2B meetings with the Indian companies.

e) GITEX, October 10-14, 2022, at Dubai, UAE

TEPC organised TEPC- India Pavilion in GITEX Technology Week 2022 which was scheduled on October 10-14, 2022 at Dubai. The event was organised under the Champion Sector Scheme of the Department of Telecommunications. Twenty-three Indian companies participated in the exhibition and showcased their products and services.

GITEX is one of the biggest ICT events featuring more than 6,000 companies and over 1,75,000 industry visitors. GITEX offers a week packed with business networking, product showcasing and brand launch platforms for regional and international decision makers. This is a good opportunity for TEPC members to showcase their products and technology solutions in the exhibitions and an excellent opportunity for interaction with foreign buyers.

f) AFRICACOM 2022, November 8-10, 2022, Cape Town, South Africa

Telecom Equipment & Services Export Promotion Council (TEPC) organised 'India Pavilion' in AfricaCom 2022, held on November 8-10, 2022 at Cape Town, South Africa under Champion Sector Scheme of Department of Telecommunications.



3.2.4 Telecommunications Standards Development Society India (TSDSI)

TSDSI (<https://tsdsi.in/>) was established as an autonomous body by Indian industry, Academia, Research entities recognised by the Government of India to drive Telecom Standardization activities in India and project Indian interests in global forums.

TSDSI is a member of Global Standards Collaboration (GSC), a body comprising all global telecom standards development organizations (SDOs), an Organizational partner of third Generation Partnership Project (3GPP), which is driving next generation wireless standards (eg.5G), Partner Type 1 of oneM2M, an international partnership project working on creation of a standard M2M service layer framework and Members of ITU-R SG5 (Terrestrial Services) and ITU-T SG15 (Transport, Access and Home).

i. Key Highlights of 2022-2023

Global Impact:

- a) TSDSI's 5Gi standard has been formally merged with the 3GPP 5GStandard and implemented into the 3GPP Rel-17 NR specifications in the March RAN#95-e Meeting. 3GPP RAN approved two Rel-17 ChangeRequests (CRs) that enables Pi/2-BPSK waveform with filtering to be implemented in the 5G Networks. This indigenously developed technology enables the deployment of 5G cell sites with long range – an important requirement for improving cellular and IoT connectivity in rural India.

Standardization Activities:

- b) Transposition of 3GPP Release 17 Specifications as TSDSI standards: TSDSI Study Group – Networks transposed approximately 1,227 Nos. 3GPP Release 17 Specifications.
- c) Transposition of 3GPP "Series 33" Release 15 and 16 Documents: TSDSI transposed 126 Standards and Technical Reports of 3GPP "Series 33" Release 15 and 16. These standards will be used/referred in Indian Telecom Security Requirements (ITSARs) that are being developed at NCCS.

Total standards published by TSDSI now stands at 6,661.

Pre-Standardization activities:

- d) Roadmap Workshop: An online workshop was held on 10 March 2022 to identify additional subtopics under the 9 clusters of Roadmap 2.0 for further technical studies and standardization. 14 proposals were presented in the workshop which was attended by 117 participants.
- e) DoT-TEC-TSDSI Joint workshop on “5G Advanced and Beyond (6G) Including for IMT for 2030: A joint workshop was organized by DoT, TEC and TSDSI on “5G Advanced and Beyond (6G) Including for IMT for 2030” on 25 April 2022. Nine (9) contributions were received from TSDSI- 3GPP IMs.
- f) Following new Technical Reports have been published:
 1. Service Delivery using 5G Broadcast for TV, Radio, IPTV and File-casting (TSDSI TR 6015 V1.0.0)
 2. Visible Light Communication/Li-Fi (TSDSI TR 6016 V1.0.0)
 3. 6G: Use cases, Requirements and Enabling Technologies (TSDSI TR 6017 V1.0.0)
 4. Minimum Technical Requirements for PPDR system deployment in India (TSDSI TR 6019 V1.0.0)
 5. Study of 6 GHz spectrum for IMT services in India (TSDSI TR 6020 V1.0.0)
 6. Study on Edge Intelligence standards for haptics related IIoT use cases (TSDSI TR 6018 V1.0.0)
- g) TSDSI released a White Paper on 6G
- h) The India EU Partnership Project on ICT Related Standardisation, Policy & Legislation, in which TSDSI is the India Anchor, has been supporting various capacity building activities for M2M/IoT (IoT/M2M Capacity Building workshop by IIIT Hyderabad CoE on oneM2M, webinars on oneM2M and a “Build-a-thon: AI/ML driven Low Latency Closed Loop Control” by IIT Delhi). The project approved 6 activity proposals from TSDSI Members (IIIT Delhi, UIET Punjab, IIT Bhilai, IIT Delhi and IISc Bangalore).
- ii. Contributions and Engagement in Indian & Global Ecosystem
At ITU
 - a) Inputs on TSDSI activities as included in Region 3 activity report compiled by ARIB [5D/1057]
 - b) Contribution for working document towards preliminary draft new Recommendation ITU-R M.[IMT.VISION 2030 AND BEYOND] (June 2022)

- c) Contribution towards the update of ITU-T IMT-2020 Roadmap to the Joint Coordination Activity (JCA-IMT2020) of ITU-T (June 2022)
- d) Contribution on update to the draft working document towards a preliminary draft new report ITU-R M.[IMT.Above 100 Ghz]. (Oct 2022)
- e) ITU-T SG-13 in its meeting held in Geneva from 4-15 July 2022 approved the contribution from IDRBT, Member TSDSI, as part of ITU-T Supplement 71 to ITU-T Y.3000 series, the same has now been pre-published: Following the discussion of TSDSI-SGSS-NIP267 in TSDSI, IDRBT had presented the contribution (ITU-T FGAN-I-060-R1) based on it, to ITU-T in June 2021. This contribution was finally approved by ITU-T SG13 closing plenary on 15 July 2022. This adds pioneering use cases based on NIP 267, enabling microfi-nance and rural fi-nancial inclusion via Autonomous Networks and the corresponding requirements, to ITU-T Supplement 71 to ITU-T Y.3000 series. The document is available at <https://www.itu.int/rec/T-REC-Y.Sup71-202207-P/en>
- f) Three contributions from IIT Delhi, IIT Bhilai, JKSBOTE (Jammu and Kashmir Board of Technical Education), University of Kashmir and TCS were submitted to ITU-T Focus Group on Autonomous Networks. These are based on SI 90 (Creation of Edge Intelligence standards for latency and privacy management) and WI1-NIP 282 (Enhancement of application enablement architecture EDGEAPP (3GPP SA6 WG) with the support of 5GS (5G System) to enable tactile applications with edge intelligence in an Indian deployment scenario). These three contributions were developed under the Build-a-thon India round, hosted by IIT Delhi and supported by TSDSI, Indo-EU Partnership Project and ITU.
- g) A contribution titled “Internet of Things (IoT) and deep learning based multi-model system for detection and management of Active Fire Locations (AFL) in Agricultural activities” was presented by UIET Chandigarh during the 17-19 October meeting of ITU Focus Group on AI and IoT for Digital Agriculture. This contribution was developed under the Indo-EU Partnership Project, hosted by UIET and supported by TSDSI.
- h) *oneM2M Tech Talk*: TSDSI and Malaysian Technical Standards Forum Bhd (MTSFB) partnered to conduct an awareness session on oneM2M “oneM2M Tech Talk” to celebrate the World Standards Day on 14 October 2022.

Ecosystem

- i) TSDSI organized the 5th Edition of its Annual Tech Deep Dive (TTDD) Conference 2022 from 7-10 November 2022. The theme of the conference was “Standards for Sustainable Development”.

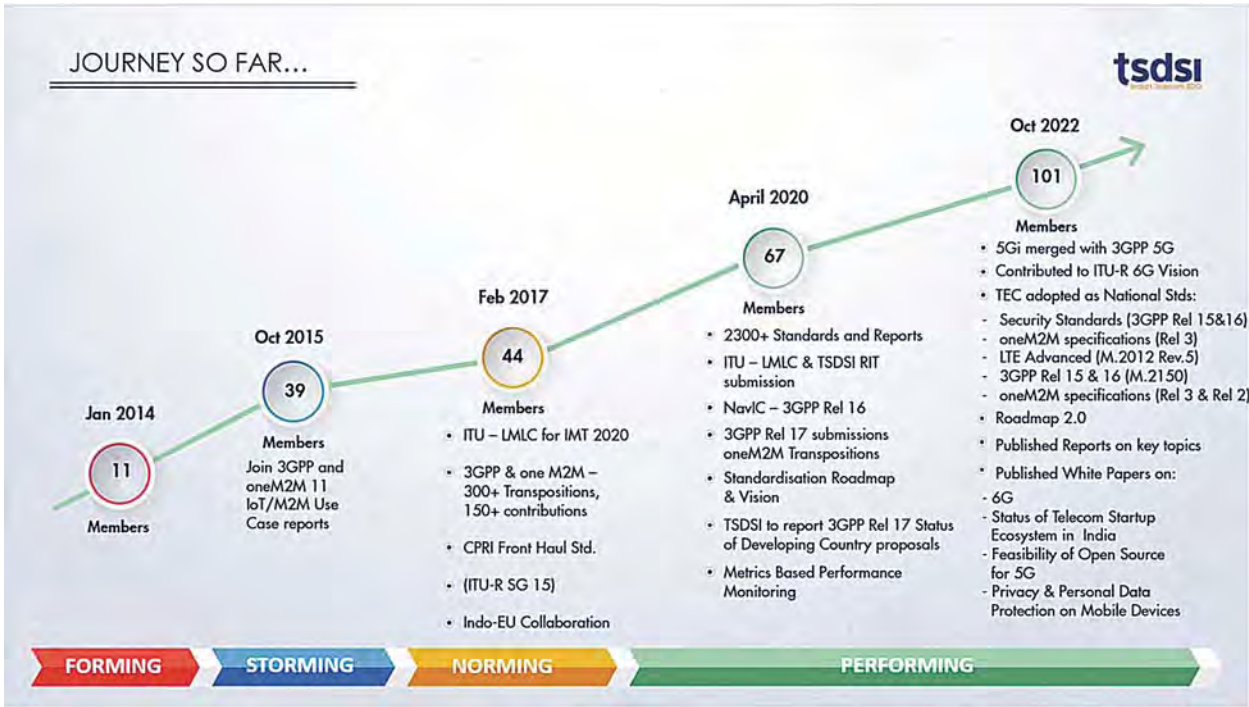


Shri K Rajaraman, Secretary Department of Telecommunications in TSDSI Tech Deep Dive Conference.

In his Inaugural Speech at the conference, Shri K Rajaraman Chairman DCC and Secretary (Telecom), Ministry of Communications encouraged TSDSI to work with Policy makers to make changes in policies or introduce new ones that will enable wider participation in Standards.

- j) *Towards 5G Advanced and 6G – An International Conference @IMC 2022*: TSDSI in partnership with DoT organized an International Conference on “Towards 5G Advanced and 6G” as part of India Mobile Congress IMC 2022 from 1-4 October 2022.
- k) *TSDSI-ITU Webinar Series on “Digital Technology Innovations – Case Studies from India and the Asia-Pacific Region”*: TSDSI in collaboration with ITU has launched a joint webinar series on “Digital Technology Innovations – Case Studies from India and the Asia-Pacific Region”, with support from the Department of Telecommunications, select Ministries of Govt of India and other partners from the Asia-Pacific region.
- l) *DoT-TSDSI Webinar Series on IoT/M2M Applications for Verticals*: A webinar series on “IoT/M2M applications for Verticals” is being jointly organized by DoT & TSDSI in order to strengthen the M2M Ecosystem in the country and facilitate wider proliferation and innovation in the sector. Three webinars were organized as part of this series in the reporting period
- m) TSDSI conducted various capacity building sessions on TSDSI and Global SDOs as part of NTIPRIT Induction Trainings and NICF Trainings for Officers.

iii. TSDSI at a Glance:



CHAPTER 4
OFFICES AND FIELD ORGANISATIONS

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OFFICES AND FIELD ORGANISATIONS

4.1 WIRELESS PLANNING AND COORDINATION

4.1.1 INTRODUCTION:

The Wireless Planning and Coordination Wing (WPC Wing) of DoT is the nodal agency of Govt. of India for management and planning of radio frequency spectrum in the Country. Licenses for various types of wireless equipments are granted by WPC wing under the provisions of Indian Telegraph Act 1885 and Indian Wireless Telegraphy Act 1933. International coordination for spectrum management, associated satellite orbit, Geo-Stationery Satellite Orbit (GSO)/Non-Geo-Stationery Satellite Orbit (NGSO) are also administered under the provisions of the above Acts. The Wireless Monitoring Organization (WMO) is the field office of WPC wing of DoT. The major functions of WPC Wing and are derived from the Radio Regulation of the International Telecommunication Union including monitoring/measurement of Radio Spectrum usage, ensure interference free radio-communication environment in the country.

4.1.2 SATELLITE BASED LICENCING:

Satellite Licensing section of WPC Wing is responsible for issue of frequency assignments for setting up of earth stations/ VSATs 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 etc.

i. Frequency assignments for VSATs:

Satellite section issues frequency assignment for various VSAT based application such as Commercial VSAT, Captive VSAT, NLD, ILD, IFMC etc. Applications for VSAT based Satellite connectivity are mentioned below.

- a) Cellular Backhauling.
- b) Connectivity of ATMs of Commercial Banks
- c) Providing internet on Aircraft or vessels/ Ships.
- d) Remote Village Wi-Fi connectivity / Last Mile connectivity.
- e) Connectivity for Disaster Management Projects, Seismic, Tsunami Warning, Avalanche Monitoring projects.
- f) River monitoring, Canal monitoring, water management.
- g) Connectivity of State load dispatch center for Solar, Wind power project, Hydro Individual power producers.
- h) Connecting offshore Platforms/ Rigs.
- i) Secure and Independent private network.

For the period 01/04/2022 to 30/11/2022, satellite section has issued frequency assignment of 770 MHz of bandwidth on various Indian as well as foreign satellites, which includes bandwidth for setting up new earth Station as well as additional bandwidth on already operating earth stations. The details of no of new stations permitted/ renewed and frequency assignment issued are as under: -

- a. New Wireless License Scheduled issued- 25982
- b. No. of Licenses Scheduled renewed- 34
- c. No of New frequencies cases assigned- 24

ii. Frequency assignments for Data Collection Platform Network:

Satellite section issues frequency assignments 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:

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

For the period 01/04/2022 to 30/11/2022, satellite section has issued frequency assignment of setting up 61 new earth Station as well as additional bandwidth on already operating earth stations. The details of no of new stations permitted/ renewed and frequency assignment issued are as under: -

- a. New Wireless License Scheduled issued- 61
- b. No. of Licenses Scheduled renewed-17
- c. No of New frequencies cases assigned- 3

iii. Frequency assignments for Broadcasting Networks: -

Satellite section has issued frequency assignments for various Broadcasting type of licenses including Teleport, DTH, HITS, DSNG, etc. and for permission for operation of TV Channel up linking have been issued to service providers/users/departments.

For the period 01/04/2022 to 30/11/2022, satellite section has issued frequency assignment of 73 MHz of bandwidth on various Indian as well as foreign satellites for Teleport Licenses, 824 MHz bandwidth for DTH services, 3 MHz of new bandwidth has been assigned for DSNG services. The details of no of new stations permitted/ renewed and frequency assignment issued are as under: -

- a) For Teleport licenses: -
 - 1. New Wireless License Scheduled issued- 07
 - 2. No. of Licenses Scheduled renewed- 96

3. No of New frequencies cases assigned- 07
- b) For DTH licenses: -
 1. New Wireless License Scheduled issued- 02
 2. No. of Licenses Scheduled renewed- 05
 3. No of New frequencies cases assigned- 02
- c) For DSNG licenses: -
 1. New Wireless License Scheduled issued- 01
 2. No. of Licenses Scheduled renewed- 48
 3. No of New frequencies cases assigned- 01
- iv. No of Endorsement Issued in respect to various licenses: -
 - a) Inflight Mobile Connectivity (IFMC): - A total no of 304 vessels and 669 aircrafts have been permitted to provide IFMC services in Indian by Satellite section for the period 01/04/2022 to 30/11/2022. In total 503 no of vessels and 1332 aircrafts have been permitted for providing IFMC services.
 - b) TV Channels: - A total no of 130 new TV channels has been endorsed under various teleport licenses during the period 01/04/2022 to 30/11/2022 for providing timely broadcasting facilities to general public.
 - c) Remote VSAT Stations: - During the period 01/04/2022 to 30/11/2022 a total no of 25,767 remote stations has been endorsed in various VSAT Licenses to provide good network connectivity in the existing network.
- v. The minimum data rate limit on TV channels has been done away with by the satellite section. Also the requirement of obtaining the wireless operating license in case of remote stations has also been done away with.

4.1.3 SATELLITE COORDINATION:

Introduction: 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.

- i. Satellite Coordination with other Administrations: Coordination proposal have been sent to various administrations for coordination of INSAT-C-Y17(97.3E), INSAT-META(74E), INSAT-METB(82E), INSAT-METD(93.5E), INSAT-NAVR(129.5) and LMI satellite networks of India. Coordination of MTG_EUM series satellite networks of Germany with INSAT series satellite networks of India, in the frequency band 402.5 – 402.85 MHz and 406 – 406.1 MHz was completed. Coordination of QZSS-GS-A

series satellite networks of Japan at 123E, 127E, 137E & 168E with Indian satellite networks was also agreed.

ii. Satellite filings submitted to ITU for publication in BR IFIC (Total: 25 Nos):

New Filings	API: IDRSS-ISL-42.5E, IDRSS-ISL-240E, PS4OP, AZAADISAT, HSPI(MOD) and THYBOLT.Planned band (AP30B): INSAT-KUP-FSS-Y22(55E), INSAT-KUP-FSS-Y22(68E) and INSAT-KUP-FSS-Y22(85.5E)
Notification(PART I-S)	HYSIS, SNI, RISAT-2B, RISAT-2BR, IRS-NG14, IRS-SCATSAT-1, IUSAT-H2, INSAT-KU17(48E), INS-2, INSPIRESAT-1 and INSAT-EHFL-55EPlanned band(AP30/30A/30B): INSAT-KUP-FSS(97.3E), INSAT-KUP-BSS(83E), INSAT-KUP-FSS(74E), INSAT-PKU63E and INSAT-KUP-FSS(93.5E)

iii. Coordination with ITU: Details of Special Sections published in BR International Frequency Information Circular (IFIC) is provided as below:

a) Notification & Due Diligence for Indian Satellite networks:

		Notification		Due Diligence
Month	Part I-S	Part III-S	Part II-S	RES 49
Jan-22	INSAT-NAVR (129.5)DSM1INSAT-META(74E), INSAT-METB(82E) INSAT-METD (93.5E)	INSAT-NAVR (129.5)INSAT-C-Y17(97.3E) LMI	LMI	INSAT-META(74E) INSAT-METD(93.5E)
Feb-22	INSAT-EXC(82E), INSAT-EXC(48E) INSAT-EXC55E INSAT-EXC(129.5E)		INSAT-EXC(82E), INSAT-EXC(48E) INSAT-EXC55E INSAT-EXC (129.5E)	INSAT-EXC(82E) INSAT-EXC(48E) INSAT-EXC (129.5E)
Mar-22		INSAT-METB(82E)	INSAT-KU12(63)E INSAT-METB(82E)	
Apr-22	INSAT-KA68E RISAT-2B RISAT-2BR	INSAT-META(74E)	INSAT-META(74E)	INSAT-KUP-BSS(83E) (MOD) (AP30/AP30A)
May-22	IUSAT-H2 IND-SATS-93.5EHYSIS, IRS-NG14 INSPIRESAT-1			INSAT-KU17(48E)

Jun-22	IRS-SCATSAT-1 SNIINS-2		IUSAT-H2	INSAT-EHFL-55E
July-22	INSAT-KUP-FSS(97.3E) INSAT-KUP-BSS(83E) (AP30/30A)	INSAT-METD(93.5E) IRS-NG14 IRS-SCATSAT-1	INSAT-METD(93.5E), RISAT-2B, RISAT-2BR, HYSIS, INSPIRESAT-1, INSAT-META(74E), INSAT-METB(82E) INSAT-KUP-FSS(97.3E) IRS-NG14 IRS-SCATSAT-1	INSAT-KUP-FSS(97.3E)
Aug-22	INSAT-KUP-FSS(74E), INSAT-KU17(48E) INSAT-EHFL-55E	IND-SATS-93.5E INS-2	SNI INS-2 INSAT-KUP-FSS(74E) RISAT-2B, RISAT-2BR, HYSIS INSPIRESAT-1	INSAT-KUP-FSS(74E)
Sept-22				
Oct-22	INSAT-NAVR (129.5)LMI			
Nov-22	INSAT-METD(93.5E), INSAT-METB(82E) INSAT-META(74E)	INSAT-EHFL-55E	IRS-SCATSAT-1	

b) Coordination request Filings for Indian Satellite networks:

Month	CR/C	CR/D	CR/E
Jan-22			
Feb-22	IDRSS-NPB-42.5E IDRSS-NPB-240E	INSAT-KA93.5 ER, INSAT-KA89 ER, INSAT-KA77.1 ERINSAT-KA48ER	INSAT-KA93.5 ER, INSAT-KA89 ER, INSAT-KA77.1 ER INSAT-KA48ER
Mar-22			

Apr-22	INSAT-KA68E (MOD)		
May-22			
Jun-22			
Jul-22			
Aug-22		IDRSS-NPB-42.5 EIDRSS-NPB-240E	IDRSS-NPB-42.5 EIDRSS-NPB-240E
Sept-22			
Oct-22			
Nov-22	INSAT-KU17(48E) (MOD), INSAT- KU17(55E) (MOD), INSAT-KU17(74E) (MOD), INSAT- KU17(83E) (MOD), INSAT-KU17(93.5E) (MOD) INSAT- KU17(111.5E)(MOD)		

c) Advance Publication of Information for Indian Satellite networks:

Month	API/A	API/B	API/C
Jan-22	ADITYA (MOD)	LMI3	IDRSS-NPB-42.5 EIDRSS-NPB-240E
Feb-22	IDRSS-ISL-42.5 EIDRSS-ISL-240E	OCEANSAT-3	
Mar-22			
Apr-22			
May-22		INS-2	
Jun-22			
Jul-22		ADITYA (MOD) IDRSS-ISL-42.5E IDRSS-ISL-240E	
Aug-22	PS4OP		
Sept-22	AZAADISAT		
Oct-22	HSPI (MOD)		
Nov-22			

iv. Notification & Due-Diligence for Indian Satellite networks (Total: 79 Nos.):

- a) Special Section Part I-S published : 30 Nos
- b) Section Part II-S published : 27 Nos
- c) Special Section Part III-S published : 11 Nos
- d) Due-Diligence published : 11 Nos.

v. Coordination request Filings for Indian Satellite networks (Total: 21 Nos.):

- a) Special Section CR/C published : 09 Nos
- b) Special Section CR/D published : 06 Nos
- c) Special Section CR/E published : 06 Nos

vi. Advance Publication of Information for Indian Satellite networks (Total: 14 Nos.):

- a) Special Section API/A published : 06 Nos
- b) Special Section API/B published : 06 Nos
- c) Special Section API/C published : 02 Nos

vii. BSS Plan as per Appendix-AP30/30A & FSS Plan as per Appendix 30B (Total: 13 Nos.):

FSS plan band (AP30B) A6B and Notification filings in respect of INSAT-EXC(82E), INSAT-EXC(48E), INSAT-EXC55E, INSAT-EXC(129.5E), INSAT-KUP-FSS(97.3E) and INSAT-KUP-FSS(74E) satellite networks submitted to ITU have been published by ITU in BRIFIC. A new FSS plan band (AP30B) filings in respect of IDRSS-PFSS-240E satellite network submitted to ITU has also been published by ITU in BRIFIC.

FSS plan band (AP30B) A6B and Notification filings in respect of INSAT-PKU63E and INSAT-KUP-FSS(93.5E) satellite networks and three new FSS plan band (AP30B) filings have been submitted to ITU. These filings are expected to be published by ITU in BRIFIC in next few months.

BSS plan band (AP30/AP30A) Notification for INSAT-KUP-BSS(83E) was submitted to ITU and has been published by ITU in BRIFIC.

viii. Protection of Indian space and Radio Astronomy Service from the satellite networks of other countries. (Total Objections: 307)

Special Section Published in BRIFIC	Administrations whose satellite networks were objected in view of existing and planned Indian satellite networks.
API/A (70 Objections)	Canada, China, Columbia, Czech Republic, Germany, Italy, Japan, Monaco, Norway, PNG, Poland, Rwanda, Spain, Switzerland, Turkey, UK and USA

CR/C(181 Objections)	Australia, Azerbaijan, Bolivia, Canada, China, France, Germany, Indonesia, Iran, Japan, Korea, Luxembourg, Malaysia, Netherlands, Norway, Oman, Pakistan PNG, Qatar, Russia, Rwanda, Spain, Thailand, Turkey, UAE, UK, USA and Vietnam
Part I-S (16 Objections)	Australia, China, France, Germany, Japan, Russia, Solomon Islands, Thailand, Turkey and USA
Part II-S(04 Objections)	France, Korea, Pakistan and USA
AP30B (31 Objections)	China, Cyprus, France, Germany, Israel, Japan, Korea, Malaysia, Netherlands, Pakistan, Sweden, UAE and UK
AP30/30A (05 Objections)	China, France and Malaysia

4.1.4. Overview of Spectrum Auction-2022

- i. Auction of Spectrum in 600 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz Bands:
 - a) To improve the existing telecom services and to introduce 5G services in the country, Government had conducted auction of spectrum in different spectrum bands in the month of July-2022.
 - b) In the auction, a total of 72097.85 MHz of access spectrum in various frequency bands viz 600 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz, and 26 GHz Bands, pan India across the 22 LSAs, was put to auction with a total reserve price value of Rs. 4,31,605 crores.
 - c) In this auction, apart from 3 incumbent Telecom Service Providers (TSPs) viz M/s Bharti Airtel Limited, M/s Reliance Jio Infocomm Ltd and M/s Vodafone Idea Ltd, a new TSPs namely M/s Adani Data Networks Ltd was participated and acquired spectrum.
 - d) The bidding took place for the spectrum in the 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2500 MHz, 3300 MHz and 26 GHz bands. During the auction no spectrum was sold in the 600 MHz and 2300 MHz bands. A total quantum of 51236.2 MHz of spectrum with a total value of Rs. 150173.3 crores was acquired by the Telecom Service Providers in the auction. The details of the quantum acquired by the bidders and the corresponding price are as tabulated below.

Bidder	Total Quantity (in MHz) in various band/ LSA combination	Total amount (Crore in Rs.)
Reliance Jio Infocomm Limited	24740	88077.615
Bharti Airtel Limited	19867.8	43084.3792
Vodafone Idea Limited	6228.4	18799.3
Adani Data Networks Ltd	400	212
Total	51236.2	150173.3

e) Upon completion of Spectrum auction, Demand Notices to the successful bidders were issued on 05.08.2022 to make due payments on or before 17-08-2022. The harmonization exercise was carried out parallelly to make spectrum contiguous and upon receipt of due payments from TSPs on 17-08-2022, the frequency assignment letters were issued on same day i.e. 17.08.2022. Issuance of frequency assignment letters on the same day was largely appreciated by industry.

ii. Guidelines for allotment of E-band carriers:

Government has issued guidelines on 25-07-2022 to allot a maximum of 2 (two) carriers of 250 MHz each (paired) bandwidth in E-band (71-76/81-86) GHz to TSPs, for their backhaul purpose in the LSAs where they are holding Access Spectrum in IMT bands.

iii. Enhancement in the limit of Microwave carriers (MWA):

In view of the increased requirements of backhaul on account of 5G service, Government has increased the limit of maximum number of Microwave Access carriers that can be assigned to a Telecom Service Provider with Access Service authorization/license on provisional basis vide Guidelines dated 16.10.2015, from existing 4 carriers (in Metro, Cat 'A' LSA) /3 carriers (in Cat 'B' & Cat 'C' LSA) to 8 carriers (in Metro, Cat 'A' LSA) / 6 carriers (in Cat 'B' & Cat 'C' LSA). In this regard the addendum to the guidelines dated 16-10-2015 was issued on 25.07.2022.

iv. Guidelines for Spectrum leasing to Captive Non-Public Networks (CNPN).

After considering the TRAI Recommendations on the "Auction of spectrum in frequency bands identified for IMT/5G" dated 11.04.2022, the Government has decided that enterprises setting up Captive Private Networks may obtain the spectrum on lease from the Telecom Service Providers, having Access Service License. In this regard the guidelines containing necessary provisions of spectrum leasing was issued on 27.06.2022

v. Revised guidelines for the surrender of administratively assigned spectrum to Telecom Service Providers (TSPs) with Access Service Authorisation:

Considering the ease of doing business, Government has issued the guidelines vide OM no. No. L-14042/01/2022-IMT dated 10-11-2022 for the surrender of administratively assigned spectrum to Telecom Service Providers (TSPs) with Access Service Authorisation. As per the guidelines, the requirement of updated payment for surrendered carrier has been done away and provisioning of completion of surrender process within 30 calendar days from receipt of application.

4.1.5. Terrestrial Broadcasting and Licencing

(Frequency Assignments above 806 MHz):

Sl.No.	Item	Achievements		
		Actual		Anticipated
		2021-2022	01/04/2022 to 31/10/2022	01/11/2022 to 31/03/2023
1	New Radio Frequencies Agreed to various users	264	130	140
2	Inter Deptt. Meeting	23	15	12
3	No. of Wireless station license Schedule issued	205	1003	1000
4	No. of Wireless station license Schedule renewed	15963	46	3200*
5	Radio frequency assignment for VVIP visits	09	05	02

* Upon completion of migration which is under process.

4.1.6. SACFA Siting Clearance;

- i. The SACFA siting applications processed and acceptance issued during the period 2022-23 through SARAL Sanchar portal are as tabulated below:

Sl.No.	Item	Achievements		
		Actual		Anticipated
		2021-2022	01.04.2022 to 25.11.2022	25.11.2022 to 31.03.2023
1	No of SACFA applications processed & Acceptance No. issued.	658891	842905	421452

- ii. To further improve the ease of doing business, the requirement for a formal application for SACFA processing is done away with Low Power BTSs and the TSPs only need to register the details on the SARAL Sanchar Portal. The SACFA registrations fee for such cases shall be charged @Rs.100/- per small cell.
- iii. Further, for “additional antenna” category of SACFA siting clearance cases, the SACFA processing fee has been reduced to Rs.100/- per additional antenna from the earlier processing fee of Rs.1000/- per additional antenna.

4.1.7 International Spectrum Regulation

WPC Wing, DoT is national nodal agency on all matters related to radio frequency spectrum

management. WPC Wing carries out International Radio Spectrum Management, while contributing in revision of ITU's Radio Regulations (International treaty). Further, revision of National Frequency Allocation Plan (NFAP) is also undertaken by WPC Wing which is based on national priorities and ITU's Radio Regulations.

i. India's Candidature for Council Member and Member, Radio Regulations Board (RRB) of ITU:

India is re-elected in ITU Council with the second highest votes and India's candidate Ms. Revathi Mannepallih has been elected as a Member of the Radio Regulations Board with the highest votes from Region E, at the ITU Plenipotentiary Conference held in Bucharest, Romania from 24th Sept to 14th Oct 2022.

ii. Release of National Frequency Allocation Plan 2022

The last NFAP 2018 has been reviewed/ revised in consultation with stakeholders and on the lines of ITU Regulations 2020 and the National Frequency Allocation Plan (NFAP) 2022 was unveiled by Hon'ble Minister of Communications Shri Ashwini Vaishnav on 26.10.2022. The NFAP is a central policy roadmap that defines future spectrum usage by all bodies in the country including DoT, Department of Space, Defence, and I&B ministries, among others. It is a master document for spectrum allocation and planning for the industry as well as policymaking.



The National Frequency Allocation Plan (NFAP) 2022 was unveiled by Hon'ble Minister of Communications Shri Ashwini Vaishnav along with Smt. Meenakashi Lakhi Hon'ble Minister of State for External Affairs.

iii. Coexistence studies in 500 MHz, C-band, and mm-Wave band

To address the concern of MIB regarding possible interference/ disruption in Cable & Satellite (C&S) services due to the identification of the frequency band of 3.3-3.67 GHz for IMT implementation, CEWiT, IIT Madras was requested to carry out a coexistence study in C-band & Ka-band. Based on the analysis of the study report submitted by CEWiT, MIB was requested to issue an advisory to all DTH/HITS/MSOs, etc. to install bandpass filters and

LNBs with narrow band filters to restrict their reception within the 3700-4200 MHz range. Thereafter successful 5G auctions were held.

- iv. Precautionary Operating Procedure for Installation of C-band 5G transmission equipment around airports in India

Precautionary measures/ instructions regarding the safe installation of 5G base stations near airports to be followed by Telecom Service Providers; have been taken up and finalized in coordination with the Airport Authority of India & Director General of Civil Aviation. A letter on safety measures to be adopted by Telecom Service Providers regarding C band radio altimeter vs. C-band 5G spectrum has been issued on 29.11.2022.

- v. Participation of Indian delegations in important international events

ITU and APT meetings/ events held in hybrid mode (Physical & virtual) have been participated actively by DoT delegates. Event-wise participation in ITU/ APT meetings is summarised in Tables.

S. No.	DoT delegations deputed for International E-meetings w.r.t. Radiocommunication (1-4-2022 to 30.11-2022)		Number of meetings attended.
1.	ITU Meetings	Spectrum Management	04
2.		Radiowave Propagation	04
3.		Satellite Services	04
4.		Terrestrial Services	07
5.		Broadcasting Services	04
6.		Science Services	04
7.		Other meetings viz. WRC Preparations	07
8.	APT Meetings	Asia Pacific Telecommunity (APT)	04
		Total	34

S. No.	Major milestones of International E-meetings w.r.t. Radiocommunication (1-4-2022 to 31-12-2022)	Number
1	DoT delegates deputed (Remote and Physical)	147
2	Non-DoT (Govt.) delegates included in DoT delegation	76
3	Non-DoT (Pvt.) delegates included in DoT delegation	44
4	Preparatory Meetings held	04
5	Contribution documents submitted to ITU and APT meetings	17

vi. Brief details of participation in international meetings w.r.t. radio communications during 01.04.2022 to 30.11.2022.

a) Spectrum Management: Spectrum management principles and techniques, general principles of sharing, spectrum monitoring, long-term strategies for spectrum utilization, economic approaches to national spectrum management, automated techniques and assistance to developing countries. ITU-R Study Group 1 and its related Working parties deal with Spectrum management and its participation details are given below:

Meeting/event name and date	Brief about Indian contribution/participation
Working Party 1A (Spectrum Engineering Technique)	Spectrum engineering techniques Including unwanted emissions, frequency tolerance, technical aspects of sharing, spectrum engineering, computer programs, technical definitions, Earth-station coordination areas and technical spectrum efficiency. <i>Indian delegation participated in the WP 1A during 04 July to 08 July 2022</i>
04.07.2022 to 08.07.2022	
Working Party 1B (Spectrum management methodologies and economic strategies)	Spectrum management fundamentals including economic strategies, spectrum management methodology, national spectrum management organization, national and international regulatory framework, alternative approaches, flexible allocations and long-term strategies for planning. <i>Indian delegation participated in the WP 1B during 04 July to 08 July 2022</i>
04.07.2022 to 08.07.2022	
Working Party 1C (Spectrum Monitoring)	Spectrum monitoring Including the development of techniques for observing the use of the spectrum, measurements techniques, inspection of radio stations, identification of emissions and location of interference sources <i>Indian delegation participated in the WP 1C during 04 July to 08 July 2022 (03 delegates) and remotely participated during 28 June to 07 July 2022</i>
28.06.2022 to 07.07.2022	
04.07.2022 to 08.07.2022	

b) Radiowave Propagation: Propagation of radio waves in ionized and non-ionized media and the characteristics of radio noise, for the purpose of improving radio communication systems. ITU-R Study Group 3 and its related Working parties deal with Spectrum management and its participation details are given below:

Meeting/event name and date	Brief about Indian contribution/participation
Working Party 3J (Propagation fundamentals)	Propagation fundamentals WP 3J provides information and develops models describing the fundamental principles and mechanisms of radiowave propagation in non-ionized media. Such material is used as the basis of propagation prediction methods developed by the other Working Parties. Recognizing the natural variability of the propagation medium. <i>Indian delegation participated in the WP 3J during 30 May to 10 June 2022</i>
30.05.2022 to 10.06.2022	
Working Party 3K (Point-to-area propagation)	Point-to-area propagation WP 3K is responsible for developing prediction methods for terrestrial point-to-area propagation paths. In the main, these are associated with terrestrial broadcasting and mobile services, short-range indoor and outdoor communication systems (e.g. radio local area networks, RLAN), and with point-to-multipoint wireless access systems. <i>Indian delegation participated in the WP 3J during 30 May to 10 June 2022</i>
30.05.2022 to 10.06.2022	
Working Party 3L (Ionospheric propagation and radio noise)	Ionospheric propagation and radio noise WP 3L studies all aspects of radiowave propagation in and through the ionosphere. Recommendations are maintained describing, in mathematical terms, a reference model of ionospheric characteristics and maximum usable frequencies associated with the various ionospheric layers. <i>Indian delegation participated in the WP 3J during 01 June to 10 June 2022</i>
01.06.2022 to 10.06.2022	
Working Party 3M (Point-to-point and Earth-space propagation)	Point-to-point and Earth-space propagation WP 3M addresses radiowave propagation over point-to-point terrestrial paths and Earth-space paths, both for wanted and unwanted signals. For terrestrial paths, prediction methods are developed for both line-of-sight and over-the-horizon links, taking into account the possible mechanisms that can give rise to fading and distortion of the wanted signal. <i>Indian delegation participated in the WP 3J during 01 June to 10 June 2022</i>
30.05.2022 to 10.06.2022	

- c) Satellite Services: Systems and networks for the fixed-satellite service, mobile-satellite service, broadcasting-satellite service and radiodetermination-satellite service. ITU-R Study Group 4 and its related Working parties deal with Satellite Services and its participation details are given below:

Meeting/event name and date	Brief about Indian contribution/participation
<p>Working Party 4A</p> <p>11.05.2022 - 20.05.2022</p> <p>14.09.2022 to 22.09.2022</p>	<p>Efficient orbit/spectrum utilization for the fixed-satellite service (FSS) and broadcasting-satellite service (BSS) The major study areas of Working Party 4A are orbit/spectrum efficiency, interference and coordination and related aspects for FSS and BSS. Its work has significant relevance to the preparatory work for World Radiocommunication Conferences. <i>Indian delegation remotely participated in the WP4A E-meeting during 11 May to 20 May 2022(06 delegates) and 14 September to 22 September 2022.</i></p>
<p>Working Party 4B</p> <p>09.05.2022 - 13.05.2022</p>	<p>Systems, air interfaces, performance and availability objectives for the fixed-satellite service (FSS), broadcasting-satellite service (BSS) and mobile-satellite service (MSS), including IP-based applications and satellite news gathering (SNG) Working Party 4B carries out studies on performance, availability, air interfaces and earth-station equipment of satellite systems in the FSS, BSS and MSS. This group has paid particular attention to the studies of Internet Protocol (IP)-related system aspects and performance and has developed new and revised Recommendations and Reports on IP over satellite to meet the growing need for satellite links to carry IP traffic. This group has close cooperation with the ITU Telecommunication Standardization Sector <i>Indian delegation remotely participated in the WP4B E-meeting during 09 May to 13 May 2022 .</i></p>
<p>Working Party 4C</p> <p>04.05.2022 - 10.05.2022</p>	<p>Efficient orbit/spectrum utilization for the mobile-satellite service (MSS) and the radiodetermination-satellite service (RDSS) Studies conducted within Working Party 4C are aiming at a more efficient use of the orbit/spectrum resources by MSS and RDSS systems. This includes analyzing various interference situations between such systems but also with systems operating in other radiocommunication services, developing coordination methodologies, describing the potential use of MSS and RDSS systems for specific purposes like emergency situations, maritime or aeronautical telecommunications, time distribution, etc. <i>The Indian delegation remotely participated in the WP4C E-meeting during 04 – 10 May 2022.</i></p>

- d) Terrestrial Services: Systems and networks for fixed, mobile, radiodetermination, amateur and amateur-satellite services. ITU-R Study Group 5 and its related Working parties deal with Terrestrial Services and its participation details are given below:

Meeting/event name and date	Brief about Indian contribution/participation
Working Party 5A	Land mobile service excluding IMT; amateur and amateur-satellite service WP 5A is responsible for studies related to the land mobile service, excluding IMT and including wireless access in the fixed service, and is also responsible for studies related to the amateur and amateur-satellite services <i>Indian delegation participated in the WP5A meeting during 26 May to 03 June 2022.</i>
26.05.2022-03.06.2022	
Working Party 5B	<u>Maritime mobile service including the Global Maritime Distress and Safety System (GMDSS); the aeronautical mobile service and the radiodetermination service</u> WP 5B is responsible for studies related to the maritime mobile service, including the Global Maritime Distress and Safety System (GMDSS), the aeronautical mobile service and the radiodetermination service, including both radiolocation and radionavigation services. <i>Indian delegation remotely participated in the WP5B E-meeting during 29 March to 08 April 2022 (07 delegates) and physically participated during 11 – 22 July 2022.</i>
11.07.2022 - 22.07.2022	
Working Party 5C	Fixed wireless systems; HF systems in the fixed and land mobile services WP 5C is responsible for studies related to fixed wireless systems and HF systems in the fixed and land mobile services. It studies performance and availability objectives, interference criteria, RF channel/block arrangements, system characteristics and sharing feasibility. <i>Indian delegation participated in the WP5A meeting during 26 May to 03 June 2022.</i>
26.05.2022-03.06.2022	
Working Party 5D	IMT Systems WP 5D is responsible for the overall radio system aspects of International Mobile Telecommunications (IMT) systems, comprising IMT-2000, IMT-Advanced, IMT-2020 and IMT for 2030 and beyond. <i>Indian delegation participated in the WP5D meeting during 19 – 22 April (interim) (Physical: 03 delegates & remote: 04 delegates), 13 – 24 June 2022 (04 delegates remotely) and 10-21 October 2022.</i>
19.04.2022 - 22.04.2022	
13.06.2022 - 24.06.2022	
10.10.2022 to 21.10.2022	

- e) Broadcasting Service : Radiocommunication broadcasting, including vision, sound, multimedia and data services principally intended for delivery to the general public. ITU-R Study Group 6 and its related Working parties deal with Broadcasting Service and its participation detail are given below:

Meeting/event name and date	Brief about Indian contribution/participation
Working Party 6A	<i>Terrestrial broadcasting delivery WP6A covers the activities in the area of terrestrial system characteristics, channel coding/decoding, modulation/demodulation, frequency planning and sharing for sound, video, multimedia and interactivity, characteristics of transmitting and receiving antennas and evaluation methods of service areas, transmitter and receiver reference performance requirements, requirements for source coding for terrestrial emission and requirements for metadata in terrestrial broadcasting. WP 6A is contributory group for WRC-23 agenda items 1.4, 1.12, 9.1(a) and (c). Indian delegation remotely participated in the Working Party 6A during 19-30 September 2022.</i>
19.09.2022 to 30.09.2022	
Working Party 6B	<i>Broadcast service assembly and access WP 6B covers the activities in the area of interfaces in the production chain and via/to the various delivery media (terrestrial, satellite, cable, internet, etc.), source coding and multiplexing/demultiplexing of content, metadata, middleware, service information, and access control, for all broadcasting services including multimedia/interactive and converged services, both fixed and mobile terminals. WP 6B is also responsible for requirements for ENG and broadcasting satellite services. In other words, WP 6B is responsible for any areas bridging programme production and broadcasting emission. Indian delegation remotely participated in the Working Party 6B during 19-30 September 2022.</i>
19.09.2022 to 30.09.2022	
Working Party 6C	Programme production and quality assessment WP 6C studies and develops issues associated with what is termed the “presentation layer” for radio and television broadcasting. This includes signal formats for the making and exchange of television and radio programmes, and also ways to evaluate picture and sound quality that are a critical element in the choice of the parameters for the “presentation layer” end-to-end. Indian delegation remotely participated in the Working Party 6B during 19-30 September 2022.
19.09.2022 to 30.09.2022	

Study Group-6 (SG-6)	Broadcasting Service Radiocommunication broadcasting, including vision, sound, multimedia and data services principally intended for delivery to the general public. <i>Indian delegation remotely participated in the Working Party 6B during 19-30 September 2022.</i>
19.09.2022 to 30.09.2022	

- f) Science Services: Systems for space operation, space research, Earth exploration and meteorology, including the related use of links in the inter-satellite service. Systems for remote sensing, including passive and active sensing systems, operating on both ground-based and space-based platforms. Radio astronomy and radar astronomy. Dissemination, reception and coordination of standard-frequency and time-signal services, including the application of satellite techniques, on a worldwide basis. ITU-R Study Group 7 and its related Working parties deal with Science Services and its participation detail are given below:

Meeting/event name and date	Brief about Indian contribution/participation
Study Group 7 (Science Services)	<u>Science Services</u> Systems for space operation, space research, Earth exploration and meteorology, including the related use of links in the inter-satellite service. Systems for remote sensing, including passive and active sensing systems, operating on both ground-based and space-based platforms. Radio astronomy and radar astronomy. Dissemination, reception and coordination of standard-frequency and time-signal services, including the application of satellite techniques, on a worldwide basis.
Working Party 7A	<u>Time signals and frequency standard emissions</u> WP 7A covers standard frequency and time signal services, both terrestrial and satellite. Its scope includes the dissemination, reception and exchange of standard frequency and time signals and coordination of these services, including the application of satellite techniques on a worldwide basis. <i>Indian delegation remotely participated in the WP 7A E-meeting during 02 to 06 May 2022</i>
02.05.2022 - 06.05.2022	
Working Party 7B	Space radiocommunication applications WP 7B is responsible for the transmission and reception of telecommand, tracking and telemetry data for space operation, space research, Earth exploration-satellite, and meteorological satellite services. It studies communication systems for use with manned and unmanned spacecraft, communication links between planetary bodies and the use of data relay satellites. <i>Indian delegation remotely participated in the WP 7B E-meeting during 26 April to 05 May 2022.</i>
26.04.2022-05.05.2022	

Working Party 7C	Remote sensing systems WP 7C covers remote sensing applications in the Earth exploration-satellite service (EESS), both active and passive, systems of the MetAids service, as well as ground based passive sensors, space weather sensors and space research sensors, including planetary sensors. <i>Indian delegation remotely participated in the WP 7C E-meeting during 26 April to 05 May 2022.</i>
26.04.2022-05.05.2022	
Working Party 7D	Radio astronomy
	WP 7D covers the radio astronomy service. Its scope includes radio astronomy and radar astronomy sensors, both Earth-based and space-based, including space very long baseline interferometry (VLBI). <i>Indian delegation remotely participated in the WP 7D E-meeting during 25 – 29 April 2022.</i>
25.04.2022 - 29.04.2022	

g) Other meetings viz. WRC preparations:

Meeting/event name and date	Brief about Indian contribution/participation
Radio Advisory Group (RAG)	The principal duties of the RAG are, inter alia, to review priorities, programmes, operations, financial matters and strategies related to Radio Communication Assemblies, Study Groups and the preparation of Radiocommunication Conferences, and any specific matters as directed by a conference of the Union, a Radiocommunication Assembly or the Council. <i>Indian delegation participated in the RAG meeting during 11-14 April 2022.</i>
11.04.2022 to 14.04.2022	
World summit on Information Society (WSIS) Forum 2022	The World Summit on the Information Society Forum 2022 represents the world's largest annual gathering of the ICT for development community. The WSIS Forum 2022 started from 15 March onwards in a virtual format with the final week being held physically with enhanced remote participation from 30 May to 3 June 2022 at the ITU Headquarters in Geneva, Switzerland, under the theme of ICTs for Well-Being, Inclusion and Resilience: WSIS Cooperation for Accelerating Progress on the SDGs. <i>Indian delegation participated in the WSIS meeting during 30 May to 03 June 2022.</i>
30.05.2022 to 03.06.2022	

World Telecommunication Development Conference (WTDC)	The International Telecommunication Union, through its Telecommunication Development Bureau (BDT), organizes a World Telecommunication Development Conference (WTDC) in the period between two Plenipotentiary Conferences to consider topics, projects and programmes relevant to telecommunication development. WTDCs set the strategies and objectives for the development of telecommunication/ICT, providing future direction and guidance to the ITU Telecommunication Development Sector (ITU-D). <i>Indian delegation participated in the WTDC meeting during 06 June to 10 June 2022.</i>
06.06.2022 to 10.06.2022	
African Telecommunication Union(ATU) meeting	ATU is a specialized agency of the Organisation of African Unity, now African Union, in the field of telecommunications, the African Telecommunications Union (ATU-UAT) took its present name in 1999. This led to the transformation of the agency into a partnership between public and private stakeholders in the Information and Communication Technology (ICT) sector. <i>Indian delegation participated in the ATU meeting during 05 July to 07 July 2022.</i>
05.07.2022 to 26.7.2022	
ITU Plenipotentiary-22 Conference (ITU PP-22)	The International Telecommunication Union (ITU) is the United Nations specialized agency for information and communication technologies (ICTs). The Plenipotentiary Conference (PP), ITU's highest policy making body, meets once every four years to set the Union's general policies, adopt the four-year strategic and financial plans, and elect the senior management team of the organization, the Member States of the council, and the members of the Radio Regulation Board. <i>Indian delegation participated in the ITU PP-22 meeting during 24 September to 03 October 2022.</i>
24.09.2022 to 03.10.2022	
2 nd ITU Inter Regional Workshop on WRC-23 Preparation	The results of the ITU-R studies included in the draft CPM Report to WRC-23 will be presented during the Workshop, as well as the status of regional preparations for CPM23-2, RA-23 and WRC-23. This Workshop will provide participants with the opportunity to gain a better understanding of the possible solutions identified to satisfy the WRC-23 agenda items and topics. It will also facilitate the formal and informal exchange of information on the draft common views, positions and/or proposals of the concerned entities. <i>Indian delegation participated in the ITU Inter-Regional Workshop during 29 November to 01 December 2022.</i>
29.11.2022 to 01.12.2022	

- h) Asia Pacific Telecommunity (APT) meetings: APT has two work programs related to Spectrum Management (i) APT Wireless Group (AWG) (ii) APT preparatory Group for WRC (APG). APT participation details are given below:

Meeting/event name and date	Brief about Indian contribution/participation
APT Plenipotentiary-22-4 meeting (APT PP-22)	APT Preparatory Group for ITU Plenipotentiary Conferences (APT-PP) is to assist the APT Members to prepare for the ITU Plenipotentiary Conferences (ITU PPs) in coordinating issues of regional interest and preparing coordinated regional contributions to the Conference. Over the years, APT-PP is developing APT Common Proposals to ITU PPs considering the interest of the Members. <i>Indian delegation participated in the APT PP-22 meeting during 01 August to 05 August 2022.</i>
01.08.2022 to 05.08.2022	
4th Meeting of the APT Conference Preparatory Group for WRC-23 (APG23-4)	The APT Conference Preparatory Group for World Radio communication Conference (APG) has been developed into one of the most important activities of APT. APG was started in 1996 with the objective of harmonizing views and developing common proposals from the Asia-Pacific region for the World Radio Conference (WRC). <i>Indian delegation participated in the APG23-2 meeting during 15-20 August 2022.</i>
15.08.2022 TO 20.08.2022	
30 th APT Wireless Group (AWG-30)	<i>The APT Wireless Group (AWG) covers various aspects of emerging wireless systems to meet the upcoming digital convergence era in the Asia-Pacific region. It also assists to provide effective radiocommunication solutions and to facilitate the transfer of technology and knowledge. In its 28th meeting, the AWG will report on the progress of its activities and discuss the relevant topics and issues further. Indian delegation participated in the 30th APT Wireless Group (AWG-30) during 05-09 September 2022.</i>
05.09.2022 to 09.09.2022	
APT Training Course on Radio Spectrum Management and Monitoring for Wireless Broadband Infrastructure and IoT (Online Training Course)	APT Training Course on Radio Spectrum Management and Monitoring for Wireless Broadband Infrastructure and IoT (Online Training Course). Indian delegation remotely participated in the APT Training Course on Radio Spectrum Management and Monitoring during 20-28 October 2022.
20.10.2022 to 28.10.2022	

<p><i>23rd Meeting of the South Asian Telecommunication Regulators' Council (SATRC-23)</i></p>	<p>The SATRC meeting is held annually to discuss and coordinate regulatory and other related issues in the area of telecommunication and ICT that are common for the regulators of SATRC Member countries. The meeting is be attended by the Heads of telecommunication regulatory bodies and senior level officials of SATRC Member countries as well as high-level representatives from industry. <i>Indian delegation remotely participated in the SATRC-23 meeting during 14-16 November 2022.</i></p>
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4.1.8. Achievements of Certificate of Proficiency:

- i. Digitalisation of licenses: Under Phase I of SARAL Sanchar project, online modules for processing of fresh license (Radiotelephony – Restricted (RTR) and General Operator Certificate (GOC)) have been launched in SARAL Sanchar portal. Phase II of the project, shall cover the renewal process and integration with other online modules viz. Bharatkosh portal, other ministries portals.
- ii. Extension to validity of CoP licenses during COVID pandemic: For onboarding an aircraft or ship, one should be possessing RTR or GOC license. Due to national lockdown, licensees were unable to renew their licenses. Therefore, it has been decided to grant an extension to validity of CoP licenses (GMDSS-GOC and RTR licenses) for facilitating the continuity of their services.
- iii. Statistical data of CoP licenses:

	Achievement (April 2022 to November 2022)	Anticipated achievement (December 2022 to March 2023)
1. Certificate of Proficiency Examination licenses		
No. of new CoP license issued.	257	130
No. of CoP license renewed.	1115	560
2. Radio Amateur Cell		
No. of new Amateur license issued.	665	330
No. of Amateur license renewed.	62	30
Change of location of station	11	05
Special Call Sign issued	25	12

**4.1.9. Terrestrial Broadcasting and Licensing:
(Frequency assignments Below 806 MHz):**

S. No.	Months Period from April 22 to March 23	Total AIP/DL issued	Total WOL issued	Total Number of schedules issued with WOL	Total WOL Renewed	Total no of scheduled Renewed	Total no of new Freq. Assignment
1	April 22	96	61	3041	206	4900	130
2	May 22	97	191	2292	24	4	116
3	June 22	64	61	1431	152	2	107
4	July 22	29	39	1573	82	0	41
5	August 22	41	43	1387	76	2259	102
6	September 22	80	39	2446	205	4352	46
7	October 22	50	34	3347	285	6557	65
8	November 22	77	53	436	128	3152	97
9	December 22	77	53	436	128	3152	97
10	January 23	77	53	436	128	3152	97
11	February 23	77	53	436	128	3152	97
12	March 23	77	53	436	128	3152	97
13	Total	842	733	17697	1670	33834	1092

4.1.10. Regional Licensing Offices:

There are five Regional Licensing Office (RLO) situated at 4 metro cities and one at Guwahati with their defined jurisdiction. RLOs are entrusted to issue licenses and their renewals in various categories under Section 4 of the Indian Telegraph Act, 1885 viz. Import License, Ultra high frequency (UHF) Short Range Radio (Hand-Held) License, Radio Paging (Captive) License, Maritime Mobile Station License (MMSL), Aeronautical Mobile Station License (AMSL), Radio Controls of Models License, Experimental License, Demonstration License, Certificate of Proficiency for Aero mobile Services-RTR(A), Certificate of Proficiency for Global Maritime and Safety Services(GMDSS).RF devices operating in notified license exempted frequency Band and falling under 'Restricted' category of DGFT Import Policy, scrutiny-based Equipment Type Approval (ETA) and then subsequent import license are also issued from the Regional Licensing Offices (RLOs). Some statistics of RLO Kolkata, Delhi and Mumbai are shown below:

i. RLO Kolkata:

License issued w.e.f. 01.04.2022 to 31.10.2022

1.	Wireless Licenses	Total
1.1	No of License schedule issued	10
1.2	No of License schedule renewed	18
1.3	No. of Import licenses issued	47
1.4	No. of Import license renewed	02
1.5	No. of Experimental License issued/renewed	02/02
1.6	No. of Demo License issued	00
1.7	No. of USR License issued/renewed	02/20
2.	Certificate of Proficiency (COP) Examination Licenses issued.	
2.1	No. of GMDSS(G.O.C) Licenser renewed	333
2.2	No. of candidates admitted in Maritime Mobile Services (GOC) Examination (through ERHQ)	531
2.3	No. of RTR (A) License issued	00
2.4	No. of RTR (A) License renewed	01
2.5	No. of GMDSS(G.O.C) Licenser issued	495
2.6	No. of candidates appeared in RTR (A) License exam	NIL

ii. RLO Delhi:

Annual Statistical Report of RLO (NR), New Delhi for the year 2022-23:

S. No.	License category	Total
1	New assignments	13
2	USR	5
3	USR-Ren	212
4	AMSL	165
5	AMSL-Ren	234
6	Import	454
7	ETA	15
8	RTR (A)	279
9	RTR Ren.	0
10	GMDSS	284

11	GOC Ren.	269
12	Experimental/Demo	58
13	Exp. Ren.	42
14	No. of Candidates appear for GMDSS exam	491
15	No. of Candidates appear for RTR (A) exam	2131
16	MMSL	11
17	MMSL Ren.	1

iii. RLO Mumbai:

S. No.	Type of License	No. of Licenses issued/ renewed from 01.04.2022 till 21.11.2022
1	UHF Short Range	294
2	Import	163
3	Experimental	55
4	Demonstration	1
5	ETA	2
6	Manufacturing & Testing	20
7	Maritime Mobile Station	234
8	Aero Mobile Station	48
9	GMDSS(GOC)	1245
10	RTR(A)	180

4.2 WIRELESS MONITORING ORGANISATION (WMO)

4.2.1 Radio Monitoring — a regulatory and treaty requirement.

Radio monitoring service, a regulatory and treaty requirement, is carried out by the Wireless Monitoring Organisation of the Wireless Planning & Co-ordination Wing (WPC Wing), Ministry of Communications for the Government of India. It is essentially technical in nature and its broad objectives are derived from the international treaty document — *Radio Regulations* of the *International Telecommunication Union*.

4.2.2 Major functions of Wireless Monitoring Organisation (WMO)

The major functions of the WMO are as under:

- i. Resolution of the harmful interference;

- ii. Monitoring for identification of frequency sub-bands for introduction of new services and/or for additional allocation to existing services;
- iii. Monitoring for spectrum recovery — unused/ under-used frequency authorizations;
- iv. Monitoring for ensuring adherence to licensing conditions;
- v. Monitoring / measurements for sharing studies;
- vi. Assistance to domestic wireless users;
- vii. Assistance to foreign administrations;
- viii. Participation in special monitoring campaigns of the International Telecommunication Union;
- ix. Measurements on radio emissions (intentional & non-intentional) for the possible introduction of new radio communication standards, and also for studying the EMC compatibility of the proposed new installations;
- x. Inspection of licensed installations; and
- xi. Monitoring of space emissions to protect authorized satellite transmissions.

4.2.3 Challenges before WMO

The increasing dependence of the society (the Government and the public alike) on the wireless communications demands WMO to ensure interference free radio communication environment. Therefore, WMO's primary focus, at present, is on public mobile radio communication services, public broadcasting services and safety-of-life services.

WMO is earnestly gearing up its resources— manpower and machine-power to ensure that these services continue to operate in interference-free environment. The primary reason for the interference protection to these services lies in their critical importance to the society as a whole. With respect to public mobile cellular service, WMO has twin objectives:

To identify and eliminate the sources of interference occurring due to a multitude of reasons and to find unused spectrum for expansion of 2G, 3G, 4G& 5G services. In so far as public broadcasting is concerned, its transmissions have been found to be affecting aeronautical mobile communications (civil aviation) and also infringing licensing parameters. To address the needs of such crucial services, WMO is in the process of procuring custom-designed radio monitoring products. Beside the service-aspect of radio monitoring, WMO has to ensure the quality of the spectrum.

4.2.4 Wireless Monitoring Organisation continues to provide interference-free wireless services in the increasingly crowded radio environment besides providing vital technical data for the introduction of new services such as 5G, 4G, 3G etc. to WPC Wing. Actual Achievements during 01.04.2022 to 18.11.2022 and anticipated achievements for 19.11.2022 to 31.03.2023 Wireless Monitoring Organisation is given below: -

4.2.5 Monitoring Activities: -

Wireless Monitoring Organization (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 field unit 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 specialised activity, Officers of Indian Radio Regulatory Services (IRRS) are posted in WMO for ensuring interference free spectrum for public telecom services and wireless users. WMO also runs its own Training and Development Centre (T&D Centre) at Ghitori, New Delhi for spectrum monitoring & management related courses. In addition, WMO, with its 10 Inspection Units, carries out physical inspection of wireless installations.

The major achievements and activities in the field of spectrum monitoring within WMO are summarized as under:

4.2.6 Submission of joint survey reports for identification of villages/pockets having low/no mobile coverage lying along border districts of country.

WMO has been entrusted to initiate and lead the joint survey by engaging LSA, TSP and security agencies which is big responsibility. To complete this challenging task in time bound manner, WMO is required to handle the survey in the districts located along the border areas of 16 states and 2 UTs in mission mode. WMO has named this gigantic task as "Mission: Invisible intrusion". The objective of the joint survey is to measure foreign signal spillage and to identify low coverage area/pocket i.r.o. Indian Signal along bordering districts of India. The joint survey has been carried out in area/locations within 10Kms of IB/LoC/LAC.

4.2.7 Co-existence studies between terrestrial and satellite signals.

WMO has conducted co-existence studies between 5G and NAViC by engaging TSP and ISRO. The purpose of this study is to understand the safe keep of distance to protect vital satellite-based establishments getting interfered from upcoming 5G services.

4.2.8 Field study for assessing inter-band Guard band between 800MHz and 900MHz band.

WMO has conducted field study for assessing inter-band Guard band between 800MHz and 900MHz band by engaging telecom service providers in identified circles.

The purpose of this study is to assess possibility of interference in uplink of 900MHZ band due to downlink signals from 800MHz band in revised Channel plan scenario.

4.2.9 Enforcement initiative:

A mechanism for monitoring and inspection is being implemented for resolving interference complaints arising due to unauthorized BOOSTERS in the country. In this mechanism, WMO

team takes action on the spot in presence of District Police authorities and complainant (licensed user) by detecting interfering source through monitoring, imparting awareness to public, serving notices and removal of boosters. This approach has proved to be game changer in dealing with booster related interference cases. Hundreds of unauthorized boosters were removed from people/entities during these exercises and also notices were served on the spot to the users/owners of these boosters. Such exercises have been conducted by WMO Field units for various TSP's in different Telecom circles across India. TSP's have also acknowledged the improvement in their network quality after WMO's action.

Besides taking strong action on the ground against unauthorized boosters creating interference to public telecom networks, WMO has directed its 27 field units across different states of India to ensure that Dealer possession license holder of Wireless equipment should not engage in sale of unauthorized mobile signal boosters.

Further WMO has also issued directions to monitor and detect the e-commerce websites displaying/selling unauthorized mobile signal boosters from their websites. This has been done to curb the influx of unauthorized mobile signal boosters across the country. As much as 137 notices have been served to e-commerce websites involved in display of mobile signal boosters on their websites.

WMO is also issued public notices on DoT website for awareness of common public to refrain from installing and using unauthorized boosters.

COAI has also appreciated WMO efforts in resolving interference issue arising due to Boosters.

4.2.10 Innovative approach for resolving interference arising due to Jammers:

Apart from unauthorized use of mobile signal boosters, there is another issue relating to the use of Mobile Jammers. Telecom Service providers across the country are facing interference issues due to Jammers installed in Jail premises. Since, these Jail authorities are authorized to use Jammers so its removal is not possible. In order to resolve such interference issues, WMO has been executing joint monitoring and inspection exercises comprising;

- i. Officers from WMO
- ii. Representatives of TSP's.
- iii. Technical representatives from company who has installed the Jammer
- iv. Jail authorities or as the case may be.

The motive behind these joint exercises is to find an amicable solution acceptable to TSP as well as Jail authorities. Such an approach is showing good results in resolving tedious interference cases.

4.2.11 Measuring of cellular signal Spillage from neighbouring countries:

Besides fulfilling the commercial needs of spectrum monitoring for public based telecom services, WMO also caters the requirements pertaining to monitoring of spillage of signals from other

neighbouring countries within the Indian Territory. Such spillage of signals, not only cause interference to existing public telecom services in border areas but also raises security related issues for the country.

From time to time, WMO provides inputs to the Ministry by conducting spectrum monitoring assignments along the border areas in coordination with security agencies.

4.2.12 Spectrum monitoring to ascertain the actual utilization of cellular spectrum by TSPs:

WMO is also engaged in monitoring of cellular spectrum allocated to TSPs with a view to ascertain its actual utilization by TSPs in various telecom circles. WMO is conducting such monitoring exercises through its 27 field units across the country. From time to time, WMO has been submitting consolidated report of cellular spectrum monitoring carried out through all its field units across the country. This monitoring was carried out in order to find out the utilization of RF spectrum allocated to TSP's and also identify the IMT operations against all the active frequencies in six bands viz. 800/900/1800/2100/2300 and 2500 MHz having 2G, 3G and 4G Technology.

4.2.13 High Priority Spectrum Monitoring Assignments:

The quantitative analysis pertaining to spectrum monitoring carried out with in WMO with effect from 01.04.2022 to 31.10.2022 is tabulated given below:

S. No.	Particulars	Actual performance during the period from 01.04.2022 to 31.10.2022	Anticipated performance during the period from 01.11.2022 to 31.03.2023
1.	Monitoring assignment handled	507	362
2.	No. of Wireless Transmission monitored	54494	38924
3.	Technical Assistance to users to maintain their operations within specified standards	276	197
4.	Infringements communicated to wireless users for remedial actions	484	346
5.	Channel hours utilized for Radio Monitoring	73235.5	52311
6.	No. of Wireless Stations Inspected	20923	14945
7.	No. of Radio Noise Measurements	99578	71127
8.	No. of High priority / Standard interference complaints resolved	505	361
9.	No. of assignment related to national security	2	2

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

4.2.14 Satellite Monitoring Activities:

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 up 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.

i. Satellite Monitoring Facility of WMO

- a) 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 degree 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.
- b) WMO also the small satellite monitoring facility at WMS Trivandrum and IMS Delhi.

ii. Satellite Monitoring Activities Undertaken: The following are the significant activities, among the others, were undertaken:

- a) Detection of TV channels uplinked by Teleport Licensees:

International Satellite Monitoring Earth Station (ISMES), Jalna and WMS Trivandrum has carried out monitoring of Teleport Licensees. 14 numbers of TV channels were found to be NOT endorsed in the respective licenses of Teleport licensees. Accordingly, 09 number of Infringement Notices (INF) to the respective Teleport licensees have been issued for violation of 14 unauthorised TV Channels during the period April - October, 2022.

- b) Violation of authorised Technical parameters by Licensees of satellite-based services:

International Satellite Monitoring Earth Station (ISMES), Jalna has carried out monitoring of authorised technical parameters viz (i) type of Modulation; (ii) Forward Error Correction (FEC); and (iii) Different logo. Total 19 number of violations to authorised technical parameters and different logo have been detected. Accordingly, 09 number of Infringement Notices (INF) to the respective Teleport licensees for violation of authorised technical parameters have been issued during the period April-October, 2022.

iii. Annual Performance Output Statics of Satellite Monitoring by WMO:

S.No.	Particulars	Achievements (Apr'2022-Oct'2022)	Anticipated (Nov'2022-Mar'23)
(i)	No. of satellite Monitoring Assignment undertaken	117	85
(ii)	No. of satellite Monitoring assignment cleared	116	85
(iii)	No. of satellite monitored	50	35
(iv)	No. of satellite transponder/carrier monitored	609	430
(v)	No. of satellite carrier identified	381	270
(vi)	No. of high priority satellite interference cases reported & resolve including satellite based public service operators	—	05
(vii)	No. of Channel hours utilized for satellite monitoring work	917	645
(viii)	No. of satellite Inspection carried out related to satellite operations	—	05
(ix)	No. of Infringements issued	9	6

4.2.15 Training and Development Activities: -

Wireless Monitoring Training & Development Centre (WMTDC), New Delhi is nodal agency for conducting training courses for officials and staff of Indian Radio Regulatory Service. WMTDC is also implementing National Training Policy on Training to improve training both in qualitative and quantitative manner.

The nature of training courses conducted during April 2022- March 2023 covers wide spectrum of diverse areas consisting of Induction Training for IRRS Gr A Officers Batch 2018 & 2019 (Phase II), Induction Training of IRRS Gr A Officers Batch 2020, Training on Policy on Access Spectrum assignment and issues related therein, Training on Radio frequency monitoring and related aspects for DCPW personnel, Training on Vigilance Administration and related aspects to IRRS Gr A officers.

In a nut shell, WMTDC has conducted 5 training till date and in process of conducting others in this year (April 2022 – Mar 2023) in which till now 108 Trainees have been trained.

Apart from it, WMTDC has also arranged/handled Technical and other Visits for probationers/trainee officers to other departments/establishments such as Directorate of Coordination Police Delhi (DCPW) field office and HQ, C-DOT Delhi, Joint Communications and electronics staff (JCES), Nokia factory Chennai, Society for Applied Microwave Electronic Engineering and Research (SAMEER) Chennai, Chennai port trust , IIT Madras and CEWiT, All India Radio Chennai , ARI GMDSS institute Saket Delhi, Giant Meterwave Radio Telescope Pune, National Centre for Radio Astrophysics Pune, Airport Authority of India , TATA Sky Chattarpur campus Delhi, Visit to Parliament of India .

The detailed information pertaining to trainings & Technical visits conducted in year 2022-till now is as following:

Sl. No.	Name of Training Course	Duration & Month	No. of Trainees
1.	Induction Training program for IRRS GrA officers Batch -2018 & 2019 (Phase II)	07 Weeks 21/3/2022 to 06/05/2022	09
2.	Induction Training program for IRRS Gr A Officers Batch 2020	11 weeks 17.05.2022 to 29/07/2022	03
3.	Policy for Access Spectrum assignments and issues related therein for JTS level IRRS officers	10 weeks (2 sessions per week) June – August 2022	26
4.	Training on “Radio frequency monitoring and related aspects” for DCPW personnel	02 days 27.07.22 & 28.07.2022	42
5.	Training on Vigilance Administration and related aspects for IRRS Gr A officers (Batch-01)	03 days 09.11.2022 to 11.11.2022	28
	Total No of Officers Trained		108

4.3 TELECOMMUNICATION ENGINEERING CENTRE (TEC)

Telecommunication Engineering Centre (TEC) is an attached office and technical arm of DoT 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. Further, TEC 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, Telecommunication 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 has its Headquarters in New Delhi and a network of four Regional Offices at Delhi, Mumbai, Bengaluru and Kolkata.

4.3.1 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, APT, WRC, IETF, ETSI 3GPP, 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. Nodal agency for Complaint resolution against local content under PPP-MII (Public Procurement Preference to Make in India) policy of DoT
- xiii. Designated Testing and Certification Agency for Conditional Access System (CAS) and Subscriber Management System (SMS) used for Broadcasting and Cable TV services
- xiv. Providing technical advice/ inputs for implementation of Production Linked Incentive Scheme of DoT

- xv. 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
- xvi. 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, 6G Technogym & Quantum Computing, Radio-communication, Satellite communication, Future Networks, Telecom Security, Internet of Things (IoT), Information Technology, Transmission, Fixed Access, Broadcasting & Convergence, Standardization, MTCTE, Indigenous Manufacturing Promotion & TBT Enquiry Point etc. The performance of TEC in its principal activities are indicated below:

4.3.2 DEVELOPMENT OF STANDARDS

As a National Standards Body for telecom & related IT domain, TEC develops National Standards. The total number of TEC standards in force, as on 31st October 2022 is more than 1250 covering mobile, radio-communication, satellite communication, fixed networks, switching, transmission, telecom security, transmission, IoT, ICT and broadcasting systems/ interfaces/ services etc.

- 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.
- ii. Standard for Generic Requirements for a Product/ Equipment: The Standard for Generic Requirements for a Product/Equipment 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: Interfaces are defined at different layers for convenience of peer-to-peer communication - Layer 1 Physical (Cable, RJ-45, E1 etc.), Layer 2 Link (MAC, PPP etc.), Layer 3 Network (IP, Q. 931 etc.), Layer 4 Transport (TCP, UDP, etc.), Layer 5 Sessions (Call setup, teardown, syn, ack, duplex/ simplex operation etc.), Layer 6 Presentation (Encryption, ASCII, MPEG etc.), Layer 7 Application (SNMP, HTTP, FTP, WebSocket etc.)

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.

- iv. Standard for Service Requirements: The Standard for Service Requirements (SR) 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.
- v. Test Guide: The Test Guide (erstwhile Test Schedule and Test Procedure (TSTP)) is describes testing and measurements to be performed as per Standard of a Product/Equipment, Interface or Service.
- vi. 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.
- vii. 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 standardisation needs of the evolving technologies related to Convergence and Broadcasting, a dedicated division is functioning in TEC.
- viii. 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. TEC has adopted more than 600 standards of various standardization bodies such as oneM2M, 3GPP etc.
- ix. Important Standards developed during the year:
 - a) Test Guides of Conditional Access System (CAS) and Subscriber Management System (SMS)
 - b) National Plan for Distribution of Indian Standard Time to Licensed Service Providers (TEC 49189:2022)
 - c) Standard for Band-Pass Filter for C-Band Satellite Earth Receivers in the 3700-4200 MHz Guard Band (TEC 57030:2022)
 - d) Standard for Energy Consumption Rating and Energy passport standardisation (TEC No. 74046:2022)
 - e) Standard for Interface Requirements for Communication and Broadcast Networks for FSS/BSS + Addendum (TEC 42012:2022), to support land based mobility of VSAT
 - f) Standard for Converged Multi-Service Application Access Equipment (TEC 71120:2022)

- g) Standard for Millimeter Wave (E-Band) Microwave Equipment (TEC 36060:2022)
- h) Standard for Hybrid Microwave Radio Equipment (15, 18 and 23GHz) - TEC 36050:2022
- i) Standard for Packet Microwave Radio Equipment (15, 18 & 23GHz) - TEC 36090:2022
- j) Test guide for implementation of MNP regulation for new entrants [upto the Telecommunication Mobile Number Portability (7th Amendment) Regulations, 2018]
- k) Standard on Router for MPLS based Transport Network (TEC 48050:2022) was revised for inclusion of Non-Chassis based categories of Router.
- l) Standard for ADSS Optical Fibre Cable for laying along Power line alignments (TEC 85190:2022)
- m) Standard for Aerial Drop Optical Fibre Cable with Installation Accessories (for Last mile applications) (No. TEC 85200:2022)
- n) Standard for Aerial Drop Optical Fibre Cable for last mile applications (Short span) (No. TEC 85220:2022)

4.3.3 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: 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: The Lab has the capability of testing LTE Core Networks and IP Multimedia Subsystem (IMS) by simulating all the Network and surrounding elements. As present, the lab is being 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. TEC control Lab is being used by C-DoT since 29.12.2021 on round the clock basis.
 - 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: The Green Passport (GP) Lab has facility to carry out Energy Efficiency Testing of various equipment in accordance with the energy consumption rating standards prescribed by TEC.
- iii. Scheme for Designating Domestic Testing and Certification Bodies & Scheme for Recognising Foreign Testing and Certification Bodies

TEC has notified Scheme for Designating Domestic Testing and Certification Bodies for Conformity Assessment of Telecommunication Equipment and Scheme for Recognising Foreign Testing and Certification Bodies for Conformity Assessment of Telecommunication Equipment.

- iv. TEC designated Conformity Assessment Bodies (CABs): Till October 2022, a total of 60 labs have been designated by TEC as CABs so far. During 2022, four new labs have been designated by TEC as CABs. Further, the scope of designation of 12 CABs has been enhanced and 17 existing CABs designation Certificates have been renewed. Notably, TEC has designated two labs for testing of Optical Fibre (Single Mode) and Optical Fibre cable for the first time.

Summary of designated CABs for important test domains		
Sl. No.	Name of Standard/Scope	Designated CABs
1.	IT Safety Requirements-IEC 60950-1	42
2.	EMI/EMC Testing	31
3.	Environment Testing (QM-333)	23
4.	Safety Requirements for Secondary cells and batteries (IEC 62133-2)	13
5.	Wi-Fi interface testing	7
6.	SAR Testing	4
7.	GSM, WCDMA or HSPA, LTE or LTE-A Interface	4
8.	IoT (ZigBee, LPWAN SigFox, RFID, NFC) Interface	2
9.	IPv4 & IPv6 testing	2
10.	1G,10G,40G,100G Optical interface	3
11.	OTU-1,2,3,4 interface	1
12.	STM-1,4,16,64 Interface	2
13.	E1, E2,E3, E4 interface	2
14.	PON Interface	2
15.	Optical Fibre- Single Mode	2
16.	Optical Fibre Cable	1

- v. Accreditation of Labs for CAS & SMS: TEC has issued Expression of Interest (EOI) on 24.06.2022 for accreditation of Labs for testing of Conditional Access System (CAS) and Subscriber Management System (SMS) used for Broadcasting and Cable TV services. In furtherance, TEC has organised an Open House session on 04.08.2022 with Broadcasters, Test labs, Multiple System Operators (MSO), MIB, TRAI, BIS, related Government departments and other stakeholders for consultation on setting-up of Labs for testing of CAS and SMS and process for accreditation of Labs.

4.3.4 Certification

- i. Conformance Certification: TEC issues Type Approval Certificate (TAC), Interface Approval Certificate (IAC) and Technology Approval Certificates against relevant standards.
- ii. Type Approval: Type Approval 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: Interface Approval 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.
- 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: Technology Approval 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.

Status of Technology Approvals	
Completed	Technology Approval granted for XGS-PON Mini OLT developed by M/s. C-DoT
Ongoing	(i) eNodeB developed by M/s. C-DoT
	(ii) Evolved Packet Core (4G Core Network) developed by M/s. C-DoT
	(iii) Wi-Fi Access Point (DOA1200) (Outdoor AP) developed by M/s. C-DoT
	(iv) 100 G DWDM System (C-TERA 8000) developed by M/s. C-DoT
	(v) GPON 4-PON Port OLT system (Model Office OLT) developed by M/s. C-DoT
	(vi) GPON 4-PON Port OLT system (Model Office OLT-2) developed by M/s. C-DoT

Regulatory Certification: Mandatory Testing & Certification

- vi. 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 this policy of mandatory testing in accordance to TEC document on “Procedure for Mandatory Testing and Certification of Telecom Equipment (MTCTE)” – TEC 93009:2021
- vii. Essential Requirements: TEC has issued 65 ERs so far, covering about 175 equipment.

Important Essential Requirement (ER) issued during the year

- ER for 5G Core (TEC40182205). It covers 5G technology related 12 network functions viz. AMF, UPF, SMF, UDM, AuSF, NEF, BSF, CHF, NSSF, PCF, SMSF and UDR.
 - ER for Base Station for Cellular Network (No. TEC42722205) has been updated to include 5G Technology related parameters/ variants.
 - ER for PTP PMP Microwave Fixed Radio Systems (No. TEC56422211) revised.
 - ER for Equipment Operating in 2.4 GHz & 5 GHz Band (No. TEC59432203) revised.
 - ER for Transmission Terminal Equipment (ER No. TEC78832206) issued.
 - Essential Requirement (ER) for Hybrid Set-top Box (ER No. TEC30042208) issued.
 - ER for Router (TEC37682204) revised for addition of Cellular interfaces.
 - ER for LAN Switch (TEC37942207) revised.
- viii. 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/ 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.

ix. MTCTE status:

Status of MTCTE implementation					
Particulars	Phase I	Phase II	Phase III	Phase IV	Total
Notification date	04.07.2019	23.06.2021	22.09.2021	22.09.2021	
Mandatory date	01.10.2019	01.10.2020	01.07.2023	01.07.2023	
Notified Telecom products*	21	6	24	124	175
OEMs registered Indian OEM – 91, Foreign OEM – 135			226		
Certificates Issued	157	88	18	94	357

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

x. MTCTE Certificates issued: So far, approximately 357 MTCTE certificates have been issued under this framework.

Status of MTCTE certificates issued		
Phase	ER/ Product Name	Number of Models Certified
I	2- Wire Telephone Equipment	80
	Cordless Telephone	11
	G3 Fax Machine	2
	ISDN Customer Premises Equipment	8
	Private Automatic Branch Exchange	56
II	PON Family of Broadband Equipment	76
	Transmission Term. Equipment (SDH, Multiplex. Equip.)	12
III	Base Station for Cellular Network	1
	Equipment Operating in 2.4 GHz and 5 GHz Band	15
	IoT Gateway	2
IV	IP Security Equipment	5
	LAN Switch	63
	Optical Fiber Cable	4
	PTP PMP Microwave Fixed Radio Systems	3
	Router	13
	Radio Broadcast Receiver	6
	Total	357

- xi. MTCTE Appeals: The Section IV of the MTCTE Procedure (TEC 93009:2021) 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. A total of 14 cases of appeal have been received by the Appeals Committee so far. The Appeals Committee has disposed all the cases of appeals referred to it.

4.3.5 Reforms in MTCTE

Reforms in MTCTE

- Dashboard to check/ monitor status/ pendency.
- Rationalization of ERs based on necessity and test infra availability
- Risk based equipment categorization.
- Periodic review of products to move them from GCS to SCS.
- Certificate validity increased to 10 years from exiting years.
- Acceptance of test reports from reputed government institutes/ organisations such as IITs, IISc, C-DOT, CDAC etc.
- Harmonization of MTCTE and NSDTS process, so as to avoid duplicate submission.

4.3.6 New Initiatives

- i. Development of Standards for Quantum Computing Systems:
- a) Standard for Quantum Key Distribution (QKD) system (TEC No.91000:2022): Shri Ashwini Vaishnav, Hon'ble Minister for Railways, Communications, Electronics & Information Technology along with Smt. Meenakashi Lekhi, Hon'ble Minister of State for External Affairs released the TEC standard on QKD system and witnessed the demonstration of QKD system by C-DOT and QuNu labs. Secretary (Telecom), Chairman (DRDO), Member (Service) Digital Communication Commission and other dignitaries from the Government, Industry, Academia and Research organisations were also present during the demonstration.



Release of TEC standard document on QKD system by Shri Ashwini Vaishnaw, Hon'ble Minister for Communications, along with Smt. Meenakashi Lekhi, Hon'ble Minister of State for External Affairs

- b) Standard for Post Quantum Cryptography system (TEC 91010:2023): The standards for Post Quantum Cryptography system provide the specifications for a cryptographic mechanism to ensure secured communication against vulnerabilities posed with the advent of Quantum computing.
- ii. Report on “Rollout of Small Cells for 5G Networks by leveraging Street Furniture”: The Report facilitates standard approach for the proliferation of Dense Small Cell Infrastructure and help in the roll-out of 5G small cells on Street Furniture and related infrastructure in India so that the potential of 5G can be realized to a greater extent.



Release of Report on “Rollout of Small Cells for 5G Networks by leveraging Street Furniture” by Secretary (Telecom) on 28.03.2022

- iii. Template for utilization of DISCOM Infrastructure by Telecom Service Providers for deploying 5G small cells: TEC in consultation with CEA, COAI and DIPA-finalized a Template for utilization of DISCOM Infrastructure by Telecom Service Providers for deploying 5G small cells.
- iv. Report on “Design and Standards for Common Ducts and Posts Infrastructure”: This document covers requirements for laying down Common DUCT and Post Infrastructure along Highways and public pathways, and all other necessary safety and precautionary equipment like firefighting, toxic sensor, ventilation etc.
- v. Framework for Fairness Certification of Artificial Intelligence Systems: In achieving the objective of the Government of India of building public trust in AI/ ML Systems (#AIforAll), TEC is working on standardisation of the process of evaluating AI systems for fairness, facilitate independent assessment, and certification and rating of AI systems for fairness voluntarily. TEC has constituted a Working Group comprising domain experts from Industry, Academia, and Research organisations to draft the proposed Standard for fairness assessment and rating of AI Systems. The TEC Standard is likely to be released by March 2023.
- vi. MoU between TEC and M/s VVDN for Open RAN testing facility: In order to facilitate startups, innovators and MSMEs working in the field of Open RAN to get their product tested at the existing lab of M/s VVDN at Manesar (Gurugram), an MoU is signed between TEC and M/s VVDN on 10 May 2022. VVDN lab can test interoperability among Open RAN components (RU/DU/CU) from different vendors along with radio conformance, protocol and interface testing as per defined Open RAN Standards. The product offered for testing will be certified by TEC.

4.3.7 IT Initiatives & New Portals

- i. Development of Standard Coordination Portal: The portal aims to facilitate Indian contributions to various Global Standardization Organizations and to provide a platform to share the information and collaborate on the standards development activities. The Portal is an integrated platform for all the National Working Groups (NWGs) to coordinate within the NWG and with other NWGs. The portal is under beta testing, at present.
- ii. Dash Board for monitoring of MTCTE: A MTCTE Dashboard has been made operational w.e.f. 21-Oct-2022. It has features to monitor certificates issued and pending at various stages of certification on real time basis. The monitoring can be done product wise, applicant wise, Regional TEC wise etc. during a selected time period.
- iii. Portal for automation of Conformity Assessment Body (CAB) designation process: For making the CAB Designation process more efficient and transparent, TEC has introduced online acceptance of CAB Designation/Renewal through National Single Window System (NSWS) applications w. e. f. 26.05.2022.

4.3.8 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	<ul style="list-style-type: none"> PoC testing of Free Space Optical Communication of M/s Google-X at Bangalore, Meerut and Kohima completed.
Ongoing	<ul style="list-style-type: none"> Indigenous 4G Macro eNodeB of M/s. Lekha Wireless Indigenous 4G LTE eNodeB of M/s. Resonous Indigenous 4G LTE eNodeB of M/s. Signal Chip Indigenous E Band Microwave System of M/s. Astrome

4.3.9 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
 1. BSNL's indigenous 4G Proof of Concept (POC) evaluation
 2. TEC conducting/ anchoring Proof of Concept (PoC) testing/ evaluation for:
 - Indigenous 4G Macro eNodeB of M/s. Lekha Wireless
 - Indigenous 4G LTE eNodeB of M/s. Resonous
 - Indigenous 4G LTE eNodeB of M/s. SignalChip
 - Indigenous E Band Microwave System of M/s. Astrome
- b) Technology Approvals/ Certificate of Approval (CoA) to indigenous developed technologies/ products
 1. 5G Core Network developed by M/s Amantya is under Certificate of Approval by TEC.
 2. EPC (4G Core Network) developed by C-DoT is under Technology approval by TEC
 3. eNodeB (4G Radio Access Network) developed by C-DoT is under Technology approval by TEC
- 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
 - a) Knowledge sharing of standards/ regulations
 - b) Handholding for testing of design/ proto-types & certification
 - c) Enabling participation in standard development process
 - d) Enabling membership of ITU National Working Groups (NWGs) thereby participation in international standardization activities

- iii. Enabling promotion/ deployment of Emerging Technologies

5G:

- a) Essential Requirements (ERs) for Base Stations and Core network elements issued.
- b) Standards for Generic Requirements for gNodeB (5G Base Station) and 5G Core (5GC) Network are under formulation.
- c) Report on Rollout of Small Cells for 5G Networks by leveraging Street Furniture: This report facilitates standard approach for proliferation of denser small cell infrastructure in the country for hassle-free rollout of 5G services and Envisages the use of street furniture like street lights for deployment of 5G base stations.

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:

- a) Engaging with academic/ R&D institutions, startups and industries to familiarize with the research and development works and to synergise the efforts of various stakeholders for pre-standardisation activities.
- b) Workshop on 6G technologies with participation from academia, R&D institutions, startups, industries and service providers.
- c) 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.
- d) Co-ordination, interaction and policy inputs to various organisations on the (i) Spectrum, standardisation, validation (ii) Indigenisation and development of 6G ecosystem (iii) Use case development, deployment studies.

IOT:

- a) Policy inputs viz. 13-digit numbering scheme, Embedded SIM & remote subscription management
- b) Technical Reports on IOT/M2M technology – Architecture, Communication technologies, Spectrum, Numbering resources etc.

- c) Technical Reports on IOT/M2M Security - embedded SIM, Code of Practice for securing consumer IOT, National Trust Center
- d) Technical Reports on use cases of IOT/M2M – Smart Cities (Strategies, Design & Planning aspects & Standards), Intelligent Transport System, Smart Agriculture, Smart Village, Power, Remote Health, Safety & Surveillance etc.

4.3.10 Engagement with International Standardization Activities

- i. International Telecommunication Union (ITU)

The Study Groups of ITU's Telecommunication Standardization Sector (ITU-T) develop international standards known as ITU-T Recommendations which facilitates deployment and harmonious growth of the global infrastructure for information and communication technologies. The ITU-T has eleven Study Groups. With the thrust of the Government to enhance India's participation, leadership and influence in international standardization arena, India has secured 8 leadership positions (including representatives from industry and academia) in 11 Study Groups at the meeting of ITU World Telecommunication Standardization Assembly (WTSA)-20 took place at Geneva, Switzerland, during 1st to 9th March 2022.

- ii. 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. These NWGs are National Committees, normally constituted for four years' period and are conterminous with ITU-T's Study Group (SG). NWGs comprises members from Industry, Academia, R&D Organizations, Scientific Bodies, Subject Experts, Service Providers, manufacturers and related Government departments/ ministries/ organizations (such as DoS, MoI&B, MoD, MHA, MoRTH, MeitY, CSIR, NPL, BIS etc.), in addition to the members from TEC & DOT units. Regular meetings of NWGs are convened in TEC and all draft technical papers called 'Contributions', are discussed, edited and ratified in these NWGs, before submission to ITU. The objective of the NWGs is to contribute to ITU standardization keeping in view the national requirements, interest and priorities.

Description of various ITU Study Groups (SG), their corresponding National Working Groups (NWGs) in India and NWGs contributions in the ITU meetings are summarized below:

- iii. ITU-T Study Group 2 - Operational aspects of service provision and telecommunications management

SG2 is responsible for the maintenance of ITU's International Numbering Resource (INR) database and for standards on the management of telecom services, networks and equipment. India is holding the position of Vice-Chair in ITU-T Study Group-2. NWG2 (corresponding to ITU-T SG2) was reconstituted for new study period 2022-24, comprising of 42 members. NWG-2 had three meeting so far in the current year.

- iv. ITU-T Study Group 3 - Tariff and accounting principles including related telecommunication economic and policy issues

ITU-T SG-3 is responsible, *inter alia*, for studying international telecommunication/ ICT policy and economic issues and tariff and accounting matters (including costing principles and methodologies). SG-3 is also tasked with the study of the economic and regulatory impact of the Internet, convergence (services or infrastructure) and new services, such as OTT, on international telecommunication services and networks. India is holding the position of Vice-Chair in ITU-T Study Group-3. DDG (C&B) TEC attended the SG-3 meeting at Geneva from 23-27 May 2022 as part of Indian delegation and presented a contribution on Technical Report on Roaming Aspects of IoT and M2M. Indian delegate was appointed as the SG-3 Liaison officer to ITU-T SG-9 and as Editor of draft Recommendation D.IoT/M2M Roaming.

- v. ITU-T Study Group 5 - EMF, Environment, Climate Action, Sustainable

ITU-T Study Group 5 (SG5) is responsible for studies on methodologies for evaluating ICT effects on climate change and publishing guidelines for using ICTs in an eco-friendly way. Further, ITU-T Study Group 5 (SG5) is the lead study group on electromagnetic fields (EMF), environment, climate action, sustainable digitalization, and the circular economy.

National Working Group-5 (NWG-5) corresponding to the ITU- T Study Group (SG)-5 reconstituted in June 2022 for the Study Period 2022-24. Presently, NWG-5 has more than 55 members and held 4 meetings as preparatory meetings for ITU-T SG 5 meetings.

- vi. ITU-T Study Group 9 - “Audio visual content transmission and integrated broadband cable networks” or “Broadband Cable and TV”

ITU-T Study Group 9 (SG9) carries out studies on the use of telecommunication systems in the distribution of television and sound programs supporting advanced capabilities such as ultra-high definition and 3D TV. India is holding the position of Vice-Chair in the ITU-T Study Group-9.

National Working Group-9 (NWG-9) corresponding to the ITU- T Study Group 9, reconstituted in May 2022 for the Study Period 2022-24. NWG-9 has more than 30 members and held 5 meetings since May 2022.

- vii. ITU T Study Group 11: Signalling requirements, protocols, test specifications and combating counterfeit telecommunication/ ICT devices

ITU-T Study Group 11 is responsible *inter alia* for studies related to signalling-system architecture, signalling requirements and protocols, for all types of networks such as future networks (FN), cloud-computing networks, VoLTE/ViLTE-based network interconnection, virtual networks, multimedia, next-generation networks (NGN), software-defined networking (SDN) technologies, network function virtualization

(NFV) technologies, IMT-2020 networks and beyond etc. Study Group 11 is also responsible for studies to combat counterfeit telecommunication/ICT devices & mobile device theft besides work on conformance and interoperability (C&I) programme. India is holding the position of Chair of the ITU-T Study Group-11. National Working Group (NWG) -11 corresponding to the ITU- T Study Group 11 was reconstituted in April 2022 for the Study Period 2022-24. NWG-11 has 30 members. NWG-11 and held 3 meetings since April 2022.

- viii. ITU-T Study Group 12: Performance, quality of service (QoS) and quality of experience (QoE)

ITU T Study Group 12 is responsible for Recommendations on performance, quality of service (QoS) and quality of experience (QoE) for the full range of terminals, networks, services and applications, ranging from speech over fixed circuit-based networks to multimedia applications over networks that are mobile and packet based. National Working Group (NWG) -12 corresponding to the ITU-T Study Group 12 reconstituted in April 2022 for the Study Period 2022-24. NWG-12 has 85 members and held 4 meetings since April 2022.

- ix. ITU T Study Group 13: Future networks and emerging network technologies (& cloud)

ITU-T Study Group 13 is responsible for studies relating to the requirements, architectures, capabilities and application programming interfaces (APIs) as well as softwarization and orchestration aspects of converged future networks (FN) including the application of machine learning technologies. India is holding the position of Vice-Chair in the ITU-T Study Group-13. National Working Group-13 (NWG-13) corresponding to the ITU- T Study Group 13 reconstituted in April 2022 for the Study Period 2022-24. NWG-13 has 62 members and held 3 meetings since April 2022.

- x. ITU-T Study Group 15: Networks, technologies and infrastructures for transport, access and home

The ITU-T SG15 includes the development of standards for the optical transport network, access network and home network infrastructures, systems, equipment, optical fibres and cables and the related installation, maintenance, management, test, instrumentation and measurement techniques, and control plane technologies to enable the evolution toward intelligent transport networks. India is holding the position of Vice-Chair in the ITU-T Study Group-15. National Working Group-15 (NWG-15) corresponding to the ITU- T Study Group 15 reconstituted in April 2022 for the Study Period 2022-24. NWG-15 has 49 members and held 3 meetings since April 2022.

- xi. ITU T Study Group 16: “Multimedia and related Digital Technologies”

Responsible for studies relating to ubiquitous multimedia applications, multimedia capabilities, multimedia services and multimedia applications for existing and future networks. India is holding the position of Vice-Chair in the ITU-T Study Group-16.

The National Working Group-16 corresponding to ITU-T Study Group-16 is constituted, comprising of 75 members. NWG-16 has conducted two meetings and working upon various questions of Study Group for development of contributions to the forthcoming meetings of SG-16.

xii. ITU T Study Group 17: Security

ITU T Study Group 17 is responsible for building confidence and security in the use of information and communication technologies (ICTs). This includes studies relating to cybersecurity, managed security services, endpoint detection and response, security management, countering spam and identity management. India is holding the position of Vice-Chair in the ITU-T Study Group-17.

National Working Group-17 (NWG-17) corresponding to the ITU- T Study Group 17 reconstituted in April 2022 for the Study Period 2022-24. NWG-17 has 51 members and held 3 meetings since April 2022.

xiii. ITU T Study Group 20: Internet of Things (IoT) and Smart Cities and Communities

Study Group 20 is responsible for studies relating to Internet of Things (IoT), its applications, and Smart Cities and Communities (SC&C). This includes studies relating to big data aspects of IoT and SC&C, digital services for SC&C, and digital transformation relevant to IoT and SC&C aspects.

National Working Group-20 (NWG-20) corresponding to the ITU- T Study Group 20 reconstituted in April 2022 for the Study Period 2022-24. NWG-20 has 78 members and held 5 meetings since April 2022.

xiv. 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.

National Study Group-5 (NSG-5) corresponding to the ITU- R Study Group 5 (SG5: 'Terrestrial Services' was constituted for the Study Period 2019-2023. Presently, NSG-5 has more than 70 members. NSG-5 held multiple meetings for preparation towards ITU-R WP5D meetings.

xv. Participation in other International Standardization Bodies:

TEC also participates in standardization activities of 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.

4.3.11 Important Activities During the Year

- i. Participation in India Mobile Congress (IMC):
India Mobile Congress (IMC), 2022, was held from 1st October 2022 to 4th October, 2022 at Pragati Maidan, New Delhi. TEC stall was inaugurated by Shri Ashwini Vaishnav, Hon'ble Minister for Railways, Communications, Electronics & Information Technology on 1st October 2022.
- ii. Activities of National Enquiry Point for WTO –TBT (Technical Barrier to Trade) Agreement:
TEC is designated as National Enquiry Point for WTO TBT Agreement for Telecom Sector. In this regard, queries of WTO member countries received in respect of notification issued by TEC were examined and suitably responded. TEC is also part of Core Committee constituted by Department of Commerce for analysis of TBT and SPS notifications issued by other countries.
- iii. Implementation of Public Procurement, Preference to Make in India (PPP-MII) policy of DoT: As per PPP MII order issued by DoT the telecom Products, notified by DoT under PPP MII Policy, needs to comply with the latest TEC GR/IR, if such GR/IR has been issued. TEC is the nodal agency for prescribing telecom standards and applicable certification for telecom products. TEC is also the nodal agency to handle the complaints in respect of local content declared by bidders under PPP MII Policy for telecom sector through the complaint committee mentioned in the Notification. The TEC PPP MII portal also supports online filing of complaints against self-certification in respect of Local Content submitted by the bidders to procuring authorities including the monitoring of status of complaint. The portal is integrated with Non-Tax Recipe Portal (NTRP) of Govt. of India for online deposit of the prescribed fee. The portal has made the entire process of complaint filing and monitoring online. TEC has received two such complaints in the current financial year. Also, one complaint received in November 2021 was disposed during the period.
- iv. Technical Report on 'IoT/ ICT standards for Smart Cities' (TEC 31178:2022) It was released by Secretary (Telecom). Technical report covers study of cross-sectoral requirements of Smart Cities related to telecom & ICT sector in various verticals like Energy, Transport, Water management, Waste management, City surveillance, Health, Smart homes/ buildings etc. This technical report is intended for use by Smart Cities Mission (MoHUA), Smart Cities SPVs, Smart City consultants, Telecom Service Providers (TSPs), M2M Service Providers, and other related stakeholders.
- v. Technical Report on "Framework of National Trust Centre for M2M/IoT Devices and Applications" and "TEC Initiatives in M2M/ IoT Domain- An overview"
The report on "Framework of National Trust Centre for M2M/ IoT Devices and Applications" proposes National Trust Centre as a repository that manages the lifecycle of trusted M2M/ IoT devices which provide a sense of trust to the users. The report on "TEC Initiatives in M2M/ IoT Domain- An overview" summarizes various

technical reports released by TEC in M2M/ IoT domain and their outcomes.

- vi. Examination of Special Chemicals, Organisms, Materials, Equipment and Technologies (SCOMET) cases: There are certain products identified under Special Chemicals, Organisms, Materials, Equipment and Technologies (SCOMET) category, export of which is regulated by Government. Export of these items are controlled by DGFT. The Category 8 of SCOMET items contains items related to Telecommunications Sector. TEC is one of the nodal government agencies for providing technical input to government on export of SCOMET items related to Telecom Sector and comments on 6 SCOMET applications have been provided.
- vii. Technical Examination of CMRTS/ PMRTS license cases: TEC examines and offers comments on CMRTS/ PMRTS license applications forwarded by DoT for ascertaining their technical compliance to relevant TEC standards/ regulations.
- viii. Issues related to HS Codes for Telecom Products: The HS Codes for telecom products are reviewed by DoT HQ for creation/ grouping of telecom products under specific HS Codes. Technical inputs are being provided in respect of issues related to creation / review of HS Codes for telecom products.
- ix. TEC provided 7 days training in online mode to 25 number of women of Rural background on EMI/EMC testing.
- x. TEC engaged Interns in accordance to 'TEC Internship Scheme' and Research Associates (RAs) in accordance to 'TEC Research Associates Scheme'.
- xi. The Recertification Audit (External) of TEC New Delhi, for ISO 9001:2015 certification was held and Certificate of Registration was renewed.

4.3.12 Knowledge Sharing Events/Activities

- i. Webinar on Cyber Security for M2M/IoT
- ii. Session held with IIT Mandi on "Mitigating Spectrum Shortage in India using Cognitive Radio Enabled Mobile Devices and Hybrid Dynamic-Spectrum-Access Model" on 20.06.2022.
- iii. Webinar on "Policy and Regulatory framework on Conformity Assessment for Telecom products: Global Best Practices and Priorities"
- iv. Webinar on "Development of 5G Testing Capabilities in Country" for all designated Laboratories of TEC on 09.09.2022.
- v. Study paper on Digital Rights Management System (DRMS) was released on 26.09.2022. It highlights the need of security mechanisms to protect the content from unauthorized access with the advent of new IP-based methods for delivering content to the end-user.
- vi. TEC organized a Webinar on Framework for Fairness Certification of Artificial Intelligence Systems.

4.3.13 Important Ongoing Activities (likely to be completed by March 2023)

- i. Development of Standards/ ERs for:
 - a) Standard for 5G gNode-B, 5G Core and 5G NIB
 - b) Standard for Quantum Technology equipment: Encryptor (Post Quantum Cryptography), QRNG and Quantum Computing platforms-hardware subsystems, control software & quantum software
 - c) Standards for IOT products/ systems, Smart Cities.
 - d) Standard for Metal free/ unarmoured Optical Fibre Cable with Double HDPE Sheath for underground laying
 - e) ER for E-Band Microwave system
- ii. Revision of Standard/ ERs for:
 - a) eNode-B to include 3GPP Release 15, Release 16 features (TEC 21050:2019)
 - b) Evolved Packet Core (EPC) to include 3GPP Release 15, Release 16 features (TEC 22150:2019)
 - c) Test Procedure for Measurement of Electromagnetic field from Base Station Antenna to include 5G deployment scenario
 - d) EMF Measuring Instrument
 - e) 'CMSAAE' to incorporate 4G/5G interface and technical requirement due to new convergence showcased (TEC 71120:2022)
 - f) Multi-Service Optical Transport Network (OTN) platform with DWDM bearer transport system for Metro and Core Network Applications (TEC 86090:2017)
 - g) Optical Spectrum Analyzer (TEC 88080:2007).
 - h) Optical Fibre Splicing Machine (TEC 88090:2012 and 88100:2012)
 - i) Explore the revision of Standard for PABX in view of the requirement of Server based IP-PABX with Media Gateway (TEC 60030:2016)
 - j) Standards for Firewall, Intrusion Detection System and Structured LAN Cabling
 - k) ERs for Router, LAN Switch, Infiniband Switch, IP Security Equipment, PTP GM, Hypervisor, IP Multimedia Conferencing Equipment, Server)
- iii. Technical Report on:
 - a) Framework for Security by design principle for M2M device manufacturing.
 - b) IoT and 5G applications in Smart Grid.
 - c) Emerging Technologies and standards for Intelligent Transport Systems.
 - d) IoT and 5G use cases in Agriculture.

- iv. TEC is in the process of formulating Test Guide (TSTP) for testing of Rollout obligation for 5G technology.
- v. Report on Policy for mobile country codes (MCC) and mobile network codes (MNC) Allocation for 5G CNPN (Captive Non Public Networks) is under preparation.

4.3.14 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. The performance of RTECs w.r.t. important activities are as under:

- i. Type Approval Certification:

Type Approval Certificate issued during the year

- Type Approval for Wi-Fi Access Point, (Model - Ion4) of M/s. HFCL Limited, Solan against TEC 38020:2021 by Northern Region, Delhi.
- Type Approval for IP PABX with Media Gateway (Model - Mivoice MX-One) of M/s. MVD Technologies Private Limited, Delhi against TEC 60030:2016 by Northern Region, Delhi.
- Type Approval for IP PABX with Media Gateway (Model - SV9500) of "NEC Corporation India Private Limited, New Delhi against TEC 60030 by Northern Region, Delhi.
- Type Approval for IP PABX with Media Gateway (Model - NEOS INFINITY) of M/s Arvind Limited (Telecom Division), Pune against TEC 60030:2016 by Western Region, Mumbai.
- Type Approval (Renewal) for STM-1 Synchronous Multiplexer (Model TJ1400 – STM1) of M/s. Tejas Networks Ltd., Bengaluru against TEC 86020:2011 by Southern Region, Bengaluru.
- Type Approval (Renewal) for STM-4 Synchronous Multiplexer (TM/ADM), Model-TJ1400 (STM-4) of Tejas Networks Ltd., Bengaluru against TEC 86020:2011 by Southern Region, Bengaluru.
- Type Approval for MPLS-TP based Carrier Ethernet Switch for Aggregation and Access Network Applications, TJ1400 of M/s. Tejas Networks Ltd., Bengaluru against TEC 48130:2017.
- Type Approval for IP PABX with Media Gateway (Model - ast E1000) of M/s. astTECS Communications Pvt. Ltd., Bangalore against TEC 60030:2016 by Southern Region, Bengaluru.

ii. Interface Approval Certification:

Interface Approval Certificate issued during the year	
	<ul style="list-style-type: none"> Interface Approval for High Speed Line Driver (Model - Teamlink 3002 G.SHDSL) of M/s. Team Engineers Advance Technologies India Pvt Ltd, Hyderabad against TEC 48052:2017 by Southern Region, Bengaluru. Interface Approval (Renewal) for Interchange of Digital Signals at 2, 8, 34,45 & 140 Mb/s ports STM-4 TM/ADM, TJ 1400 of M/s. Tejas Networks Ltd Bengaluru against TEC 89102:2012 by Southern Region, Bengaluru. Interface Approval (Renewal) for Interchange of Digital Signals at 2, 8, 34,45 & 140 Mb/s ports STM-1 TM/ADM, TJ 1400 of M/s. Tejas Networks Ltd, Bengaluru against TEC 89102:2012 by Southern Region, Bengaluru.

iii. Certificate of Approval:

Ongoing	<ul style="list-style-type: none"> 5G SA Core Network for enterprises (Model - AMT_5GC) of M/s Amantya Technologies Pvt. Ltd, Gurgaon, Haryana at NR Delhi. Infinxt SDWAN (Model - iEdge-1K) of M/s Infinity Labs Limited, Gautam Buddha Nagar, Noida at NR Delhi. KOTKAR - HexaTower-40M, 55m/s (Model No. FBFT-HT4055 - 3LTCH) of M/s Kotkar Energy Dynamics Pvt. Ltd. Pune at WR Mumbai. KOTKAR - HexaTower-40M, 47m/s (Model No. FBFT-HT4047 - 3LTCH) of M/s Kotkar Energy Dynamics Pvt. Ltd. Pune at WR Mumbai.
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- iv. Proof of Concept (PoC) Testing: Testing for Free Space Optical Communication (FSOC) system of M/s Google-X completed at Bangalore, Meerut & Kohima and report submitted. Further testing is in progress for (i) Indigenous 4G Macro eNodeB of M/s. Lekha Wireless (ii) Indigenous 4G LTE eNodeB of M/s. Resonous (iii) Indigenous 4G LTE eNodeB of M/s. SignalChip, and (iv) Indigenous E Band Microwave System of M/s. Astrome.

4.4 DIRECTOR GENERAL TELECOM (DGT)

4.4.1 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 36 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. 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, operationalisation and monitoring of different projects/ schemes approved by DoT e.g Telecom Analysis and Fraud Management and Consumer Protection (TAFCON), Project for graphical visualisation 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:

4.4.2 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 83.28 lakhs of CAFs from 01.04.2022 till 30.09.2022 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 96,658 BTSs from 01.04.2022 till 30.09.2022 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 01.04.2022 till 31.10.2022, a total of 63 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 roll-out 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 of 223 Towns/DHQs for period from 01.04.2022 to 30.09.2022 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 drive tests in 43 number of cities to monitor QoS for period from 01.04.2022 to 30.09.2022 across all TSPs.

4.4.3 Technology Vertical

i. PM-WANI (PM Wi-Fi Access Network Interface)

PM-WANI is a prestigious project to accelerate the proliferation of broadband across the length and breadth of the country through Public Wi-Fi networks which is a step towards Digital India and takes forward the goal of National Digital Communications Policy - 2018 (NDCP) of creating a robust digital communication infrastructure in the country. As per the framework and guidelines for registration issued by DoT HQ, LSAs are registering the PDOAs (Public Data Office Aggregators) and App providers.

ii. Delegation of signing of ISP licence agreement

In July 2020, DoT has delegated the signing of Unified Licence Agreement (UL) and Unified Licence (Virtual Network Operators) (UL VNO) of ISP Authorization of Category "A", "B" and "C" at field offices of DOT i.e. at LSA office of respective

Telecom Service Area. 535 UL and 406 UL(VNO) ISP Licenses have been signed by LSAs since decentralization.

iii. Inspections of TSPs/ Subscribers

LSAs are, inter-alia carrying out inspections of UASL/CMTS/Basic/UL/NLD/ILD/ISPs/ OSPs/IP-1s/VSAT etc. licensees, for checking compliance to terms and conditions of their license/ registrations. 557 retailers/Distributors and 5 Warehouse inspections carried out during period from 01.04.2022 till 30.09.2022. Inspection of 206 ISP licensees, 19 NLD, 11 ILD have been done during period from 01.04.2022 till 30.09.2022.

iv. Implementation of Short Codes/ Helplines

LSAs coordinate with TSPs and concerned authorities to which the Short Code has been allocated by Licensing Wing for its implementation.

v. Testing of 5G Trial networks by DGT LSA field units of DoT

LSAs have engaged with DCT (Digital Communications Technology) stakeholders viz. Start-ups/SMEs, CoEs, Incubation centres, State govt. departments etc. and have extended necessary facilitation for Technology ecosystem such as 5G, IoT / M2M etc. DoT-HQ had issued 5G Technology Trials licenses to Telecom Service Providers (TSPs) for testing purpose. The LSA field units of DoT during 5G technology trials networks had carried out the following functions:

- a) Facilitating TSPs for operationalizing 5G Trials to enable successful demonstration of Indian specific 5G Use Cases in co-ordination with State Government Departments/Local authorities.
- b) Co-ordinating with TSPs for Integrating indigenously developed products/ applications including 5G Hackathon solutions in trials networks
- c) Testing and verifying the performance parameters of trials network & 5G use cases, as per Test Schedule and Test Procedure finalized by TEC in collaboration with representatives from DoT-HQ MeitY, DST, NSCS, IB/MHA, WMO/WPC, State Government Departments, domain experts from the user/ sectoral ministries depending upon the use case deployment and evaluation parameters.

vi. Surveillance implementation in LSA field units as per Mandatory Testing and Certification of Telecom Equipment (MTCTE) Rules:

Indian Telegraph (Amendment) Rules, 2017 notified in Gazette of India inserted Rule 528 to 537 under G.S.R. 1131(E), amended vide gazette notification dated 5 th September 2017 (PART XI: TESTING AND CERTIFICATION OF TELEGRAPH) prescribes for mandatory testing and certification of any telegraph which is used for capable or being used with any telegraph established, maintained or worked shall

have to undergo prior mandatory testing and certification. The MTCTE Procedure notified for implementation of these rules provides that the Telegraph Authority/ Appropriate Authority (AA) reserves the right to inspect and/or test any telegraph, which requires mandatory certification at any time and at any premises including sites where it is in use or at the place of manufacturing to ensure that the telegraph used/sold has required certifications and/or conforms to the Essential Requirements of existing certifications. In this regard, Heads of LSA Field units of DoT are designated as Telegraph/ Appropriate authority for surveillance implementation and follow up in the field. The surveillance is to be carried out to monitor and enforce the compliance of MTCTE as required under Indian Telegraph Rules. The concerned telecom service providers/licensees of DoT have also been sensitized through respective LSA field units to enforce compliance to the MTCTE.

vii. Disaster Management

DDG(T) in LSAs are the designated nodal officer for disaster Management. LSA field unit coordinate with State Government and TSP for early restoration of Telecom Services in the state during disaster. STDCC meetings are being conducted regularly.

4.4.4 Security Vertical: -

i. Lawful Interception and National Security

- a) Centralized Monitoring System (CMS) has been implemented with the approval of Cabinet Committee on Security (CCS) with Government funding of ₹ 400 crore. The system facilitates Ministry of Home Affairs, Central Law Enforcement Agencies (LEAs) and State Police for automated Law-full interception and monitoring process. It also allows seamless delivery of interception related information even when the target is in roaming or ported to another operator. All the TSPs' Networks & most of the LEAs are connected through 21 Regional Monitoring Centres (RMCs) on MPLS network.

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.

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. Currently 144 Nos. of IMS nodes are operational across 18 Licensed Service Area (LSA) field units of DoT as on 30-9-2022.

LSA field units are carrying out 24x7 Operations in close co-ordination with

Law Enforcement Agencies (LEAs) and Corrective and preventive Maintenance of IMS Network.

- c) The LSAs are also acting as technical interface between Security Agencies and Telecom Service Providers and assist in matters related to National Security.
- d) LSAs also act on various communications received from LEAs and Security Wing of DoT regarding spillage of mobile signals from neighboring countries into Indian Territory.
- e) LSAs conduct monthly coordination meetings with various stakeholders for closer interaction and to resolve the issues.

ii. GREY market/Clandestine Operations

LSAs carry out investigation to curb illegal operations (not permitted under Indian Telegraph Act), which pose threat to National Security, in coordination with Law Enforcement Agencies (LEAs). LSAs also take action for unearthing the illegal telecom setups based on the information received from DoT call centre (1800110420/1963), Jaipur and the subsequent analysis of CDRs, IMEIs and recce of suspected premises with the help of local police, before busting the frauds.

LSAs have unearthed 192 numbers of illegal set ups w. e. f. January, 2014 till September, 2022.

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.

LSAs have done 55 Security Audits during the period of 01-04-2022 to 30-09-2022.

iv. Citizen centric approach to reduce the cybercrimes

The citizens, when they receive a fraudulent call suspected to be a cybercrime, report the said number either to the local police authorities, call on helpline number 1930 or report online on National Cyber Crime Reporting Portal (URL - <https://cybercrime.gov.in/>). The LSA field units under the control of DGT Telecom actively analyse the suspected numbers and take necessary action after connection re-verification viz-a-viz disconnection of telecom resources, monitoring of filing of complaint/FIR with police against Point of Sale (POS) by TSPs etc..

v. URL Blocking

Government of India issues instructions to ban web sites, URLs and APPs which pose threat to the national security. The LSA field units had successfully assessed

the effectiveness of blocking of the said APPs / URLs / Websites. The feedback along with the deficiencies have been highlighted for corrective steps. Also, a centralized client-server based application for managing workflow of URL blocking/un-blocking has been developed by NTIPRIT. The application provides customized interface for workflow management by all stakeholders viz. DoT HQ, Meity, LSAs, ISPs besides a dashboard for senior officers. Salient feature of the application includes master data of ISP profile, report generation, search facility, alter generation, date/time stamping and digital signature for ensuring integrity of correspondence.

vi. Workshop on Security related matters at Lucknow and Bangalore for LSAs/LEAs

Two days' workshops on Security related matters were organized one each at Lucknow on 22nd - 23rd August 2022 by UP (E) LSA for East and North Zone LSAs/LEAs and at Bangalore on 15th - 16th September 2022 by Karnataka LSA for West and South Zone LSAs/LEAs.

Officers from DOT, Law Enforcement Agencies (LEAs) of Central and State/UTs, MHA and representatives from telecom industries (TSP/COAI/ISPAI) participated in the workshop.

This workshop was aimed on enhancing coordination among DOT and LEAs and on boarding of all the State/Central LEAs on the Central Monitoring System (CMS)/ Internet Monitoring System (IMS) Platforms to explore the ways and means to improve upon the existing systems for more effective utilization by the security agencies. It also aimed at keeping Licensor (DOT), Licensees (TSPs/ISPs) and LEAs abreast of the latest technological developments.

The main topics for deliberations included CMS, IMS, Grey Market, TAF COP, ASTR, DIU, CEIR, TSOC/TCSIRT, NCRP/I4C, advancement in Mobile phone forensics, key strategies for providing security in cyber, Grey Market Case Studies etc. A session on sharing of experiences & expectations by LEAs, LSAs, COAI, ISPAI and TSPs etc. was also conducted. Eminent speakers from the NTIPRIT, C-DoT, MHA, State & Central LEAs, DOT LSAs, Academia from IISc & DSCI, COAI, ISPAI and TSPs etc. covered the above topics and various security related matters being dealt by LSAs and LEAs.

Exclusive sessions on detection and prevention of Cybercrimes and Frauds, Illegal telecom setups which cause financial loss and is a grave concern for the national security were also conducted. For crime detection and prevention using the telecom resources, various advance data analysis tools developed by DOT LSAs using AI, ML etc. were introduced, the way forward and the road map for the deployment of DIU was shared with the participants.

vii. Mission Utkarsh

Mission Utkarsh is PM's new initiative for upliftment of Selected Districts for providing mobile coverage in 10 identified Districts. The KPI for DOT is to cover uncovered villages in these identified districts.

S. N.	State / UT	District
1	A&N	North & Middle Andaman
2	Andhra Pradesh	East Godawari
3	Arunachal Pradesh	West Kameng
4	Chhattisgarh	Sukma
5	Himachal Pradesh	Chamba
6	Ladakh	Kargil
7	Madhya Pradesh	Barwani
8	Maharashtra	Gadchiroli
9	Odisha	Malkangiri
10	Rajasthan	Jaisalmer

The 3287 uncovered villages as on 31.03.2022 have been taken as base figures of the DoT KPI. Out of 3287 villages, 1486 villages will be covered in existing / ongoing USOF scheme and remaining 1801 villages are included in “4G Saturation coverage” scheme of USOF.

- viii. Mission Mode Programme - Providing 4G mobile coverage in 75 identified village one each in 75 blocks in NE region

This programme is of Ministry of Development of North East Region (DoNER). Various activities have been identified to be undertaken in this mission Mode Programme for decent living of villagers. Provisioning of Mobile/Net connectivity/digital infrastructure pertains to DoT. DoNER has identified 75 villages one each in 75 blocks in NE region. Out of 75 villages, 34 villages are already 4G covered and remaining 4G uncovered villages are included “Saturation 4G Coverage” scheme of USOF and targeted to be 4G covered by March, 2024.

- ix. Vibrant Village Programme (VVP)

Vibrant Village Programme (VVP) is a very ambitious programme of Government of India for development of border area. In this programme, officers from various ministries visit the border village to know the ground realities of various projects being implemented, bottlenecks being faced in rollout / improvement and carry out on the ground assessment of socio-economic conditions of the people living in border villages to give practical prescriptions for comprehensive development and bringing these villages in mainstream.

221 villages have been visited by officers of LSA field units from May, 2022 to September, 2022.

x. Shri Amarnathji Yatra - 2022

Shri Amarnathji Yatra-2022 commenced from 30th June, 2022 and continued till 11th August, 2022. J & K LSA, DoT with the help of TSPs got 38 new towers installed on war footing for augmenting the mobile coverage on ShriAmarnathjiYatra route (Both Baltal and Chandanwadi routes). The entire work was completed before the commencement of ShriAmarnathji Yatra-2022 with the cooperation from TSPs and State authorities.

xi. Joint survey along International Border

A joint survey along International Border has been conducted jointly by LSAs, WMO, TSP, and LEAs to identify spillage of mobile signals from foreign Telecom Service Providers (TSPs) and mobile coverage by Indian TSPs in border villages/habitations/ Border Out Posts (BoPs). The survey was conducted during Feb-Oct, 2022 and was spread over 18 States/UTs (11 LSAs) covering the international border of Pakistan, China, Nepal, Bhutan, Bangladesh and Myanmar. Based on the outcome of the survey following action have been initiated.

- a. Presence of usable foreign spill signal reported to MEA and MHA for taking the matter bilaterally with neighboring countries.
- b. Areas with poor/no coverage taken up with TSP/USOF for optimisation of existing network and installation of new towers.

xii. Projects undertaken

- a) Project “Telecom Analytics for Fraud management and Consumer Protection”- TAF COP: TAF COP helps in identifying individual customers with more than nine active mobile connections and also helps in identifying the active mobile connections which are potentially suspected to be involved in Cybercrimes. This portal has been developed indigenously by Andhra Pradesh LSA.

Through this portal, customers can know about the active mobile connections using his/her Proof of Address / Identity. Further, Central and State Law Enforcement Agencies (LEAs) have been given access to check the customers’ details of mobile numbers.

This portal aims at reducing frauds using telecom resources, which directly protects the interests of consumers.

This system is operational on PAN India Basis and all the 22 Licensed Service Area (LSA) field units of DoT are using it. The portal has been opened to consumers in Andhra Pradesh, Jammu and Kashmir, Kerala, Meghalaya, Mizoram, Rajasthan, Telangana and Tripura States/UTs. In rest of the States/UTs, access to consumer portal is planned in a phased manner. The Portal can be accessed through URL <https://tafcop.dgtelecom.gov.in/>.

- b). AI and Facial Recognition powered Solution for Telecom SIM Subscriber Verification (ASTR - अस्त्र) Project

ASTR-8 अस्त्र Project is a Next-Gen indigenous and innovative solution for detecting and weeding out fraudulent SIM subscribers, who have obtained mobile multiple connections using fake/forged documents, across all TSPs, by utilizing Artificial Intelligence, Facial Recognition and Big Data Analytics. ASTR utilizes the crop images provided by the Telecom Service Providers (TSPs) as per DoT instructions dated 09-08-2012. It compares cropped images and groups similar images together using AI based facial recognition with very high grade of accuracy. After further comparison with details available in subscriber database, ASTR verifies whether same person has acquired SIMs in different Names/Guardian-Name/DoB or any other KYC parameter.

ASTR-8 अस्त्र has a very crucial role in curbing the cybercrimes including financial frauds. ASTR utilises AI based Facial Recognition systems. This has been developed inhouse by Haryana LSA.

Over 18.7 crore subscribers' data pertaining to J&K LSA and hotspot areas of 8 LSAs (Bihar, Delhi, Haryana, Kolkata, North East, Odisha, Rajasthan and West Bengal) identified by MHA have been analysed. The results of ASTR analysis have been very encouraging and 14 Lakh of non-compliant mobile connections have already been disconnected and actions have been initiated by the Law Enforcement Agencies (LEAs) against the culprits.

- c). Central Equipment Identity Register(CEIR)

CEIR project has been implemented with the aim to curtail the counterfeit mobile phone market and discourage mobile phone theft, protect consumer interest and facilitate law enforcement authorities for lawful interception. CEIR acts as a central system for all Telecom Network Operators to share black listed mobile devices so that devices blacklisted in one network will not work on other networks even if the Subscriber Identity Module (SIM) card in the device is changed.

It Includes "Stolen Device Reporting System" – to black list the stolen devices pan India. The Stolen Device Reporting can be done by citizens and State Police or Law Enforcement Agencies as well. The systems Track Stolen Device (if used in Indian mobile network) for further investigation by State Police or Law Enforcement Agencies. It also Provides Device Verification facility to Government departments, Lawful Agencies/ State Police and Citizens through SMS, Web portal and KYM (Know Your Mobile) Mobile App.

This system helps Telecom Subscribers in Mobile device verification, Handset genuineness checking before purchase, avoiding misuse of stolen/lost mobile by blocking PAN India, Improved traceability of the stolen/ lost handset.

Using this system, Telecom Service Providers will be able to provide Improved Quality of Service & reliability, Network Capacity and Network Health.

It is equally helpful to Government in Reducing duplication of IMEI, Traceability of miscreants, blocking/interception of IMEIs, reduction of Tax evasion etc.

This system is operational on PAN India Basis. The CEIR portal has been opened to Citizens and State Police or Law Enforcement Agencies in Arunachal Pradesh, Delhi, Goa, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland and Tripura States/ UTs. The CEIR Portal can be accessed through URL <https://www.ceir.gov.in/Home/index.jsp>

4.4.5 Rural Vertical

i. Identification of mobile uncovered villages

DGT office regularly compiles the list of mobile uncovered villages in close co-ordination with TSPs and State/UT authorities. The list is shared with Policy wing, DOT and USOF. Based on the list a “Saturation 4G Coverage” has been started by USOF for providing 4G coverage in all mobile uncovered villages.

ii. USOF/DoT funded projects

Currently many USOF projects including “Saturation 4G Coverage” are ongoing for installation of over 27,000 towers for providing mobile coverage in uncovered villages and along highways. These projects mainly cover LWE areas, aspirational districts, international borders, North Eastern regions, A&N islands etc. LSAs are actively involved in survey, facilitating the permissions, monitoring the implementation of sites and their operations.

1st Aspirational site on- air in Odisha LSA on 6th November 2022. Village: Rangamuguda, PO: Kumbhari, PS: Narayanpayna, Dist: Koraput, Odisha

iii. DBT (Direct Beneficiary Transfer)

Telecom infrastructure, being an underlying part of DBT infrastructure, is very crucial to achieve the missions of DBT. DoT



is on the mission to provide robust mobile and fibre connectivity to all the villages of India. This will also enable the Financial/ banking institutions to open their branches/ATMs especially in rural areas. In order to achieve the goals, DDG(Rural) in each LSA office, located at state capitals, has been nominated as the state level coordination officer from DoT for coordinating with state level banking committees (SLBCs) to resolve any network issues faced by financial



institutions in providing DBT service. In this regard, LSAs are attending the SLBC meetings and coordinate with the TSPs for the resolution of the network/connectivity issues in implementation of the DBT mission.

In addition, DoT office is coordinating and cooperating with DBT mission to ensure connectivity to unbanked villages across India.

4.4.6. Admin Vertical

i) Handling of VIP references

DG Telecom office provides resolution of the issues raised by VIPs (Central/ State Ministers, MPs, MLAs, CMs etc.) in respect of Telecom services in the country. During the period of 01.04.2022 to 30.09.2022, 63 numbers of VIP references were disposed of.

Important Events



Hon'ble Minister of State for Communications' outreach program in Gadit tribal village, Narmada district, Gujarat

4.4.7 National Broadband Mission

The National Broadband Mission was launched by the Government of India on the 17th December, 2019 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.

- i. Progress and development in the Mission activities: The progress of the implementation of the Mission so far is as under:
 - a) A Governing Council for Broadband was formed under the Chairmanship of Hon'ble Minister of Communications to oversee the mission. First meeting of the Committee

was held on 24.11.2020. Second meeting of the Governing Council was held on 09.11.2022, Hon'ble MOC requested Central Ministries and State/ UT Governments to explore as to how they may connect village institutions in service ready 1.81 lakh GPs under BharatNet Project. He also requested MoHUA to push states to support street furniture design for small cells based on TEC standards, and requested them to incorporate the addendum to Model Building Bye-Laws, 2016 in the States bye laws by March 2023.

- b) A Broadband Steering Committee has been formed under the Chairmanship of Secretary (Telecom) to facilitate implementation of mission activities. The Committee was reconstituted on 10.12.2021, to include members from States/ UTs, Central Ministries and also from industry. Meeting of the committee was held on 06.06.2022.
- c) Under the Mission, the States are to constitute their State Broadband Committees, with Chief Secretary of the State in Chair, for effective implementation of the mission and proliferation of broadband in the States. All 36 States/Union Territories have formed their State Broadband Committee. These committees have started functioning and addressing the issues related to the Mission.
- d) Progress under NBM since 2019-
 - 1 No of broadband subscribers increased from 66cr to 81cr
 - 2 Per capita monthly data consumption increased from 10GB to 15GB
 - 3 44,500 villages provided mobile broadband connectivity
 - 4 1.84 lakh villages connected by Bharatnet
 - 5 13.49 lakh km OFC laid
 - 6 1.47 lakh towers installed; 1.60 lakh BTSs fiberized
 - 7 Andaman & Nicobar Islands provided broadband through undersea cable
- e) Annual implementation plan and present Status of the NBM targets -

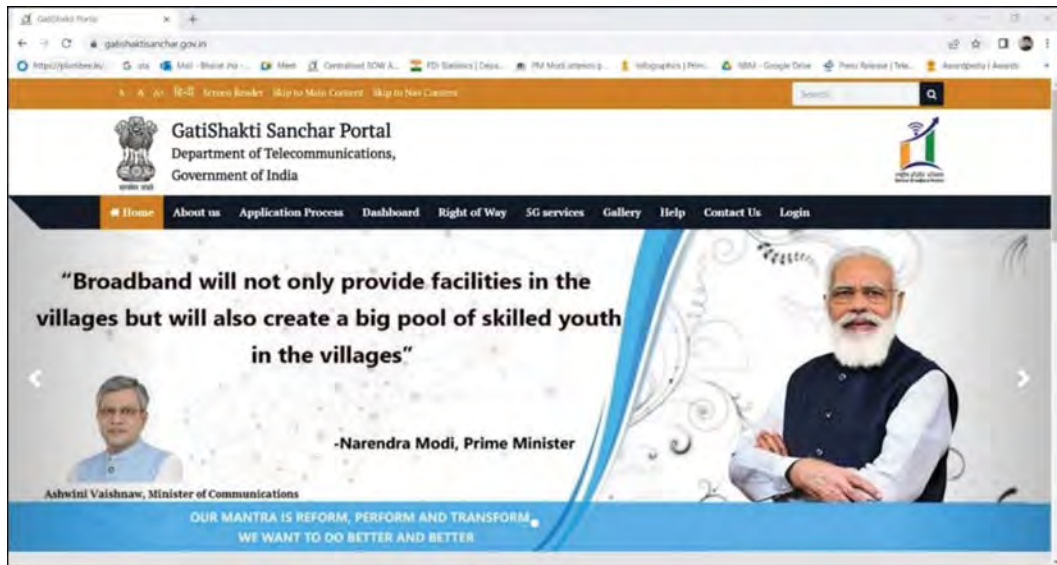
KPI	1-year (2020-21)	2-year (2021-22)	3-year (2022-23)	Status as on 30.09.2022	4-year (2023-24)	5-year (2024-25)
Broadband Connectivity to Villages (%)	50%	60%	100%	93.21%	-	-
Availability of broadband Speeds (Mbps)	4	10	25	*Mobile BB- 13.87 Mbps *Fixed BB- 48.59 Mbps	30	50
Fiberization (Lakh KMs) Cumulative	24	27	30	35.50 Lakh	40	50

Towers (in lakhs) Cumulative	7	8	10	7.33 Lakh	12	15
Fiberization of Telecom Towers (%) Cumulative	35	45	55	35.98%	65	70
Mapping of Fiber Cumulative	10%	40%	60%	76% (Govt. PSUs)	80%	100%

* Source - India's Mobile and Broadband Internet Speeds - Speedtest Global Index

ii. Actions taken –

- a. Centralised GatiShakti Sanchar Portal created to transparently process the Right of Way applications and monitor the pendencies in real time.



GatiShakti Sanchar Portal



GatiShakti Sanchar portal Dashboard

1. Portal Launched on 14th May 2022 by Hon'ble Minister of Communications. All 36 States/UTs and the Ministry of Railways (MoR), Ministry of Road Transport and Highway (MoRTH) are integrated with it. This portal also enables application submission for the Ministry of Defence(MoD) - Director General Military Operations (DGMO) and MoD- Director General Defence Estates (DGDE) - Defence Estate Offices (DEO). Development of the portal for MoD-DGDE (CANTT.) is under development and testing. With this portal the average processing time of the RoW applications has come down from about 200 days to just about 12 days and the over RoW pendency could be brought down from 71,000+ in Dec. 2021 to about 19,000 in May 2022.



Launch of GatiShakti Sanchar Portal by Hon'ble Minister of Communications

2. The 5G application form has also been launched on 25/08/2022 by Hon'ble Minister of Communications to facilitate TSPs/ISPs/IPs in 5G planning through use of PM GatiShakti NMP platform wherein the GIS mapping of street Furnitures/Utilities in has been done.
 - b. Alignment with Central Right of Way (RoW) Rules, 2016
 - i. 35 States/UTs notified their RoW policies in alignment with Central Right of Way (RoW) Rules 2016.
 - ii. After the release of amendment to RoW rules, all States/UTs have been requested to notify State RoW Rules in alignment with Central Rules.
 - c. Right of Way approvals of Central Ministries are monitored through Project Monitoring Group (PMG) portal
 - d. Regular review of RoW Issues by DoT and review by Hon'ble PM under PRAGATI on 25th May 2022 – Offline RoW applications pendencies have reduced from ~70,000 to ~18,000

from December 2021 to July 2022. Now RoW pendencies are monitored through Gati Shakti Sanchar Portal. Average disposal time for the month of August 2022 is 13.87 days per application. Monthly review with Secretaries of States/UTs being done under Chairmanship of Secretary Telecom/Additional Secretary Telecom/DGT

- e. 5G Spectrum auction completed, out of 72,098 MHz spectrum put to auction, 51,236 MHz (71% of the total) has been sold.
- f. RoW Rules for 5G:
 - 1 Amendment in the Indian Telegraph Right of Way (RoW) Rules, 2016 to facilitate faster and easier deployment of Telecom Infrastructure was released on 25.08.2022. The amendment makes the charges for RoW permissions reasonable and a ceiling for RoW charges for installation of 5G small cells and optical fibre cable on street furniture has been fixed.



Release of RoW Rules Amendment by Hon'ble Minister of Communications

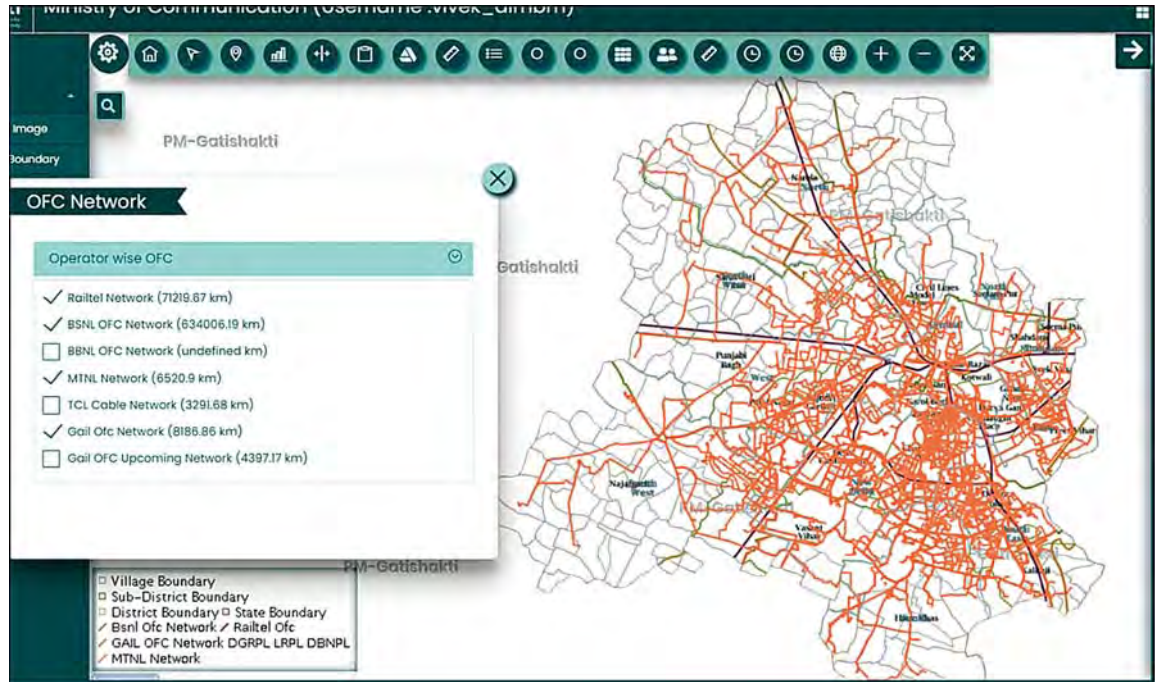
- 2 The States/UTs are being followed up to adopt the Addendum to Modern Building Bye-Laws 2016 issued by Ministry of Housing and Urban development
- 3 A new 5G RoW application 'form' was launched on GatiShakti Sanchar Portal to enable faster 5G roll-out, by Hon'ble MOC.
- 4 4 Zonal Online workshop (North, East, West, South) on '5G Rollout—Role of Street Infrastructure and small cells' organised for all 36 states/UTs to prepare DISCOMs/Regulators to handle policy and RoW issues related to street furniture/ poles for the 5G small cell rollout.

g. Launch of 5G services and rollout plan in India:

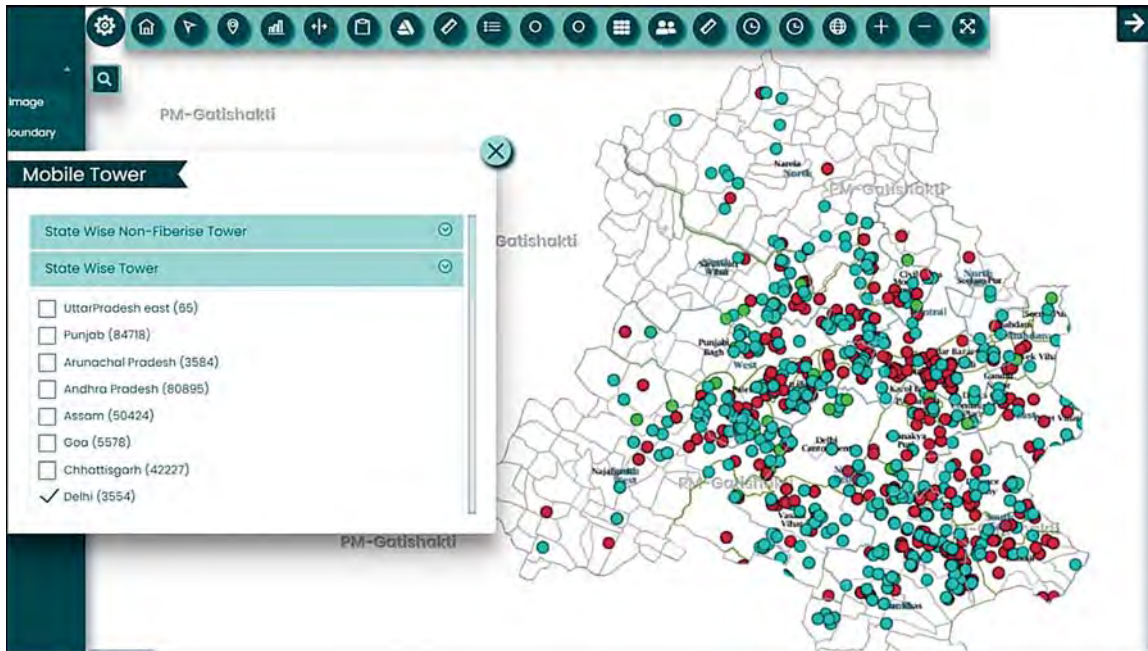
- 1 Hon'ble PM launched 5G services in India on 1st-Oct-2022 during 6th edition of India Mobile Congress event. Capacity building conferences are planned in States/UTs to create awareness amongst officials of States/UTs about various use cases of 5G. Already such conferences have been organized in the states of Delhi, Andhra Pradesh, Manipur, West Bengal, Haryana and Chandigarh.
- 2 14 States/UTs have formed a working Committee under SBC to facilitate faster 5G rollout.

h. Mapping of Telecom Infrastructure on PM GatiShakti National Master Plan (NMP) Portal –

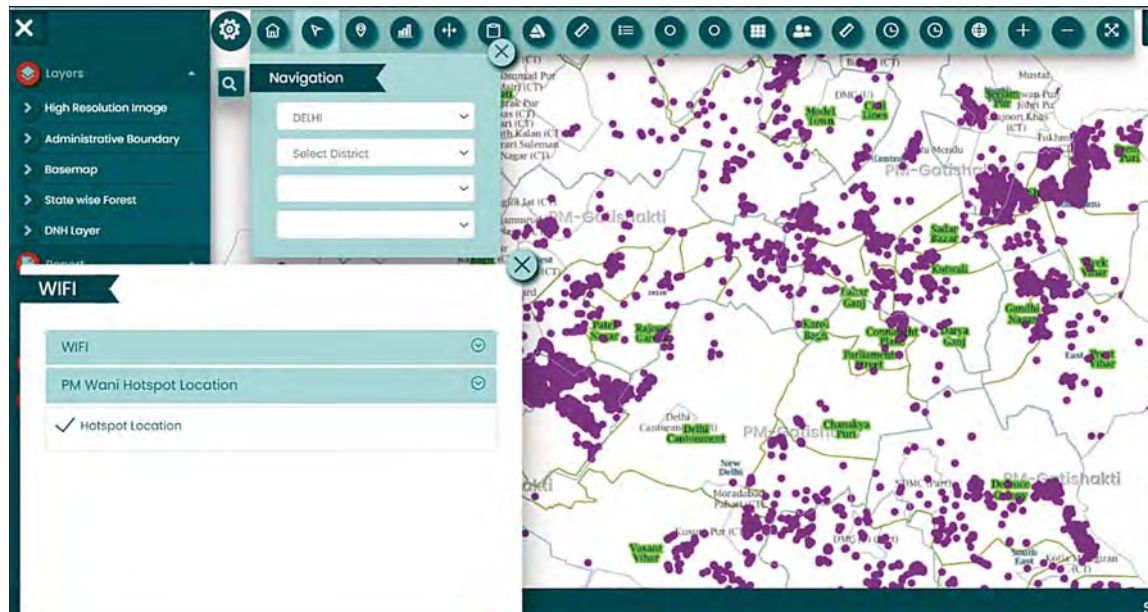
- 1 Around 10 Lakh Route Km of OFC, (out of 13 lakh Rkm laid by PSUs, around 7.3 Lakh Telecom towers and 23 lakh BTSs installed by all TSPs and 1 lakh WiFi hotspots are mapped on NMP.



Mapping of OFC on PM GAtiShakti NMP Platform



Mapping of Towers/ BTSs on PM GatiShakti NMP Platform



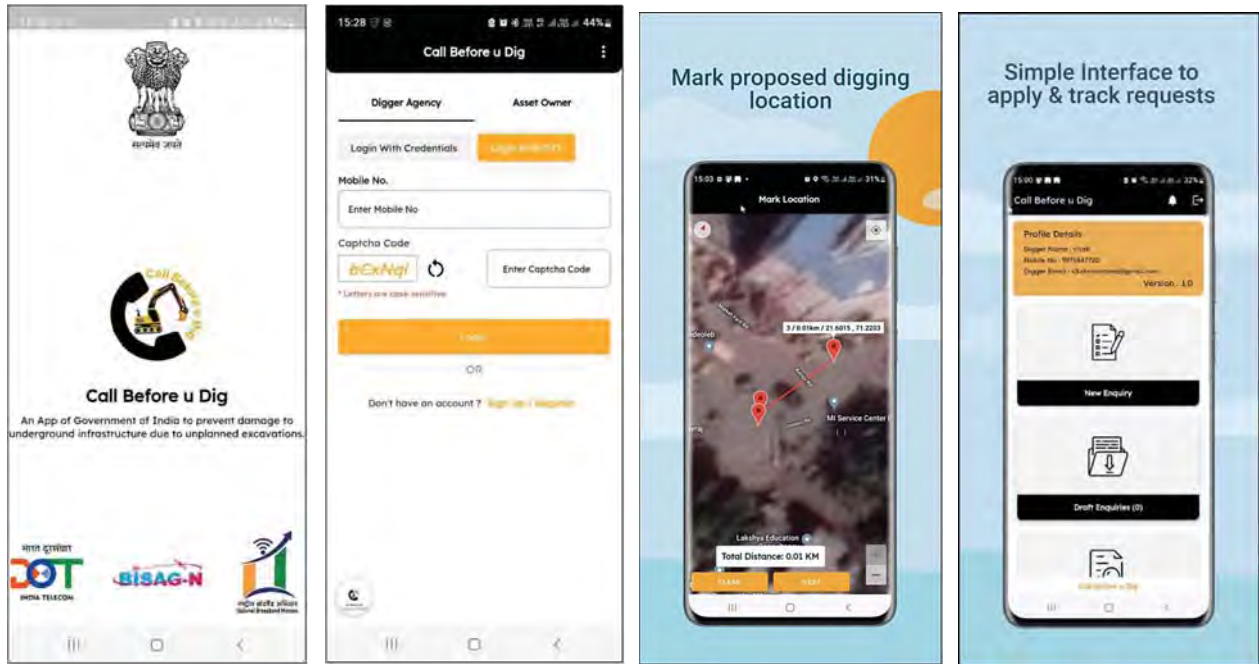
Mapping of WiFi Hotspots on PM GatiShakti NMP Platform

- 2 OFC of state governments is progressively being mapped. OFC of Telangana State Govt. is already mapped.
- 3 Training of DoT LSAs and Telecom Service Providers (TSPs), Infrastructure Providers (IPs) has started at NTIPRIT and a total of 850 participants have been trained with following objectives:
 - For increasing fiberization of towers from current 35.98% to 70% by 2025 - quarter wise fiberization targets have been given to Telecom Service Providers for FY 2022-23.

- To connect the public institutions like Primary Health Centres (PHCs), Schools, Economic Zones etc. with OFC from the nearest available Fibres from PSU.
- For 5G planning through mapping of state governments buildings and street infrastructure.
- For planning and execution of 4G saturation project.

i. “Call Before u Dig” Mobile App:

To facilitate smooth coordination between digging agencies and underground utility asset owners to save existing underground utilities from damages during the digging activity, ‘Call Before U Dig’ Mobile App has been developed. It will not only save Optical Fibre Cables, but will also help save other utilities like Water Pipelines, Electric Cables, Gas Pipelines etc. from damages during digging.



The pilot is operational in the State of Gujarat & UT of Dadra and Nagar Haveli since 6/10/2022 and will be progressively extended to all other States/UTs from 1st December onwards.

4.5 UNIVERSAL SERVICE OBLIGATION FUND (USOF)

4.5.1 Organizational Structure and Functions and Objectives of USOF:

i. Organizational Structure

The Universal Service Obligation Fund, formed by an Amendment Act of Parliament, is headed by the Administrator USO Fund, appointed by the Central Government, for the administration of the Fund. It is an attached office of the DoT.

ii. Amendment to Telegraph Act for creation/ administration of USO Fund:

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, thereby creating Universal Service Obligation Fund (USOF). The USO Fund was established with the fundamental objective of providing access to 'Basic' telegraph services to people in the rural and remote areas at affordable and reasonable prices. Subsequently, the Indian Telegraph (Amendment) Act, 2006 was notified on 29.12.2006 to repeal the term "basic" wherein the scope of USO Fund was widened to provide access to telegraph services (including mobile services, broadband connectivity and creation of infrastructure like OFC) in rural and remote areas.

4.5.2 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 31.10.2022, 6,00,898 km Optical Fibre Cable has been laid and 1,77,665 GPs are Service Ready on OFC. In addition, 4466 GPs have been connected over satellite media. Total GPs service ready are 1,82,131. Wi-Fi hotspots have been installed at 1,04,664 GPs and 1,01,257 FTTH connection are installed by BSNL, CSC-SPV & others ISPs. Overall data usage on BharatNet is about 1,921 Tera Bytes for the month of October, 2022.

The Operation, First Line Maintenance (FLM) and utilisation of BharatNet (except State led model Phase-II) has been handed over to BSNL with effect from 01.04.2022 w.e.f. 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 over 2000 franchisees have been made. A pilot scheme has been approved by USOF for providing 1 lakh FTTH connections by BSNL using BharatNet in six months' time on revenue sharing basis through BharatNet Udyamis, in the rural areas. Interactions have been held by BBNL with the User Ministries/Departments interacted to seek the demand for high speed data connections for the institutions running in rural areas.

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. Revised RFP and timelines are being worked out

with alternative models. As indicated in the Budget announcement for 2022-23, the project is envisaged to be completed in 2025.

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

a) Mobile Services in Uncovered villages in rest of NER and seamless coverage along National Highway:

Under this scheme, Mobile connectivity was planned to be provided by setting up 2128 towers in the uncovered villages and along National Highways of Assam, Manipur, Mizoram, Nagaland, Tripura, Sikkim, and Arunachal Pradesh (National Highways only) of North-East region. The Agreements were signed on 08.12.2017 and total 1,358 sites have been installed and are providing services covering 1246 villages and 283 National Highway sites.. The installation work is almost complete for feasible sites.

b) 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. Till October-2022, Survey work of all 1683 villages of Arunachal Pradesh and 653 villages out of 691 villages in two Districts of Assam have been completed. In Arunachal Pradesh 14 sites have been installed and commissioned covering 19 villages and in two Districts of Assam, 54 sites have been installed and commissioned covering 67 villages. Target for completion of this project is April, 2023

iii. Project for Hiring of 10 Gbps International Bandwidth for Internet Connectivity to Agartala from BSCCL, Bangladesh via Cox Bazar

For making available high quality and high speed internet access to the States of North Eastern Region of the country, USOF has signed an agreement with BSNL on 18.08.2021 for hiring of 2x10 Gbps International Bandwidth for Internet Connectivity to Agartala from Bangladesh Submarine Cable Company Limited (BSCCL), Bangladesh via Cox Bazar/ Kuakata. The first 10 Gbps link was commissioned on 26.11.2021 and the second 10 Gbps link was commissioned on 21.04.2022. The project was completed with a cost of Rs. 17.15Cr. to USOF.

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

1. Submarine OFC Connectivity between Chennai and Andaman & Nicobar Islands:

Cabinet in its meeting held on 21.09.2016 approved the dedicated submarine OFC link from Chennai to Port Blair & 5 other Islands viz. Car Nicobar, Little Andaman, Havelock (Swaraj Dweep), Kamorta and Great Nicobar Island. Subsequently, submarine OFC connectivity of Rangat Island and Long Island was approved in addition to 6 Islands. 2313 km four pair Submarine Optical Fibre Cable has been laid, out of which one fibre pair has been shared with Ministry of Defence exclusively. Hon'ble Prime Minister inaugurated and dedicated to nation the Chennai-Andaman Nicobar Islands (CANI) Project on 10.08.2020 at a cost of Rs. 1,224 Crore. All segments of CANI submarine cable project are commissioned. 200 Gbps Bandwidth is available between Chennai to Port Blair while 100 Gbps bandwidth is available within Islands. The Tripartite Agreement for Operation & Maintenance has also been signed between USOF, BSNL & U.T. Administration of Andaman & Nicobar Islands on 13.11.2020. The present bandwidth utilization is 90 Gbps.

2. Satellite Bandwidth Augmentation for Andaman & Nicobar Islands:

Work of augmentation of satellite bandwidth from 2 Gbps to 4 Gbps in Andaman & Nicobar Islands was awarded to BSNL on nomination basis. The CAPEX of Rs. 36.39 Crore plus applicable taxes is being funded by USO Fund, while OPEX (Satellite Transponder charges) is being funded by MHA / UT Administration of Andaman & Nicobar Islands. Work of augmentation of satellite bandwidth from 2 Gbps to 4 Gbps has been successfully implemented by BSNL on 09.09.2021 despite second phase of COVID-19.

3. 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 USOF through VGF Model [Total: Rs 129.58 Crore (excluding taxes)]. Agreement was signed between USOF and M/s RJIL on 15.03.2021 as an outcome of the open tender floated by USOF for implementation of project in 12 months. Till October-2022, 105 tower sites [Village: 58, Highway: 47] have been approved by USOF as against 124 tower sites survey reports submitted by M/s RJIL. Site acquisition under process in coordination with UT ANI & LSA. Satellite Bandwidth to RJIL for the project has been allocated by ISRO.

b) Lakshadweep Islands:

1 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 NECCIPL as an outcome of global tender floated by them. The project is targeted to be implemented by May 2023 i.e., within 1000 days from the date of announcement by Hon'ble Prime Minister on 15th August 2020.

2 Satellite Bandwidth Augmentation for Lakshadweep Islands:

Work of augmentation of satellite bandwidth from 318 Mbps to 1.71 Gbps in Lakshadweep Islands was awarded to BSNL on nomination basis. The CAPEX of Rs. 28.26 Crore plus applicable taxes is being funded by USO Fund while OPEX (Satellite Transponder charges) is being funded by MHA / UT Administration of Lakshadweep Islands. Work of augmentation of satellite bandwidth from 318 Mbps to 1.71 Gbps has been successfully implemented by BSNL on 14.08.2021. Further, enhancement of satellite bandwidth from 1.71 Gbps to 3.46 Gbps has been dropped due to the request from UT Administration/MHA.

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 Digital Satellite Phone Terminals (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:

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 affected areas in the first phase. Tender 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 at a cost of Rs.337 crores and is under implementation. Further, additional order to cover 55 villages of Uttarakhand, J&K, Rajasthan and Gujarat has been given under the scheme. As on 31.10.2022, 294 villages have been covered with 4G mobile services by installing 273 mobile towers.

- 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 Cr. 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 will be executed by BSNL using Atmanirbhar Bharat's 4G technology stack and will be funded through Universal Service Obligation Fund.
- viii. Aspirational Districts Scheme
- a. 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. Till October-2022, 132 villages have been covered by installing 106 Mobile towers under this project.
 - b. 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) at an estimated cost of Rs. 6,466 Crore has been approved by Government on 17.11.2021. The RFP was floated on 07.12.2021 and the agreement with L-1 bidders (M/s RJIL for 3 States and M/s BAL for two States) have been signed on 20-05-2022. Survey of sites is under progress. Till October-2022, 6185 villages survey has been completed and 3 mobile sites have been commissioned in Chhattisgarh.

4.5.3 Status of USO Fund:

As on 31-12-2022 Universal Access Levy (UAL) amounting to Rs.1,34,076.96 crore has been collected and the total allotment amounting to Rs.64,590.89 crore received through Parliamentary approvals has been utilized to fulfill the objective of USOF. The balance of UAL amount available as potential fund under USOF is Rs. 64,486.07 crore as on 31.12.2022.

Details of subsidy disbursed under Universal Service Obligation Fund during the FY 2022-23:

Amount proposed to be Disbursed during 2022-23 (Rs. in Crore)	The expenditure till December, 2022 (Rs. in Crore)
3010	2067.41

4.6 NATIONAL CENTRE FOR COMMUNICATION SECURITY (NCCS)

4.6.1 National Centre for Communication Security is a subordinate office under DoT with headquarters at Bengaluru, for the purpose of establishing and operationalizing a framework of telecom security testing and certification within the country. In order to make the network more secure and less vulnerable from internal and external threats, Government envisaged a pilot Telecommunication Testing and Security Certification (TTSC) project for testing and validating each

network element before its integration with the telecom network. The Security Assurance Standards Facility (SASF) of DoT at Bengaluru is an outcome of this pilot project and is a national facility for framing the Security Assurance Requirements for Telecom equipment to be inducted into the Indian telecom networks. The TTSC has been renamed as NCCS in 2019 and entrusted with the responsibility to establish and operationalize a framework of telecom security testing and certification within the country. It is equipped with test beds for conducting testing and development of telecom testing procedures in compliance with the Indian Telecom Security Assurance Requirement (ITSAR) for the telecom equipment. NCCS is equipped with four test beds for preparing, developing and validating the test procedure for conformance to the ITSAR.

4.6.2 NCCS security related activities in brief:

- i. Development of country specific Security assurance standards called Indian Telecom Security Assurance Requirements (ITSAR) for every Telecom equipment
- ii. Designation of third-party Telecom Security Test Laboratories (TSTL) meeting the specified requirements. The Designated TSTLs will be responsible for carrying out the security testing of telecom equipment as per ITSAR's requirements
- iii. Evaluation and Certification of the telecom equipment against ITSAR by NCCS.

4.6.3 Objective: The objective of NCCS is to establish and operationalize a framework of telecom security testing and certification within the country. It is achieved through ComSec scheme. The scheme along with all related process documents have been published on NCCS web portal.

4.6.4 NCCS has mainly 3 divisions which is as under:

- i. Security Assurance Standards (SAS) division: This division is assigned the task of developing security standards and requirements for ICT equipment. The division is responsible for developing test processes, test suites, security test standards, recommending test tools and notifying contemporary security features for various network elements of telecom network. The SAS unit is preparing the security requirements/standards called Indian Telecom Security Assurance Requirement (ITSAR) for network elements (or a class of network elements) and notify them.

A total of 27 ITSARs have been published for Key Network elements of 4G and 5G along with other Network Elements.

- ii. Security Lab Recognition (SLR) division: This division is responsible for creating framework for establishing and operationalizing the telecom security test labs in India in private and public sector by recognizing the telecom security testing labs, notifying telecom security test lab recognition mechanism, and conducting infrastructure assessment for recognition of telecom security test labs. The framework comprising of Documents for Designation requirement for Telecom Security Test Laboratories (TSTL), Procedure for Designating TSTL and Application forms for Designation of TSTL have been approved by DoT HQ and published on NCCS Web Portal.

Security Certification Ecosystem is now getting ready and NCCS has already initiated the action for recognition of the Telecom Security Test Laboratories (TSTL) for all the published ITSARs. Also, NCCS has started receiving applications from various applicants for TSTL designation.

One TSTL viz., M/S Acucert Labs LLP has been designated for testing IP Router and Wi-FiCPE on 30/12/22.

- iii. Security Certification and Headquarters (SC& HQ) division: This division is mandated to develop framework of issuing security certificate for the successfully tested products. The work includes evaluation of the test results from telecom security test labs and recommending issuance of security certification based on the testing performed by recognized labs. SC& HQ division is also responsible for over-all coordination amongst the three verticals and work of NCCS headquarters.

As part of new IT initiatives and to provide impetus to Ease of Doing Business, a Single Window MTCTE web portal is getting integrated with Security Certification portal to facilitate automated handling of the Security Testing and Certification of telecom products. Further, the security certification ecosystem is getting ready to start accepting voluntary certification by end of F.Y. 2022-23 for Telecom products where ITSARs are already published by NCCS.

4.6.5 Key initiatives and Achievements:

- i. Publication of ITSARs for 4G, 5G and other Network elements: As part of new initiatives, 27 ITSARs were published, so far, for Key Network elements for 4G and 5G along with other Network Elements. Out of these, 11 ITSARs pertain to 5G Technology Network Elements. List of ITSARs published:
 - a) 5G Core Network Functions (11)
 - 1. User Plane Function (UPF)
 - 2. Session Management Function (SMF)
 - 3. Unified Data Management (UDM)
 - 4. Network Repository Function (NRF)
 - 5. Network Data Analytics Function (NWDAF)
 - 6. Service Communication Proxy (SCP)
 - 7. Security Edge Protection Proxy (SEPP)
 - 8. Access and Mobility Management Function (AMF)
 - 9. Authentication Server Function (AUSF)
 - 10. Network Exposure Function (NEF)
 - 11. Non-3GPP Interworking Function (N3IWF)
 - b) 4G Network elements (6)
 - 12. MME (Mobility Management Entity)
 - 13. S-Gateway (Serving Gateway)
 - 14. P-Gateway (Packet Data Network Gateway)

15. PCRF (Policy and Charging Rule Function)
 16. HSS (Home subscriber server)
 17. E-Node – B (4G Access Network Element)
- c) Other Network Elements/Functions (10)
18. IP Router
 19. Mobile Device
 20. Pluggable (U)ICC
 21. Wi-Fi (CPE) Modem
 22. Cell Broadcast centre
 23. Transmission Terminal Equipment
 24. Optical Network Terminal (ONT) - PON family Broadband
 25. Optical Line Terminal (OLT) – PON family Broadband
 26. Private Automatic Branch Exchange (PABX)
 27. Cryptographic Controls
- ii. Participation by NCCS in Bengaluru Tech Summit 2022: To showcase the significant capabilities developed by NCCS to Industry and other stakeholders, NCCS participated in Bengaluru Tech Summit 2022 which was organized from 16 Nov 2022 to 18 Nov 2022. The event was attended by more than 4.5 Lakh people which encompassed industry leaders, technocrats, young innovators, investors, R&D professionals & academia, and policy makers across various domains working on IT, biotech, Deeptech and other future unravelling technologies. During the event, a session on ‘Indian Security requirements for Telecom Networks- 5G and beyond’ was also coordinated by a team of officers comprising of NCCS and TEC to sensitize all the stakeholders for Indian Telecom Security Ecosystem.



- iii. Signing of Tripartite MoU with IITM and IITM Pravartak: NCCS has signed the Triparty MOU for 5 years with IIT Madras and IIT Madras Pravartak Technologies Foundation on 15.10.2022 taking up development of ITSARs, Test Schedules and Test Procedures (TSTP)s, and capacity building activities in the field of Telecom security requirements and other allied works.

- iv. MoU with IITB: NCCS has signed an MoU with IIT Bombay on 19.01.23 for developing security standards for important Network functions like NG Firewall/IDS/IPS/LI and some more 5G NFs along with TSTPs.

4.7 Network Operations Control Centre (NOCC)

NOCC monitors and controls parameters of RF carriers being uplink from more than 1590 Satellite Earth Stations/Teleports/DSNGs and more than 2,84,000 VSATs. NOCC has endeavored to provide interference free environment to various satellite users in country while providing clearances in respect of their frequency plan/carrier plan, link budget, antenna self-test parameters etc. to applicant agencies.

4.7.1 The Network Operations Control Center (NOCC) performs important functions of enforcement and regulatory. Broadly its functions are as follows:

- i. Operational control, coordination and monitoring/regulation of all the satellite based communication services [Like VSAT applications, Broadcasting, Direct to Home (DTH), Digital Satellite News Gathering (DSNG), Internet Service Providers (ISPs), etc.] in India through Indian/Foreign satellites.
- ii. Mitigation of RF (Radio Frequency) interferences for satellite communications and coordination with different satellite administrators/agencies for resolution of the interference problems and handling different satellite user's complaints.
- iii. Testing/validating conformity of the earth station/DSNG transmit antennae of the licensees to the latest ITU/TEC standards.
- iv. Analyzing and processing of frequency plan/ carrier plan and link budget proposed by various SATCOM services licensees; preparation of their final frequency plan and link budget and issuance of approvals for the same.
- v. Handling contingency operations in case of failure of transponder or satellite.
- vi. Issuing uplink permissions to the different satellite service providers and verification of compliance/ conformity of license conditions by them.
- vii. Coordination with different stakeholders for introduction of new Satellite Technologies & Systems in the Network viz. LEO, MEO and High Throughput Satellites (HTS), etc. and providing assistance/ inputs in this respect to the concerned decision making bodies/ Committees.
- viii. Coordination with Telecommunication Engineering Centre (TEC) on Interface Requirements/ Specifications for Satellite Systems.
- ix. Apart from above, NOCC is in the process of setting up Central Monitoring Facility (CMF) Project for automatic monitoring of multiple-satellites over India, satellite-based communication services, partial/spill over coverage (from across the borders) and spot-beam coverage areas.

4.7.2 Regulation of space segment: NOCC has been performing regulatory function for usage of space segment by VSATs, NLD (National long distance services), ILD (International long distance services), Broadcasting, DTH (Direct-To-Home) and HITs (Headend in the Sky) services as per their allocation, presently on 34 Satellites Viz. GSAT-6, 7A, 8, 10, 11, 14, 15, 16, 17, 18, 19, 29, 30, 31, Measat-3, 3B, SES-7, SES-8, SES-9, ST2, IS-17, IS-20, IS-33e, IS-39, IS-902, NSS-12, Asiasat-5, 7, 9, Chinasat-12, Thaicom-4, PALAPA-D, CMS-01 and Inmarsat-I5F4. NOCC, issued 98 uplink permissions and 59 frequency plan approvals to various applicant agencies during Jan-Dec 2022.

NOCC, during Jan-Dec 2022, monitored and controlled various transmission parameters of RF carriers being uplink from more than 1590 Satellite Earth Stations/Teleports/DSNG and more than 2,84,000 VSATs. NOCC also resolved the RF interference due to cross polar carriers, FM (Frequency modulation) Radio pick up, unauthorized pickup, DSNGs operations, other satellites from INSAT and other satellite administrators etc. by identifying source of the suspected RF interference.

NOCC carries out the Mandatory Performance Verification Testing (MPVT) of antennae of satellite earth stations and DSNG. During Jan-Dec 2022, NOCC carried out mandatory performance verification testing of 61 antennas of different type of satellite earth stations and DSNG before inducting them into network.

During Jan-Dec 2022, NOCC has issued 49 nos. of uplink permissions for live telecast of events of national and international importance and NOCC played important role in keeping the Indian SATCOM networks interference free.

4.8 CONTROLLER GENERAL OF COMMUNICATION ACCOUNTS (CGCA) OFFICE

4.8.1 Controller General of Communication Accounts has the following sections:

- i. Admin and Coordination
 - a) Cadre Management of Group C and B (Non-Gazetted) DoT is carried out
 - b) Establishment of Heads of Circles (DoT Field Units) is carried out
 - c) Asset Management. Scrutiny and approval of civil and electrical estimates for repair and renovation of field units
 - d) General Administration
- ii. IA Section
 - a) Internal Audit of field units of DoT and its attached offices, autonomous bodies and DoT Wings
 - b) Review of Internal Audit reports, formulation of Internal Audit policy/ Methodology for DoT.
- iii. BA&IT Section
 - a) Bank Migration of pensioners from various banks to SAMPANN platform is underway.

- b) Operation and Maintenance of Comprehensive Pension Management System (SAMPANN)
 - c) Conducting National Pension Adalats/ Digital Adalats/Review Conferences.
 - d) Review of State of Work (SWR) Report and Expenditure of field units
 - e) Development & Maintenance of Softwares and Website.
- iv. Revenue Section:
- a) Confirmation/Amendment/Extension/Review of Bank Guarantees by CCAs.
 - b) Release of PBGs and FBGs upon cancellation, termination, expiry of licenses.
 - c) Monitoring of Decentralized (Non-Access) Licenses and their assessments
 - d) Appellate Authority for Assessments carried out by Pr. CCAs/ CCAs.
 - e) Monthly/Progressive SUC collection GSM/CDMA/BWA/VSAT)
 - f) Several types of RLO Licenses
- v. Coord & Admin Section
- a) Cadre management of Non-Gazetted Group 'B' Group 'C' officials of all the field units (Pr. CCAs/CCAs/Jt. CCAs/NICF)
 - b) Monitoring of Asset Management activities by CCA offices.
 - c) Monitoring of court cases of field offices through LIMBS software.
 - d) Maintenance of service book & Fixation of pay, granting of leaves, Tours & LTC, promotional & retirement of all the Pr. CCAs/CCAs/Jt. CCAs (I/C)
- vi. Manuals & Codification Section
- a) Preparation of Telecom Accounts and Finance Manual

4.8.2 Achievements/ Initiatives/ Vision forward:

- i. Key Initiatives of IA Section (CGCA):
- a) ARMS (Audit Reporting and Monitoring Software) 2.0 i.e. SACHeT Software is currently under development. This software shall bring the whole audit lifecycle online. It will enable generation of Reports/MIS for all the audits being carried out in DoT.
 - b) The Annual Plan for 2022-23 for conducting inspections by office of CGCA is prepared and inspections of 20 units have been completed up to November-2022. Similarly, the annual plan for conducting inspections has been got prepared by all Pr.CCA, CCA and Jt.CCA offices for the units coming under their jurisdiction and progress of the inspections is being watched.
 - c) Systems Audit of Pension disbursement platform SAMPANN has been started.

ii. Key Initiatives of Budget & Accounts and IT Section (CGCA):

a) Review of State of Work Report (SWR)

State of Work Report (SWR) is designed to monitor and give intelligent inputs on efficiency and effectiveness of functioning of Pr. CCAs/CCAs/Jt. CCAs. Systematic monitoring of vital parameters of field units through the software results in a seamless and smooth functioning of all the 28 field units spread across the country.

State of Work Report 3.0 e-Sanklan	
Existing provisions	At present SWR 2.0 is running on intranet with physical server at DoT HQ. Parameters pertaining to Pension, GPF, PVA, Bank Reconciliation, Pension Grievances & Audit Paras are incorporated in SWR 2.0.
Achievements	<p>a) Third version of State of Work Report was launched which is an online version which is hosted on NIC Cloud with the URL https://esankalan.dot.gov.in/</p> <p>b) Along with this, Revenue, Ranking and SAMPANN parameters were developed and added to the new version</p>

b) Pension Adalats/ National Pension Adalats:

In accordance with directions of Ministry of Personnel, Public Grievances and Pensions, Department of Pension and Pensioners' Welfare (DoPPW), Digital Pension Adalats are held by frequently by all the Telecom circles for better coordination with pensioners and timely redressal of grievances. 19 Pension adalats have been held and one National Pension Adalat has been held.

c) Development of CGCA Centralized website



1. A centralized website of CGCA (<http://cgca.gov.in>) has been developed and soft launch of the website done as per GIGW compliance with SSL Certification.

CGCA Website	
Existing provisions	The website contains information and other frequent activities being performed by CGCA office and its field units i.e. all Pr. CCA/CCA offices.
Achievements	SSL Certification, security audit and domain renewal of website has been completed successfully. A link for Audit Reporting and Monitoring System (ARMS) has been provided, for monitoring of Internal Audit plans & Reports

Regular maintenance and upkeep of CGCA Website is being done.

- iii. Key Initiatives of Revenue Section (CGCA):

- a) Bank Guarantee Management

Number of BGs rationalized of TSPs 810. Amount of BGs of rationalized TSPs is Rs 13980.57 crores. Amount of BGs released to TSPs after rationalization is 11843.84 crores. No of BGs of TSPs released is 694. Number of BGs of decentralized licenses released after obtaining NDCs is 70 and the amount is Rs 7.91 crores.

- b) Monitoring of Decentralized (Non-Access) Licenses:

New License entry in software by CCAs and monitoring of Assessment of Licenses by CCAs.

- c) Modules in SARAS

SoP for SUL module, Grievance Module in SARAs have been prepared and circulated to all field offices.

- d) SUC

Monitoring of assessment of SUC based on AGR finalized by LFA wing, DoT HQ in respect of all TSPs and monthly/progressive collection of SUC in respect of GSM/CDMA/BWA/VSAT

- e) RLO

Monitoring of RLO Licenses in respect of Maritime Mobile Station License (Fishing Trawlers), Maritime Mobile Station License (Ships), Short Range UHF Radio (Hand held license).

- f) Appeals

Receipt of representations from ISPs and seek para wise comments from CCAs and dispose the appeals and referring to LFP wing, DoT in cases where clarifications are needed. Appellate Authority for Assessments carried out by Pr. CCAs/ CCAs. Number of appeals against assessment of decentralized licenses disposed off is 36. Two appeals disposed off in favour of operators.

g) Reports

Submitted Committee reports on reduced compliance burden on licenses, recovery of outstanding dues of decentralized licenses.

iv. Key Initiatives of Admin and Co-ordination Section (CGCA):

a) Cadre Management of Group C and B.

O/o CGCA is the cadre controlling authority of Group 'B' Non-Gazetted and Group 'C' staff working in 'Accounts & Finance wing' of DoT. To utilize and optimize the work force in the all the unit offices, O/o CGCA is in continuous process to frame and amend Recruitment Rules. Recruitment of 129 Group C conducted (MTS, LDC and JA). Recruitment of 117 Group C officials is under process and has been taken up with SSC.

AAO LDCE 2022 has been conducted on behalf of Department of Posts as per directions of Hon'ble Minister for Communications. All India exam has been carried out for 616 vacancies in which around 8000 candidates applied from Department of Telecommunications and Department of Posts.

b) Ranking Exercise of DoT Field Units

As per directions of Hon'ble Minister of State for Communications a ranking exercise of 23 field units of DoT was carried out in which 13 parameters were taken and each unit was ranked based on these parameters. The requisite report is in the final stages of finalization.

c) Asset Management

All data for GLIS (Government Land Information System) portal was collected and collated for uploading on the site.

Issuance of Administrative approval and expenditure sanctions of field units estimates are done by this office. This year estimates of 14 Circles have been scrutinized and an amount of Rs 5.50 crores has been approved for renovation and repair works.

Work for creation of Centralized Digital Asset Register software is in progress which shall bring monitoring of all digital assets of DoT under one system.

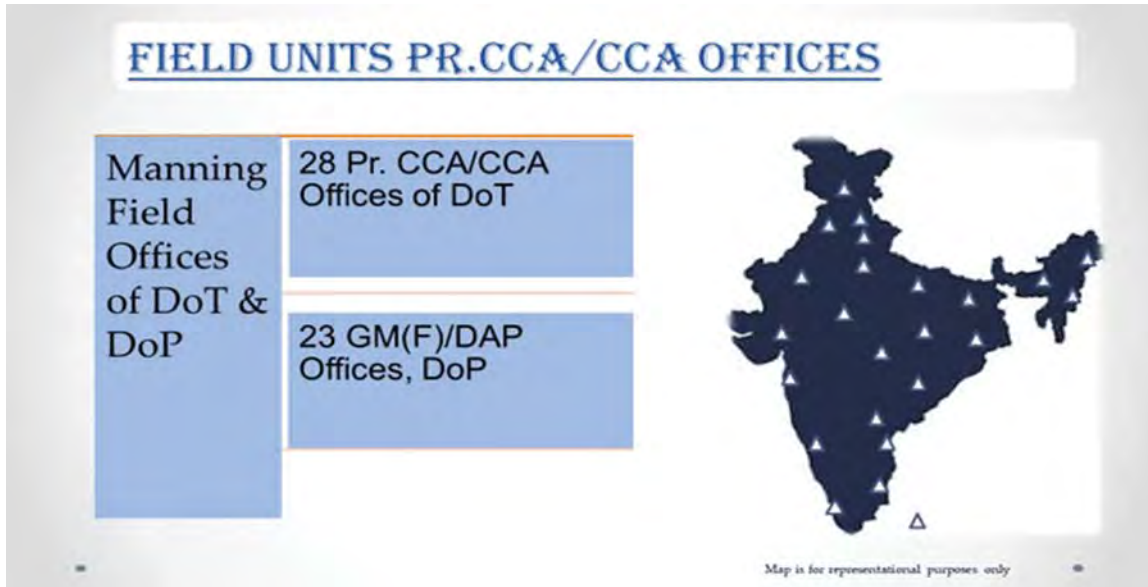
d) Implementation of e-HRMS

Work of implementation of e-HRMS is at its final stages of completion. 1508 officials have been onboarded. The service books of 1508 officials and officers have been verified, scanned and uploaded.

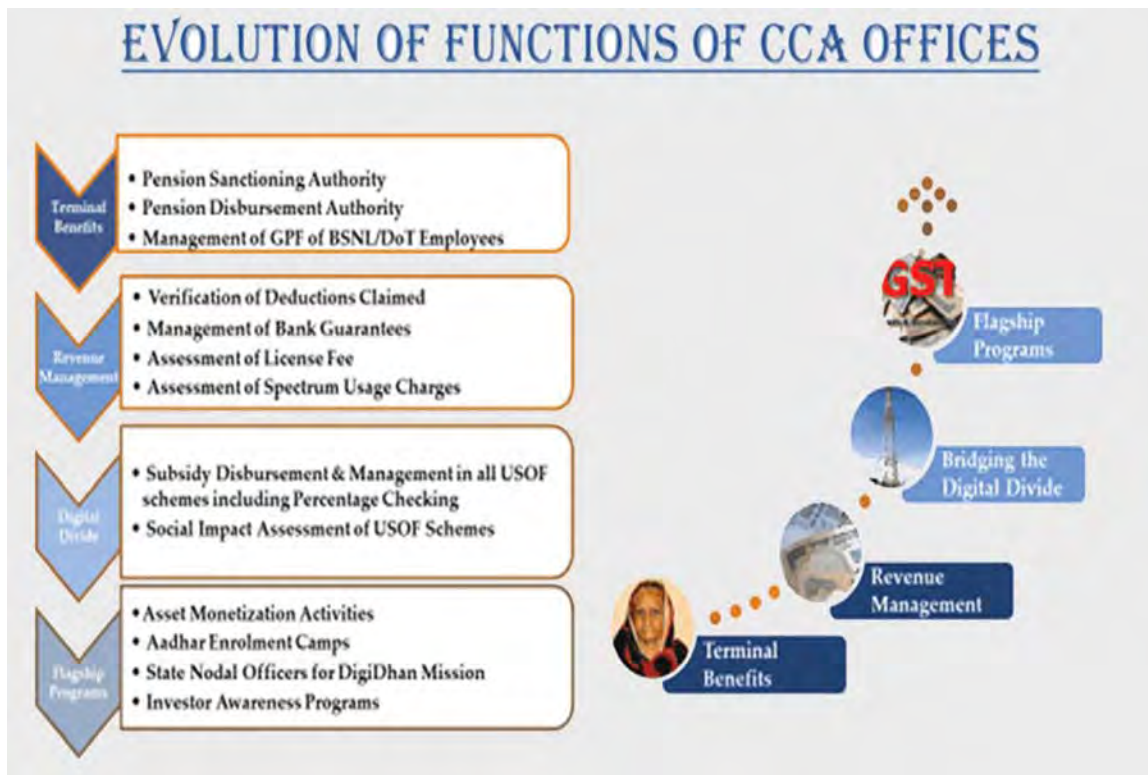
e) Implementation of Mission Karmyogi

Work of FRACing has been carried out for O/o CGCA by identifying unique positions in the office and identifying domain competencies of positions so that they can be uploaded on iGoT platform for smooth implementation of Mission Karmyogi.

4.8.3 Field Offices – Pr. CCAs, CCAs and Jt. CCAs:



The field offices of DoT, Accounts and Finance wing, Pr.CsCA, CsCA and Jt.CsCA (I/C) have made sincere efforts and progress towards improving their processes, service delivery, governance and ecosystem. They have achieved this by setting up targets and executing them by adopting practices that are innovative, inspiring and result oriented. The field units have shown perseverance in carrying out innovative activities that are feasible in nature and in return resulting in smooth functioning of the Department. The technology has played a great role in building up the innovative ideas and its use has been turned out to be productive and advantageous. PrCCA offices are also performing the role of Regional Monitoring Cell.



Chapter 5
**Public Sector Undertakings and
Autonomous Bodies**

Chapter 5

Public Sector Undertakings and Autonomous Bodies

5.1 BHARAT SANCHAR NIGAM LIMITED (BSNL)

5.1.1 Role and functions

- i. Bharat Sanchar Nigam Limited (BSNL) was formed on 1st October 2000 by Corporatisation of the erstwhile Department of Telecom operation & Department Telecom Services. The company has taken over the erstwhile functions of the Department of Telecom in respect of provision of telecom services across the length and breadth of the country excluding Delhi and Mumbai. BSNL has large no. of work force of around 60,750 as on 31-12-2022 BSNL is a 100% Govt. of India owned Public Sector Undertaking.
- ii. BSNL is a technology-oriented company and provides all types of telecom services namely telephone services on Wire-line, GSM Mobile Services including 2G, 3G, 4G & Value added Services (VAS), Internet & Broadband services including Fiber to the Home (FTTH), Wi-Fi services, Data Center Services, Enterprise Data Services (such as Leased circuits, MPLS VPN etc) , National Long Distance Services and International Long Distance Services.
- iii. The company has also been in the forefront of technology with 100% digital new technology switching network. BSNL nation-wide telecom network covers all District headquarters, Sub-Divisional headquarters, Tehsil headquarters and almost all the Block Headquarters.
- iv. BSNL Vision
 - a) Be the leading Telecom service provider in India with global presence.
 - b) Create a customer focused organization with excellence in sales, marketing and customer care.
 - c) Leverage technology to provide affordable and innovative products / services across customer segments.

5.1.2 Highlights

The details of Achievement for the Financial Year 2021-22 & 2022-23, financial performance and Training ect. of BSNL are given as under: -

i. Achievement during financial year 2021-22: -

S. No	Item	Unit	Year 2021 - 22	
			Status as on 01.04.2021	Status as on 31.03.2022
1	Total Telephone Connection	Lakh	1249.60	1211.74
1 (a)	Wire-line	Lakh	66.49	75.09
1 (b)	Mobile	Lakh	1183.10	1136.65
2	Total Switching Capacity	Lakh Lines	1409.96	1362.17
2(a)	Wire-Line	Lakh Lines	247.96	220.40
2(b)	Mobile	Lakh Lines	1162.00	1141.77
3	Broadband (Wireline + Wireless)	Lakh	252.33	264.13

ii. Status of telecom network during Financial Year 2022-23 (up to 30.11.2022)

S. No	Item	Unit	Year 2022 - 23	
			Status as on 01.04.2022	Status as on 30.11.2022
1	Total Telephone Connection	Lakh	1211.74	1146.51
1 (a)	Wire-line*	Lakh	75.09	70.91
1 (b)	Mobile	Lakh	1136.65	1075.60
2	Total Switching Capacity	Lakh Lines	1362.17	1318.23
2(a)	Wire-Line	Lakh Lines	220.40	177.35
2(b)	Mobile	Lakh Lines	1141.77	1140.88
3	Broadband (Wireline + Wireless)	Lakh	264.13	251.28

* Wire-Line connection =(Direct Exch. Line + FTTH Voice + ISDN PRIs) as on 31.03.2022 onward.

5.1.3 Financial performance:

The details of profit / loss figure for the year, 2019-20, 2020-21, 2021-2022 & 2022-23 (up to 30.09.2022) are given as under:

(Figures in Rs. Crore)

Financial Year	2019-20	2020-21	2021-22	2022-23 (up to 30.09.2022, Un-audited)
Total income	18,906	18,595	19,053	9,366
Total expenditure	34,406	26,036	26,034	13,429
EBITDA	-6,879	1,177	944	494
Net profit	- 15,500	- 7,441	-6,982	-3,589

5.1.4 Telecom Factories:

BSNL Telecom Factories are In-house manufacturing units of the BSNL and located at Kolkata, Gopalpur, Kharagpur, Jabalpur, Bhilai, Richhai and Mumbai. These factories are engaged in production of PLB HDPE Telecom Duct, Splice Closures, SIM Card, OFC Accessories, SS Drop wire, Jointing Kits, etc.

Amidst constraints of decreasing work force, factories have tried their best to meet the requirement of various telecom goods in the BSNL field units during the year 2022-23 (April 22- Oct 22). During the period, Telecom Factories have supplied around 5976.1 Kms of PLB HDPE Ducts. In financial terms, Telecom Factories have achieved Rs. 37.3 Cr during the period April 22 – Oct 22. Details are as under:-

Telecom Factory BA	Achievement 2021-22 (Rs. In Cr)	Target for 2022-23 (Rs. in Crore)	Achievement 2022-2023 (up to October, 2022 (Rs. in Crore)
Kolkata	27.17	52	14.28
Jabalpur	9.21	40	2.45
Mumbai	31.38	39	20.57
Total	67.76	131	37.3

During the April 2022 to Oct. 2022, the quantitative performance of Telecom Factories is as under: -

Items	Achievement 2021-22	Target (2022-23)	Achievement 2022-2023 (up to October, 2022)
PLB HDPE Duct (Kms)	13,232	24,000	5,976.1
Splice Closure	132	75,000	25,508
SS Drop Wire (Kms)	0	1,600	190
SIM Card	6,000	35,00,000	3,79,000
Jointing Kits	700	10,000	2,311
BHT	242	1,000	-
IPM	-	17,000	-
LJU	-	12,000	-

5.1.5 International Training and other events

Training is ancillary system to support various business units of BSNL to develop HR growth in terms of competency/expertise in telecom for sustaining business in competitive market scenario.

i. In-House Trainings:

BSNL is having 9 training centers across the country with head quarter at ALTTC Ghaziabad. Training centers conduct various trainings as per the need of field units and to equip its employees with required knowledge and skill.

Brief of various important in-house trainings conducted during April 2022 to October 2022 (till 12.10.2022):

S. No.	Type of Course	No. of Course	No. Of Trainees
1	In-service	142	2,250
2	Seminar/Workshop	64	2,608
3	Induction	3	6
4	WEBINAR	231	5,862

ii. Training Revenue:

BSNL training centers provides wide range of training programs to various levels of non-BSNL trainees, viz., students/individuals, Govt. or Pvt. Organizations, etc on payment basis.

During the period from April 2022 to October 2022, revenue of Rs 12.65 Cr was generated by imparting training to non BSNL trainees and by sharing of training infrastructure.

iii. Domestic External Training:

Staff deputed to attend/participate in Training Programs/ workshops/ etc. events conducted by external organization dealt by Training Cell, BSNL CO.

Officers deputed to domestic external training during April to November 2022 are 46 Nos.

iv. International Training Conducted at BSNL Training Centres:

ALTTC is a Centre of Excellence for Fixed and Wireless Broadband, Cyber Security and Internet of Things (IoT) for Asia-Pacific Region of International Telecom Union (ITU).

BSNL has conducted total 4 ITU courses at ALTTC Ghaziabad and 3 APT courses at ALTTC Ghaziabad, BRBRAITT Jabalpur and RGMTTC Chennai from April, 2022 to September, 2022. Further, 3 ITU courses are scheduled from October, 2022 to December, 2022 at ALTTC Ghaziabad.

- v. Planned Activities from October, 2022 to March, 2023:
- Motivational Training to 7,400 BSNL Frontline Staff shall be conducted under Customer/Citizen Centricity Program.
 - JTO Induction training to 543 LICE qualified candidates shall be conducted.
 - JE Induction training to 412 LICE qualified candidates shall be conducted.
 - It is proposed to conduct training of BA Heads of BSNL.
 - Bridge and MCTP courses are proposed to conduct for the executives of BSNL.
 - RFP floated to hire one of the top IIMs for Transformational Leadership Training to GMs and above Group 'A' level officers of BSNL.

5.1.6. Development of Telecommunication Facilities in Selected Areas

- Special Component Plans: Annual Plan of BSNL pays special emphasis on accelerated growth of telecommunication facilities under Special Component Plans in North Eastern Region.
- Development Status:- Achievement during the financial Year 2021-22 of the North East Region are as follows:-

S. No	Items	Unit	Status as on 01.04.2021	Status as on 31.03.2022	Achievement during the year 2021-22
1	Total Switching Capacity	Lakh Line	57.86	51.86	-6.00
1 (a)	Wire-line	Lakh Line	8.61	7.08	-1.53
1 (b)	GSM	Lakh Line	49.25	44.78	-4.47
2	Total Telephone Connection	Lakh	46.04	48.05	2.01
2 (a)	Wire-line	Lakh	1.54	1.90	0.36
2 (b)	Mobile	Lakh	44.50	46.15	1.65
3	Broadband (Wire-line+ Wireless)	Lakh	6.59	6.92	0.33

- Network Status of NE Region States: - The status of telecom facilities as on 30.11.2022 in each of the state of North East Region is shown in the following table: -

S.No.	Name of State	Telephone Exchange	Total Capacity (Wire-line +Wireless) in Lakh Line.	Total Del (Wire-Line + Wireless) in Lakh.	Broadband connection (Wire-Line+ Wireless) in Nos.
1	Assam	401	23.12	34.065	3,04,853
2	NE-1	155	13.64	11.067	2,03,240
2 (a)	Meghalaya	42	4.51	3.524	83,065
2 (b)	Mizoram	39	2.56	2.731	33,346
2 (c)	Tripura	74	6.57	4.812	86,829
3	NE-II	141	11.93	3.486	1,17,001
3 (a)	Arunachal Pradesh	68	5.16	1.924	53,131
3 (b)	Manipur	41	3.90	0.810	32,365
3 (c)	Nagaland	32	2.87	0.752	31,505
4	Sikkim	32	1.38	0.437	40,810
	NE Region	729	50.57	49.054	6,65,904

- iv. Tele-density: Status of telephone connections in N.E Region and the tele-density State/Circle- wise as on 31.10.2022 are given in the following table:

Name of State	Projected Population as on 31.10.2022 (in thousand)	Telephone connection of BSNL	%Tele-density by BSNL	% Tele-density by All Operators	% Market share of BSNL
Assam	37,365	34,44,622	9.22	66.34	13.90
NE-1	8,635	11,06,220	12.81	78.28	11.88
NE-II	7,077	3,55,317	5.02		
Sikkim	685	43,423	6.34	*	*
Total NE Region	53,762	49,49,582	9.21	-	—

* The figure of tele-density by all operator and market share for Sikkim is not available separately as this information is compiled for LSA viz. West Bengal.

5.1.7 Measures undertaken by BSNL to improve its financial condition

BSNL management has taken various steps for increasing the revenue to stay competitive in the market. It has been focusing to protect / retain existing revenue stream, increase market share from Fixed Voice, Broadband and Mobile Service, increase the reach and coverage of Fixed Broadband and Leverage IT to improve productivity & customer delivery. The steps taken for revenue enhancement under various Business verticals are as under:

i. Mobile Services

- a) GSM expansion project under name Phase VIII.4 Scope & plan: BSNL has started Phase VIII.4 GSM expansion Project with the aim of:
 1. Replacement of old equipment which are having high operational cost and AMC.
 2. Addition of 3G capacities for increasing 3G footprints.
 3. Introduction of 4G services along with IMS for VoLTE functionality.
- b) GSM Mobile Network - BSNL Mobile coverage and provide Mobile telephone connection on GSM technology (as on 30.11.2022)
 1. BSNL has already covered all the District Headquarters of the country with GSM services. It has covered 714 out of 714 District HQs, Block HQs 6,470 out of 6,538 , National Highway 67,720 Kms out of 77,706 Kms, State Highways 1,19,518 Kms out of 1,63,612 Kms and Railway route 50,199 Kms out of 60,516 Kms.etc. BSNL has already covered 4.35 Lakhs villages by GSM services.
 2. BSNL has GSM customer base of 107.56 million as on 30.11.2022.
- c) All India Coverage of Mobile (as on 30.11.2022):

Parameters	Total	Covered	%Coverage
District Headquarter (DHQ)	714	714	100
Block Headquarter (BHQ)	6,538	6,470	98.96
Inhabited Villages	6,41,525	4,34,937	67.80
National Highway (Km)	77,706	67,720	87.15
State Highway (Km)	1,63,612	1,19,518	73.05
Railway Route (Km)	60,516	50,199	82.95

ii. **Wire-line Network:-**

- a) Replacement of obsolete legacy Wire-line exchanges by Next Generation Network (NGN) Switches: This up gradation has helped in continuance of services to the customers reduced operational issues related to maintenance of wire-line network by making the core network concentrated and will also result in saving of electricity consumption. Details of NGN Project & Physical achievement as on 30.11.2022:

S.No.	Parameter	Unit	As on 30.11.2022
1	Total No. of Exchange	Nos.	23,902
2	Total Switching Capacity Wire-line	Lakh Lines	177.35
3	Total Direct Exchange, Wire-Line Connection	Lakh Lines	40.283
4	FTTH Voice Connection	Lakh Lines	25.500
5	ISDN PRIs	Lakh Lines	4.070
6	VNOs	Lakh Lines	1.059
7	Total connection (Wire-Line + FTTH Voice + PRIs+VNOs)	Lakh Lines	70.912

- b) Broadband Services: BSNL had launched its Broadband services in January 2005 using ADSL2+ technology. 13.75 lakh connections with the installed capacity of 100.18 lakhs broadband ports are working as on 30.11.2022. BSNL nation-wide telecom network covers all District headquarters (DHQ), Sub-Divisional headquarters (SDHQ), Tehsil headquarters (THQ), cities and almost all the Block Headquarters (BHQ).

- c) All India Broadband Coverage (as on 30.11.2022):

Parameters	Total	Covered	%Coverage
DHQ	714	693	97.06
BHQ	6,538	6,004	91.83
Cities	4,322	4,237	98.03
Villages	6,41,525	1,65,560	25.81

- d) FTTH Service: As per the growing requirement of the customers for higher speed on internet, BSNL has launched FTTH services as well with brand name as Bharat Fiber. 26.06 Lakh no of FTTH customers are provided the Fiber broadband connection as on 30.11.2022.

5.1.8 Events



Visit of Hon'ble Minister of Communication in HOCC held on 4th and 5th August, 2022 at BSNL CO New Delhi



Visit of Hon'ble Prime Minister alongwith Minister of Communications and Minister of State for communications at India Mobile Congress-2022 Pragati Maidan, New Delhi

5.1.9 Staff Strength

Total number of working employees are as on 31.12.2022 (as per ERP Data base).

Group	Number of employees
Executive	29,345
Non-Executive	31,405
Total	60,750

5.2 Mahanagar Telephone Nigam Limited (MTNL)

Mahanagar Telephone Nigam Limited (MTNL) was incorporated on Feb.28, 1986 under the Companies Act as a wholly owned Govt. Company and on April, 01 1986, assumed responsibility for the control, management, operation of the telecommunications services in the two Metropolitan Cities of Delhi and Mumbai. The jurisdiction of the MTNL comprises the city of Delhi and the areas falling under the Mumbai Municipal Corporation, New Mumbai Corporation and Thane Municipal Corporation for providing fixed line and WLL based limited mobility services. For Cellular services the company has the license to provide services in Delhi including NCR (towns of Ghaziabad, Faridabad, Noida and Gurugram) and in Mumbai including Navi Mumbai, Kalyan & Dombivili.

MTNL is a complete telecom solution provider, providing the following wide range of services to its esteemed customers:

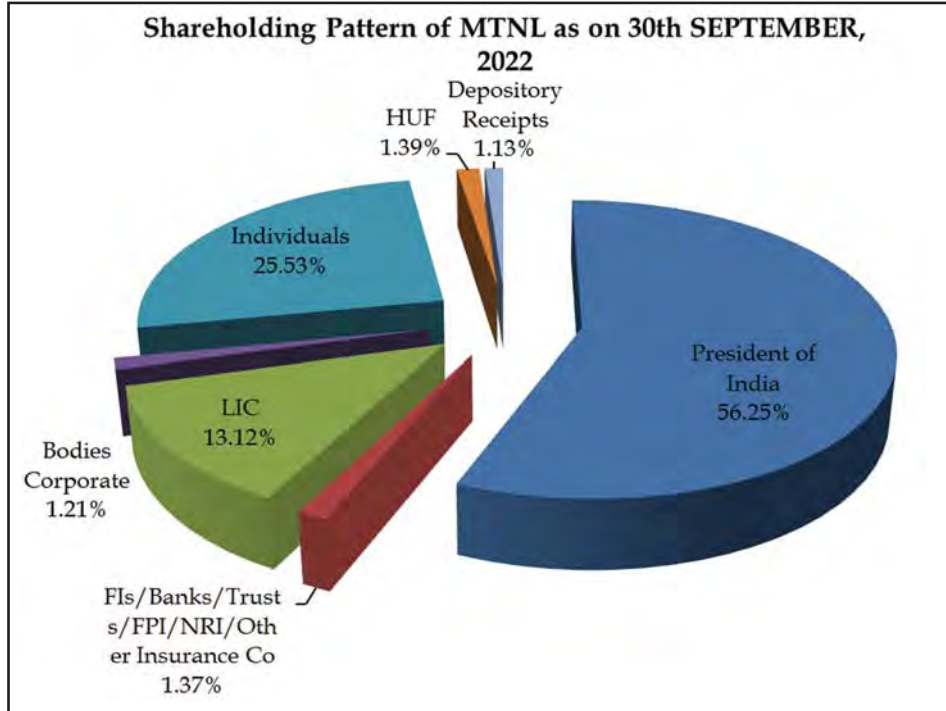
- i. Basic Telephone Service
- ii. Cellular Mobile Service (both 2G / 3G)
- iii. Internet Service
- iv. ISDN
- v. Broadband
- vi. Leased Circuits
- vii. IN Services
- viii. Wi-Fi hot spots
- ix. Data Centre Services

In addition, MTNL is providing a host of value added services to its wireline & wireless customers. VAS is normally a third party item & is provided on franchise model on revenue share basis as & when available.

Share Capital: The authorized share capital of the company is Rs.10,000 crores. The paid-up share capital is Rs.630 crores divided into 63 crore Equity shares of Rs.10 each. At present 56.25% equity shares are held by the President of India and remaining 43.75% shares are held by foreign institutional investors, financial institutions, banks, mutual funds ADR holders and others including individual investors.

The Shares of the Company are listed with principal Stock Exchanges of the Country i.e. Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). The Shares has been delisted on OTCQX International Market w.e.f. 03.10.2022.

Share Holding Pattern:



5.2.1 Physical Performance

During the year 2022-23 (upto Sep 2022), there is total disconnection of 1,67,333 connections (including Fixed line, GSM & Broadband). Details of achievements of MTNL Delhi & Mumbai during 2022-2023 (upto September 2022) are as follows:

Achievements

S.No.	Items	Achievements 2022-23 (upto Sep'22)	
		Delhi	Mumbai
1	DELS (includes Landline, GSM & Broadband) (Net)	56,390	1,10,943
2	FTTH (Net)	1,577	2,628
4	Optical fiber Cable (in Route Kms)	53.894	47.529
5	Optical fiber Cable (in Fiber Kms)	1093.374	407.100

Status as on 30th Sep, 2022 of total Network Capacity & subscriber base in respect of Fixed line, GSM, & Broad band services are summarized below-

S.No.	Services	Network Capacity	Subscriber base
1	Fixed Line	48,81,215	25,65,788
2	GSM	56,00,000	27,69,753
3	Broadband	16,33,756	5,78,933

5.2.2 Financial Performance

The Financial Performance of MTNL is tabulated as under:

Rs. In Crore

Item	2019-20 (Audited)	2020-21 (Audited)	2021-22 (Audited)	2022-23 (Up to Sept. 22) (Un-Audited)
Income from Services	1536.36	1303.64	1069.72	456.03
Other Income	690.66	484.77	627.18	286.69
Total Income	2227.02	1788.41	1696.90	742.72
Expenditure	5922.70	4250.20	4299.49	2129.63
PBT	-3695.68	-2461.79	-2602.59	-1386.91
Net Profit	-3695.68	-2461.79	-2602.59	-1386.91

Despite stiff competition, from other operators, MTNL has achieved a financial turnover of Rs. 742.72 Crore during the year 2022-23 (up to September 2022). During the said period MTNL posted a loss of Rs. (1386.91) crore.

5.2.3 Different Services and Projects

MTNL has planned several initiatives/ projects to improve its network capabilities and provide better quality of service to its customers. Some of the salient initiatives and projects are as below.

i. Mobile Network

- a) Launching 4G Services in Delhi and Mumbai: DoT vide Office memorandum No.30-04/2019-PSU affairs dated 29th Oct 2019 had informed that the Government on 23-10-2019 has approved the proposal of administrative allotment of spectrum to BSNL and MTNL for providing for 4G services among other things. In a modification to this decision, the Group of Ministers (GoM) constituted on the matter of "Revival of BSNL and MTNL" approved allocation of 4G spectrum to BSNL in Delhi and Mumbai in place of MTNL in its meeting held on dated 21.12.2020. MTNL had shared its Schedule of requirements (SoR) of 7000 RANs (Delhi 4000 and Mumbai 3000) with BSNL for inclusion of items in their tender.

- ii. Wireline Network:
- a) Up-gradation of the MPLS Network: MTNL is planning to upgrade the MPLS network. This will make the network future ready to handle the growing traffic needs of FTTH, MSAN, Leased line and upcoming 4G network. The MTNL requirement of MPLS equipment has been provided to BSNL for inclusion in its MPLS Tender.
 - b) FTTH Revenue Share Policy: MTNL had worked out, finalized and made operational the policy to engage partners on revenue share basis to extend its FTTH services. The Policy has been significantly liberalized by relaxing entry level barriers and removing clauses regarding turnover eligibility criteria, rollout obligations and Performance Bank Guarantee. Significant upward revision to the tune of 45% has also been carried out for the Revenue share of the partner. In the post VRS scenario challenges were observed in the O&M of the MTNL own FTTH connections due to lack of field staff. Accordingly, policy was amended to allow partners for maintenance of MTNL owned FTTH connections at 10% revenue share and one time provisioning charges of Rs 1500.
 - c) Migration of MTNL FTTH VoIP subscribers from life expired C-DoT NGN switch to BSNL C-DoT Max NG is underway: The migration has started in Delhi unit and about 12,800 customers have been migrated and total 24,000 FTTH customers are created on New hardware MAX-NG as on 12.10.2022. In Mumbai testing has been completed, approval has been sought from DoT for the migration of MTNL FTTH subscribers on BSNL network.
 - d) Migration of MTNL landline subscribers on BSNL IMS core through diversion of spare LMGs from BSNL: About 18,000 ports LMG equipment diverted to MTNL Delhi and is currently being installed at Rohini exchange. Around 70,000 ports LMG is being diverted to Mumbai from various BSNL exchange locations. 11,000 ports already installed at Dahisar and Sakivihar exchanges. Physical installation/Integration/Testing/CDR collection/Demo of LIS/LIM has been completed at Dahisar Location. The LIS/LIM testing at Dahisar was also successfully demonstrated to DoT/LEAs on 7th& 15th Sept 2022. The area transfers of working lines from 5ESS to LMG is in progress.
- 3) Procurement of BNGs for broadband network: Since MTNL's network is very old and out of AMC, MTNL asked BSNL to include MTNL BNG/BRAS requirement in its tender.
- iii. Synergy between MTNL & BSNL to reduce OPEX and CAPEX: Several Synergy/Integration measures have been undertaken are being undertaken between MTNL and BSNL to reduce the OPEX & CAPEX. The major steps are summarized as under:
- a. Synergy with BSNL in Mobile Services
 - 1 Handover of Operation & Maintenance of Mobile Services to BSNL: Operation and Maintenance (O&M) of MTNL Mobile services has been handed over to BSNL in Delhi w.e.f. 01.04.2021 and in Mumbai from 01.09.2021.

2 Operational Synergy: To increase operational efficiency and to reduce AMC Cost. Following network elements of BSNL have already been integrated and utilized:

- BSNL's OMCR & CNMC,
- EIR Integration with BSNL Pune
- SSTP,
- SPAM Filtering solution: MTNL SMS SPAM filtering solution migrated to BSNL West Zone (Pune).
- Utilization of MNPGW of BSNL for MTNL Delhi & Mumbai: MTNL MNPGW Migration to BSNL North Zone MNPGW Chandigarh has been successfully completed on 6th March 2022.

The integration of the following network elements of BSNL are under consideration for synergy:

- Consent Gateway, DLT.
- Routing of International A2P MT SMS through BSNL firewall.

b) Synergy with BSNL in Other Services:

The integration of the following network elements of BSNL are under the process of implementation for synergy:

- 1 Common NMS for MLLN.
- 2 CBCRM Replacement/AMC extension: CBCRM network is EOSL and presently being used for wireless billing/IUC and MNP billing. BSNL has been asked to share its platform for above billing. BSNL had informed that the tender has been floated for the procurement of new system.
- 3 Common CDR based billing and CRM (Customer Relationship Management) system for fixed line services for both MTNL and BSNL

iv Utilization of MTNL Assets:

MTNL has been making continuous effort to maximize revenue from renting of its Buildings/ quarters and monetization of various approved land parcels in Delhi and Mumbai through Department of Investment and Public Asset Management (DIPAM). MTNL has generated revenue of Rs 337.27 Cr. from rental of properties in the Financial Year 2021-22.

President approval for monetization of various land parcels in Delhi and Mumbai through DIPAM for identified properties was issued. Accordingly, International Property Consultant (IPC) for 5 land parcels and 398 quarters of MTNL has been appointed by DIPAM. MTNL along with DIPAM have floated an e-Auction on MSTC platform for two properties of MTNL viz. 20 Flats at Raheja Classique, Oshiwara, Mumbai and Vasari Hill Plot, Mumbai. The reserved price for the e-auction for all the 20 flats of Oshiwara flats is Rs. 20.35 Crore and

Vasari Hill Plot is Rs. 270 Crore. The e-auction was done through MSTC portal. Bids were received for Oshiwara quarters.

Meanwhile it has been intimated by DIPAM that work of asset monetization has been transferred from DIPAM to Department of Public Enterprise (DPE). Monetization of assets of MTNL, which are bid out on MSTC platform, shall also be handled by DPE.

In the recent meeting of IMG, decision of annulment of Oshiwara Quarters bids has also been taken. All the asset which were earlier dealt by DIPAM shall be now handled by DPE. Assets which can be monetized immediately has been submitted to DPE.

5.2.4 Joint Ventures and Subsidiary Companies

i. Mahanagar Telephone (Mauritius) Ltd. (MTML)

MTML is a 100% owned subsidiary of MTNL in Mauritius. The company is having license for Mobile Services, International Long Distance (ILD) Services and Internet Services. In a small Island country having a population of around 12.5 Lacs only and having Mobile Tele-density of more than 150%, MTML has been able to successfully position itself with Customer Centric Services. With patronage of more than 4,00,000 customers, MTML is able to compete well in a saturated telecom market. The company continues to be in profit for 12th Consecutive Year.

MTML is offering Mobile Services on latest state of the art technology having 4G (LTE) Services covering more than 90% of the total population and 2G/3G Network all over the Island. With increased coverage of high speed data services on 4G and migrating more and more subscribers to its 4G network, MTML customers are now generating more than 1700 TB of data every month. Data download has multiplied by more than 35% during the financial year 2021-22.

MTML became the first operator in Mauritius to launch e-SIM Service which has helped it in acquiring higher ARPU customers. MTML has also acquired licence for 5G Services in Mauritius recently. Action on procurement of equipment has been started and it is expected to launch 5G Services in commercially important areas in due course.

MTML has established its own brand CHILI in the Republic of Mauritius as trusted total telecom service provider. With more than 265 BTSs operating across the island, the quality of service is to the satisfaction of customers. Co-location with other telecom providers for mobile network has also started opening a new source of revenue for the company. MTML has been introducing innovative tariff packages to match current market dynamics with the state of art technology and is quite popular especially among youth.

MTML has also diversified into retailing of Smartphones and the business has picked up well during past two years. During 2021-22, total Smartphone Sales reached nearly MUR 40 Million which is expected to be higher during current financial year.

All the expenses of the company are paid from its own internal resources. The CAPEX for

procurement of equipment is met from its own internal resources. MTML is operating from its own building, constructed from internal resources, situated in Cyber City, Mauritius which is considered to be the heart of IT hub in Mauritius. There is no debt liability on the Company.

The company is managed by CEO, CFO and 11 more officers, all on deputation from the parent company. Other operations are managed through local outsourcing.

ii. Millennium Telecom Ltd. (MTL):

A wholly owned subsidiary of Mahanagar Telephone Nigam Limited, a Government of India CPSE, registered office in New Delhi. MTL was incorporated in February 2000.

ICT related Services being offered by MTL include Cloud services, Wi-Fi solution; project on e-governance, Managed services, Turnkey ICT solution, GIS based services, capacity building and skill development etc. MTL earned a net profit of Rs. 19.79 lakhs for the period ending 31st March 2022.

MTL's customer list includes Air India, J & K Government, Central University-(Mahendragarh) Haryana, UP Building and Other Constructions Workers Welfare Board (UP BOCWWB), Lucknow, Thane Municipal Corporation CIDCO, Film Division of India, Insurance Institute of India etc. MTL is also expanding its portfolio of service for providing generalized as well customized solutions to suit government and semi government institutions.

MTL has empanelled Business Development Associates (BDAs) for 10 years through EOI in the year 2016-17. Further, MTL has reopened the window for Empanelment of Business Development Associates in MTL through open ended EOI. MTL has around 23 empanelled Business Development Associates (BDAs) for innovative projects in ICT related fields.

iii. Mtnl Stpi It Services Ltd (MSITSL):

MTNL STPI IT Services Ltd. (MSITSL) is a 50:50 Joint Venture company of Mahanagar Telephone Nigam Limited (MTNL) and Software Technology Parks of India (STPI). MSITSL was incorporated on 31/03/2006 under the Companies Act, 1956, with authorized Capital of Rs. 50 Crores.

MSITSL has established the physical infrastructure of state of the art Tier III Data Center at Chennai on space taken on lease basis from STPI. The Data Center has server farm area of around 3500 sq. ft. and the total investment made for setting it up was Rs.477 lakhs. This Tier III Data Center is maintaining 99.98% uptime on 24X7x365.

The commercial operation of the Data Center commenced in 2009. At present, the following customers have co-located server racks for their projects and operation in the MSITSL Data Centre.

- a) The Ministry of External Affairs (MEA) has hosted Passport Seva Project at MSITSL Data Center through M/s TCS.
- b) The Directorate General of Employment & Training (DGE&T) in Ministry of Labour &

Employment has hosted National Career Project through STPI at MSITSL Data Centre.

- c) Repco Bank Ltd, M/s Repco Home finance Limited and M/s Repco Micro Finance Limited have co-located server racks for banking operation.

In addition to that, MSITSL has been offering 39 Nos workstation facilities to Repco Home Finance Ltd through STPI centre.

The details of revenue earned by the Company in previous years are as follows:

Financial Year period	Revenue in Rs (Lakhs)	Financial Year period	Revenue in Rs (Lakhs)
2009-10	196	2015-16	534
2010-11	275	2016-17	540
2011-12	297	2017-18	579
2012-13	360	2018-19	573
2013-14	388	2019-20	614
2014-15	422	2020-21	619
		2021-22	688

Ministry of External Affairs has issued the Letter of intent (LoI) to M/s TCS as implementing Agency for Passport Seva Project 2.0(PSP2.0), subsequently MEA officials confirmed our Data centre premises as Disaster Recovery Center for executing said project.

In this regard, MSITSL has selected DC consultant for expanding the Data Center server farm area by around 1200 sqft as per Tier-III standard through tendering process at an estimated cost of 6 Crore.

- iv United Telecom Ltd.(UTL):

UTL is J.V. Company of MTNL which consists of TCL, TCIL, NVPL (Nepal) & MTNL. The company provides Mobile/ILD/data services in Nepal. At present MTNL is holding 26.68% of Equity in UTL. The company has not been performing well for the last few years. All the Indian JV Partners have decided to exit from the JV and have exercised their Right to exit, on January 30, 2018 at par value.

Further, on March 31, 2021 NVPL is willing to purchase all shares of Indian JV partners at par value upon satisfactory negotiation on the terms and payment modality. NVPL initiated necessary steps towards completing related acquiring procedures, including entering into a sale purchase agreement at the earliest.

5.2.5 Human Resource:

Manpower details:

Group	Total working strength
A	201
B	1019
C	1534
D	900
TSM	2
Total	3656

5.2.6 Training: At present MTNL has two state of the art training centers one located in New Delhi and other at Mumbai.

- i. The Institute of Telecom, Technology & Management (ITTM) Shadipur, New Delhi

ITTM is a state of the art training centre of MTNL, Delhi engaged in imparting induction training and short duration training to its officers and employees in the field of Telecom, IT, Computer System and Management.

ITTM has the necessary infrastructure, technical and academic competence and excellence for providing training in specialized courses in the field of Switchng, Management, Transmission, Mobile Technologies, Broadband Technology, Computer System and various wellness and Life Style Management subjects comprising of Emotional Intelligence, Leadership Styles, Transactional Analysis, RTI, Labour Laws, Project Management, etc.

In addition to this, ITTM also conducts Industrial Training and visits from Engineering Colleges and Various Schools of India. From April 2022 to September 2022, total 219 internal trainees were trained in offline mode, 17 internal trainees were trained in E-Mode and 18 students were trained under industrial visit at ITTM.

- ii. Centre for Excellence in Telecom Technology and Management (CETTM), Mumbai:

The Centre for Excellence in Telecom Technology & Management (CETTM), an ISO 9001:2015 certified institute, is situated at Technology Street, Hiranandani Gardens, Powai, Mumbai.

CETTM successfully conducted in all 9 training programs (online via e-mode) and trained 77 in-house personnel achieving a figure of 77 Trainee days from Apr-2022 to Sep-2022. Total 755 number of Engineering/Polytechnic College Students from 15 different Colleges took part in the "Industrial Visit Programme" at CETTM so far in the year 2022-23. CETTM is suiting up to conduct classroom mode trainings with foreign ITEC batches from Jan-2023 subject to all the Government SOPs and guidelines time to time.

CETTM continues to be the first choice for conducting training courses, workshops, seminar etc. by our esteemed clients. Top clients include LIC, NPCIL, IITB, Informatis, Hare Krishna Movement, etc. Total Revenue of Rs.12.61 Cr has been achieved so far in the F.Y.2022-23.

CETTM also started leasing of its infrastructure on short duration basis for the shooting of web series, films by prominent production houses and generated substantial business. Further avenues of generating revenue through other production houses are under process.

5.3 ITI LIMITED (ITI)

5.3.1 INTRODUCTION

ITI Limited was established in 1948 as the first Government Departmental factory of independent India. Started with the vision of attaining self-reliance in the field of telecommunication needs of the country, the first manufacturing plant was set up at Bangalore. The Company was incorporated on 25-01-1950 under the Mysore Companies Act, 1938 and later converted into a PSU. The Government of India holds majority equity stake (Govt. of India – 90.06% & Govt. of Karnataka-0.03%) in the company. Over a period of time, the company widened its manufacturing base in the states of Jammu & Kashmir [Srinagar], Uttar Pradesh [Plants at Naini, Rae Bareli, Mankapur and Kerala [Palakkad]. ITI has provided livelihood to thousands of its employees, directly and indirectly, all over the country. Besides having a well-established infrastructure in its five manufacturing plants and one project execution unit spread across 4 States, ITI also has a strong Marketing set up through its 13 MSPs (Marketing, Services & Projects) set up. All the manufacturing Plants are accredited with ISO 9001-2015 and ISO 14001-2015 standards.

5.3.2 REVIVAL PACKAGE / PROJECTS

The revival package of Rs 4156.79 Crore (Rs1892.79 Crore as grant-in-aid and Rs 2264 Crore as Capex Fund in the form of equity) as approved by the Cabinet Committee on Economic Affairs (CCEA) in February 2014 for ITI Limited, has helped in the Company's turnaround. The entire grant-in-aid of Rs. 1892.79 Crore has been received out of Rs. 4156.79 Crore. Out of Rs. 2264 Crore ITI has received Rs. 1025.56 Crore of the Capex Fund. Capex Fund amounting to Rs 200 Crore has been allotted during FY 2022-23, out of which Rs 80 Crore has been released to ITI.

The Capex Fund has been invested for upgrading the manufacturing infrastructure at various Units of ITI to cater to the need of emerging technologies in the domain of Telecommunications, Electronics and ICT products, services & solutions. The State-of-the-art infrastructure established under revival package funds boosted the manufacturing strength to cater for domestic market demands under Make in India mission of Government of India. These projects have helped ITI Limited to regain its manufacturing strength.

5.3.3 HIGHLIGHTS OF PERFORMANCE DURING 2022-23

- i Financial Performance
 - a) ITI has achieved a Turnover of Rs. 474 Crore for half year ending 30.09.2022.
 - b) The order book position of ITI (Balance orders including APO) is Rs. 9491.58 Crore as on 30.11.2022.

ii. Major Highlights

- a) ITI Limited signed contract agreement with Indian Air Force for execution of OPS Applications Systems upgradation-HCI of worth Rs.414 Crore including AMC. CAPEX order worth Rs. 269.41 Crs has been executed. AMC worth Rs. 144 Crs for 5 years will commence after warranty period of 2 years.
- b) ITI has also received order worth Rs. 374 Crore (including AMC) from Indian Airforce for upgradation of 3G to 4G LTE. CAPEX order worth Rs. 233.89 Crs is under execution. Order worth Rs. 163.32 Crs has been executed as on 30.09.2022. AMC worth Rs. 144 Crs for 5 years will commence after warranty period of 2 years.
- c) ITI Limited has received a Letter of Intent (LOI) from Urban Development Department, Government of Maharashtra for the implementation of a centralized monitoring system based on information and communications technology (ICT) for solid waste management procedures in all urban local bodies of Maharashtra. The expected value of this contract is Rs. 400 Crore. This project will run for a period of seven years.
- d) Encryptor Product is the core / pioneer strength of R&D, ITI Limited. Company has completed Design, Development, Manufacture and Supply of various types of Encryptor i.e Multi-Capacity Encryptor Unit (MCEU), IP Encryptor, Terminal End Secrecy Device (TSED), Secure Fax, etc for various Defence and Govt. Sectors.
- e) It is of great pride for ITI Limited that ITI Palakkad Plant has been appreciated by ISRO for realizing the flight packages with respect to the launch of LVM3 M2/Oneweb India-1 Mission in a time bound manner meeting all ISRO/VSSC quality norms. ITI Palakkad was one of the major industry partner which VSSC is depending on for the realization of Avionic Packages. Various packages fabricated by ITI Palakkad have successfully flown in the LVM3 M2 Mission.
- f) ITI has expanded Data Center with 1000 rack more capacity. ITI Data Centre is MeitY empanelled cloud service provider & audited by Standardisation Testing and Quality Certification (STQC) for services including Government Community Cloud-(GCC) (Caged services), public cloud & private cloud. The Data Centre facility is Tier 3+ certified which ensures 99.982% availability all the time and concurrently maintainable. ITI Data center is CMMi level 3 certified, ISO certified under various categories viz. ISO9001, ISO20000, ISO 27001, ISO 27017 and ISO 27018.
- g) ITI has established two telecom-testing labs viz., EMI/EMC and Safety Labs for testing various parameters at ITI Bangalore plant in collaboration with TEC. NABL Accreditation is received for EMI/ EMC Lab. Also, EMC Lab has been designated as Conformity Assessment Body (CAB) by TEC, Delhi after successful completion of standards requirements with validity until 16.12.2024. MIL standard testing infrastructure upgradation is in progress.
- h) ITI Limited Palakkad has ventured into the field of manufacturing and marketing of

Laptop and have hosted two models namely ITIB14LI5 / ITIB15LI5 in the GEM portal. Both these models are duly certified by BIS, ROHS, CE and FCC.

- i) The Company has received a work order from Universal Service Obligation Fund (USOF) worth Rs.39.84 crore for execution of Pilot Projects for last mile Broad band connectivity in uncovered villages.
- j) ITI Limited Naini Plant has received LOI from Bangalore Electricity Supply Company Limited (BESCOM), for Design, Supply, erection, testing and commissioning Comprehensive Operation & Maintenance of Grid- Connected Roof Top Solar Plant of various capacities under the Phase-II of Grid Connected Roof Top Solar Scheme of MNRE in BESCOM jurisdiction under SOURA GRUHA YOJANE (SGY) of worth Rs.10.5 Crore.
- k) ITI Mankapur Unit has received a Purchase order from C-DoT for manufacture and supply of 40,000 Nos of Optical Network Termination (ONT 23) of worth Rs.7.22 crore.
- l) ITI Limited, Palakkad Plant received Purchase Order for Digitization of Tabulation Register from Kannur University of value worth Rs.1 Crore.
- m) ITI Limited, Palakkad Plant has received the Purchase Order from Kerala Infrastructure and Technology for Education (KITE) for supply of 6,600 Nos and 1883 Nos of ITI Make Laptop (ITI B15LI3) of worth Rs.22.12 Crore and Rs. 3.19 Crore respectively.
- n) ITI Naini Plant has received Lol from Bihar Renewable Energy Development Agency (BREDA) for supply of 50000 Nos. of Solar Street Light System for the total expected value of Rs. 150 Cr. Confirmed orders from 5 districts are received as on date.

S. No.	District Name	Qty in Nos	Total Amount in Rs Cr
1	Darbhanga	4120	12.64
2	Samastipur	4520	13.86
3	Siwan	3680	11.29
4	Gopalganj	3120	9.57
5	Purnia	3440	10.55
Total	18880	57.91	

- o) ITI Limited, Palakkad Plant has received a Purchase Order for Design, Supply, Installation, Testing and Commissioning of Digital School Solutions at Govt. Moyan Model Girl's Higher Secondary School from KSEDC Lol Value -Rs. 4.04 Crore.

- p) ITI Limited received a Purchase Order (PO) from BSNL for Technology Trial of Indigenous 4G and 5G RAN of worth Rs.1.90 Crore.
- q) ITI Limited, Naini has received a Letter of Empanelment (LOE) from MPPKVVCL, Jabalpur for implantation of 1.3 MW Roof top Solar Power Plant worth Rs.5.58 Core in Jabalpur.
- r) ITI Limited Palakkad Plant has received Purchase Order from KSEDC for Supply, Installation and Warranty Support of Hardware in 30 GH/TH INCLUDING 400 nos of ITI SMAASH PC across Kerala, of worth Rs. 1.88 Crore.
- s) ITI Limited Palakkad Plant received Purchase Order from University of Calicut for execution of E-Learning Studio and Digital Class Room of worth Rs.1.99 Crore.

iii. Production / Manufacturing & Service Highlights

- a) ITI had successfully completed the BSNL GSM project of around Rs.2940 Crore in various BSNL –South Zone Circles namely - AP, Telangana, Chennai, Karnataka, Kerala and Tamil Nadu Circle along with mandatory AMC. Later BSNL has extended the AMC upto Dec 2021 and further extended AMC order worth Rs 70 Crore for one more year upto Dec 2022.
- b) ITI Limited- Naini Plant has manufactured 19166 nos of SPV module of 325Wp for establishing solar power plant project for captive use at ITI units at Raebareli (1.5 MW capacity), Naini (300 KW), MSP – Lucknow (100 KW), Palakkad (1.2 MW), Bangalore (1.2 MW), Mankapur (1.5 MW) and Corporate office (100 KW), to make savings in electricity bill to the extent of 30%. The Plant has also manufactured 20000 nos of 60 watt SPV Panel for MahalT project. 4500 Nos of 60W SPV has been supplied to BBNL in June 2022.
- c) The component screening and testing facility at ITI – ITI Palakkad Plant is associated with Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram in realization of electronic packages for various launch vehicles as well as screening of electronic components/ Packages. The association started with the establishment of Space Electronics Fabrication Centre (SEFC) at ITI Palakkad for electronic assembly for Space Application in the year 2010 and expanded over a decade in to wide range of activities. The centre is approved for the realization of various Electronic Packages used in launch vehicles which include operations such as SMD Assembly & Manual Assembly, Conformal Coating, Card level testing, Integration, Integration testing, In line QC, Screening of Components, Test & Evaluation (T&E) of assemblies and multi stacks. Customized test jigs, Burn-in boards, Vibration fixtures and software programs are developed in-house for each assembly/components individually, meeting all the critical parameters identified by VSSC, for completion of item wise qualification procedures. ITI Palakkad is the only work centre accredited by VSSC for RF Package Assembly and Testing.

ITI Palakkad is having business association with 3 units of ISRO namely VSSC

(Vikram Sarabhai Space Centre), LPSC (Liquid Propulsion System Centre) and MVIT (Mechanisms and Vehicle Integration Testing) all of which are located at Thiruvananthapuram and are engaged in the Manufacturing, Testing and Integration of all Launch Vehicles - PSLV, GSLV, GSLV Mark III etc. used in various space missions of ISRO. More than 1 Lakh electronic components / assemblies are screened from this centre and more than 2500 flight packages manufactured by ITI are successfully flown in various launch vehicles of ISRO including the prestigious Chandrayan Mission. The GSLV Mark III launched on 23rd October 2022 with 36 satellites on board and which successfully placed all these satellites in the right orbits with extreme precision in LVM 3 M2/One Web Indian-1 Mission had on board a total of 47 packages executed by ITI Palakkad Plant and our valuable contribution in the mission has been acknowledged and appreciated by ISRO.

Our work centre has now been approved for the prestigious man mission of ISRO - Gaganyaan – and we have already started working on these packages. Our Component Screening Facility has recently been accredited for screening of discreet components as well. All these have proudly placed ITI Limited prominently in the National Space Missions of our country.

- d) ITI has been the leader in supplying MLLN products and services, including turnkey solutions for supply, installation, integration, commissioning, operation and maintenance of Network Equipment to BSNL since 2002-03. The existing MLLN networks has been installed and maintained by ITI till date. ITI Palakkad has executed worth Rs 18.86 Crore BSNL/MTNL AMC orders of MLLN during FY 2021-22. 24 x 7 technical support is being extended by ITI to MLLN projects for BSNL and MTNL.
- e) ITI has developed branded Laptops “ITI SMAASH” and the product has acquired all the statutory certifications such as BIS, FCC, RoHS, CE, BEE etc. and is registered in GeM. The product is available in various configurations such as Celeron, Core i3, Core i5, Core i7 etc. ITI is having the MoU partnership with Intel as the technical advisor to identify the business requirements and including enabling ITI branded laptop portfolio for India market. The business segments targeted are Education sector and Government organizations. We have won 2 tenders of Kerala Infrastructure and Technology for Education (KITE), Kerala for the supply of 8483 nos of Laptops for the various Govt. schools in the state. The business will be around Rs 25.30 Crs and target to execute in the current FY year itself. ITI Palakkad has supplied approximately 11000 nos. of SMAASH PCs to various customers such as E-health Kerala, AIR India, Various Universities, Govt. and Private Institutions etc.
- f) HDPE Duct: 7 HDPE Duct manufacturing lines are established at Rae Bareli, 3 lines in Mankapur and 2 each in Palakkad & Bangalore with annual capacity has been enhanced to 56,000 Kms with this ITI has manufactured and supplied 10,400 Kms HDPE Duct for Mahanet project, 433 Kms for Andaman & Nicobar project and 1850 Kms for TANFINET project under Bharatnet. Further, 11,000 kms of Duct has been manufactured for ASCON Phase IV project. Recently private sector T.S.P Vodafone placed PO of 150 Km with ITI Rae Bareli.

- g) **OFC:** Optical Fibre Cable (OFC) manufacturing lines are established with an annual capacity of 30,000 KMs at Raebareli plant. ITI is executing order received from ASCON (11,300 Kms) and TANFINET (8997 Kms) and Railway orders.
- h) ITI Palakkad unit is having the state of the art infrastructure for the manufacturing of Smart energy meters as per the Advance Metering Infrastructure (AMI) requirements. The unit has received type approval and BIS certification for Single Phase Smart Energy meters. Palakkad Unit has manufactured and supplied Smart energy meters to various DISCOMs in UP and Haryana against the order from EESL.

iv Project Highlights

- a) **ASCON Phase IV Project:** The Company has signed contract with Ministry of Defence for execution of the mega order of Army Static Switched Communication Network (ASCON) Phase IV project worth Rs 7,796.39 crore (CAPEX & OPEX). It includes Installation, commissioning and maintenance of telecom equipment, NMS, mobile nodes and civil works for providing the complete infrastructure at various sites and roll out of optical fiber network. The project covers IP MPLS-based communication network with microwave radio & satellite spread across northern, north-eastern and western regions. The implementation of the project is to be completed in three years and thereafter it has to be maintained for ten years including two years warranty. For this project requirement the HDPE Duct, OFC, FDMS, RoHS Complied Racks, etc are manufacturing at various units of ITI. PoC activities like test bed establishment, IPMPLS, Microwave equipment, Servers delivery, WPC clearance and functional testing of equipments are under progress. Under project Rollout, survey work on OFC, Equipment Nodes, Microwave and civil construction are under progress. ITI manufactured OFC and Duct are being used under this project. As on 30.09.2022, executed Rs. 1010.26 Crs order.
- b) ITI has also received Purchase order worth Rs. 39.82 crore against Rollout of Airtel FTTH connection in Eight Circles including FF-OFC laying, Trenching & digging work for NLD back Bone. As on 30.09.2022, executed Rs. 9.82 Crs order.
- c) **AMC for ASCON (Phase-I, II & III):** ITI through its Network System Unit provides Annual Maintenance Contract services to all phases (Phase-I, II, & III) of Army Static Switched Network (ASCON) of Defence. ASCON Network is secured using Bulk Encryption. It uses state-of-the art ATM (Asynchronous Transfer Mode) and ISDN (Integrated Services Digital Network) switches, Satellite media, PAMA (Permanently Assigned Multiple Access) and DAMA (Demand Assigned Multiple Access), Microwave Radio, PDH, SDH and Optical Fiber communication (OFC) Network PAN India. ITI maintain OFC route of Army defence network for a total length of 5000Km. ASCON AMC service has been maintained by ITI till Nov 2022.

v. BharatNet Ph. II project

- a) **Gujarat Net Project:** ITI is executing a turnkey project for provisioning of broadband solution across Gujarat State. The project consists of laying of approx. 18,212 KMs

of OFC, supply of DWDM (Dense Wave Division Multiplexing) equipment, optical transmission and access equipment and to provide connectivity to 4228 Gram panchayats to enable around 2 Crore rural population to avail the Broadband connectivity and establishment of network comprising DWDM network, L3 switches, Fibre monitoring system, Data Centre and network operating Centre (NOC). The Project value is approx. Rs. 1210 Crore. As on 23-12-2022 liting of 4220 GPs have been completed, out of the balance 8 GPs: 4 are under forest permission, 3 under road widening and 1 is under legal dispute. ITI has supplied in house manufactured 223 OLT & 4228 ONTs to GFGNL (GujNet) as on date. As on date a total amount of Rs1157 Crore has been invoiced against the P.O. value of Rs 1210 Crore.

- b) MahaNet Project: ITI is executing a turnkey project for provisioning of broadband connectivity across Maharashtra State. This project includes laying of 19,672 Kms Underground (UG) and 17,841 Km Aerial (OH) OFC, Establishment, Commissioning and Maintenance of Network comprising of IPMPLS (IP Multi-Protocol Label Switching) Routers, Switches, Solar equipment, Microwave radio, Wi-Fi hotspots and Network Operating Centre (NOC). The Total Project value is around Rs. 2936 Crore. As of now T&D work of 18,250 km and aerial OFC laying of around 14,369 Km length have been completed. ITI has executed the project with total value of Rs. 2747.13 Crore. Out of this, turnover of Rs 1367.46 Crore is achieved in FY 2020-21, Rs. 283.51 Crore in FY 2021-22 and Rs. 50.92 Crore during FY 2022-23 as on 30.09.2022.
- c) TanfiNet Project: ITI is executing a turnkey project for provisioning of broadband connectivity across Tamil Nadu State. This project includes laying of 1838 Km Underground (UG) and 12,098 Km Aerial (OH) OFC. The total Project value is around Rs. 433 Crore. As of now T&D work of 653 km and aerial OFC laying of around 2626 Km length have been completed. As on date 30.09.2022, total order value of around Rs 34 Crore has been executed against this project.
- d) Andaman & Nicobar Project: Further, ITI has received order worth Rs. 37.27 Crore from BBNL for implementation of BharatNet Phase-II project including supply, installation, testing and commissioning of OFC (underground & Aerial), GPoN Network and Radio Network as well as O&M (operation & maintenance) across the Union Territories of Andaman & Nicobar.
- e) TPA (Third Party Audit) in Jharkhand and Odisha

Under BharatNet Phase-II, BBNL (Bharat Broadband Network Ltd.) has assigned the Project for 11 Districts (118 Blocks/ 1684 GPs) of Jharkhand to JCNL (Jharkhand Communication Network Ltd.). ITI is working as Third Party Auditor (TPA) –Tier I in this project valued at Rs. 3.53 Crore. ITI is also working as TPA-Tier I for Work Order valued at Rs. 8.82 Crore for 30 districts (264 Blocks/2983GPs) of Odisha received from OPTCL (Odisha Power Transmission Corporation Limited). Cumulative Revenue of Rs.9.05 Crore has been generated through these projects for FY 2020-21, Rs. 6.54 Crore has been achieved for FY 2021-22 and Rs. 0.89 Crore during FY 2022-23 as on 30.09.2022.

- f) TPA (Third Party Audit) for Satellite based Broadband equipment and Solar Power Plant

ITI has received an order from BBNL worth Rs.11.64 Crs for TPA activities for Acceptance and testing of Satellite based Broadband equipment and Solar Power Plant at 4849 GP sites across 15 states/union territories. Revenue of Rs. 2.19 Crore has been generated through this project in FY 2020-21 and Rs.2.64 Crore has been achieved for FY 2021-22 Rs. 1.88 Crore during FY 2022-23 as on 30.09.2022.

- vi Network For Spectrum (NFS)

Prestigious NFS Project for Package G & F for Construction of Exclusive Optical NLD Backbone and Optical Access route on turnkey basis for Defense network being executed by ITI Raebareli and Mankpaur has booked a turnover of Rs.108.95 Crore during FY 2020-21, Rs. 104.88 Crore for FY 2021-22 and Rs. 13.86 Crore during FY 2022-23.

- vii USOF Pilot Projects

Four proposals from Start Ups on 4G LTE and E-Band Radio were submitted through ITI Limited and approved by USOF against the scheme ref: 30-40/2018/BharatNet/ PilotScheme /USOF dated 02-03-2020 to support Small and Medium Enterprises (SME's) pilot projects towards utilization of BharatNet network through their innovative technologies. PoC of all four technologies in two sites for each technology were successfully conducted in the first week of Oct.2022. The PoC in the balance sites is under progress.

- viii BSNL Turnkey 4G Project

As part of its focus on delivering turnkey projects, in the field of Telecom, IT and networking ITI Limited has decided to contribute in the proliferation of indigenously manufactured 4G Mobile equipment and service in the Indian Telecom Space through BSNL's 4G Tender under Atma Nirbhar Bharat Mission along with Technology Partner TCS. ITI has submitted the Bid against the BSNL Turnkey 4G Project for Reservation Quota Order. Technology transfer for manufacturing of 4G Remote Radio Unit(RRU) is under progress in ITI. ITI has upgraded its manufacturing infrastructure and has initiated for procurement of Test Instruments for 4G RRUs.

- ix Manufacturing of C-DOT 4G LTE RAN

ITI has received Purchase order for Technological trials of indigenous 4G and 5G RAN from BSNL and the PoC is under progress. ITI has entered into Transfer of Technology with C-DOT for manufacturing of 4G LTE RAN to be deployed for BSNL network The first proto types will be ready by 31st Dec 2022(Band 28). 20 Sites for PoC have been allocated by BSNL. Component procurement is under progress for making prototypes of 150 systems of Bands (B1, B3, B5, B8, B28, B41).

- x R&D activities for development of new products

Research & Development (R&D) located in Bangalore plant is designing & developing

Communication Equipment to support manufacturing and keep abreast of State of the Art Technologies in the field of Electronics & Communications. R&D has core strength in design & development of Encryption systems to secure Communication Networks and also in development of Network solutions. The necessary infrastructure to aid design & development is available in the form of Test Instruments, Software design tools, CAD design tools, Reliability lab, EMI/EMC test lab and Telecom testing lab.

In Financial year **2022-23**, the development of products like Digital Mobile Radio (DMR), crypto products, Multi Post EVM, Smart Energy Meter, Power supply modules, Spare algorithms for various crypto products Like NGN/Flexi BEU, TESD/SESD, 1GE IP Encryptor and SAG evaluation etc are in progress in R&D, Bangalore.

The following products development is initiated:

- a) SDR (Software defined Radio)
- b) FCE (Field Cipher Equipment) MK II for Army
- c) VHP (Versatile Hardware Platform) for CAIR
- d) E1 Encryptor for Eastern Command (Army)

Demo of 1GE Encryptor are being conducted with BSF, ITBP and DCPW for perusing the order from these customers.

xi Multi Service Platform/Security Operation Centre(SOC)

ITI has entered into an MOU with Tata Communications for setting up of Multiservice Platform/ Security Operation Centre (SOC) in ITI Data centre in Bangalore. Various IT and security services like Identity Access Management, Email Security, Data Loss Prevention, Distributed Denial of Service (DDOS) Mitigation, Network Access Control, Endpoint Protection, Detection & Remediation, SIEM (Security Incident and Event Management) and Threat Intelligence & Advisory would be provided to various clients to fulfil their network security requirements. Implementation of Multiservice Platform/Security Operation Centre (SOC) is completed and ready to provide services to customers.

xii Future Prospects

To supplement country's requirement of self-reliance in the area of Telecommunication, recently ITI has entered into an MoU with various technology partners.

- a) ITI has revised its PLI application by including more products like RRU, GPON OLT, ONT, Router, Wi-Fi Products etc. with an investment of 120 Cr between the periods 2022 to 2026.
- b) ITI signed a ToT and MoU with C-DOT for transfer of technology of 4G LTE RAN.
- c) ITI has signed the ToT agreement with VSSC/ISRO Trivandrum for the Manufacturing of portable Medical Oxygen Concentrator (called Shwaas).

- d) ITI has signed ToT with C-DOT for latest version of Wi-Fi Access Points like Wi-Fi 6 Indoor Access Point, Wi-Fi 6 Outdoor Access Point, Dual Band outdoor Access Point (DOA-1200), Wi-Fi 5 (802.11ac) Gigabit Router (WGR-1200), Enterprise Access Point (EAP) Outdoor (Wi-Fi- 5 EAP).
- e) ITI has signed a MoU with M/s Telecommunications Consultants India Limited (TCIL) on 23rd Nov 2022 for addressing the opportunities in India as well as abroad for the ITI products and Services and to address new tender opportunities.
- f) Partnering with technology companies and start-ups to offer various types of products and solutions. In particular focus is on products including smart metering, smart health, smart environment, smart surveillance, smart agriculture, intelligent transport, smart e-governance etc. with intention to manufacture various IoT products using the state-of-the-art infrastructure that has been set up under the revival plan.
- g) ITI has signed a TOT agreement for “Single Outlet Automated Resuscitator (SOAR)” with Defence Bio-Engineering and Electromedical Laboratory (DEBEL), a constituent laboratory under the Defence Research and Development Organisation (DRDO). The TOT is for manufacture and sale in India for Covid19 purpose & supply to Indian Armed forces, paramilitary and civilian customers (Govt Hospitals) within India for Covid19 purpose. It has successfully undergone trial test in RR Hospital, Delhi and approval letter is awaited. ITI has received the registration number from CDSCO for ventilator and in the process of applying for ISO 13485.

xiii Performance of MSP (Marketing, Services & Projects)

ITI has 13 offices throughout India managing marketing services and project execution. ITI MSPs are doing Telecom, IT, IOT, e-Tendering, Smart Class, Geo Fencing & Manpower Tracking, GIS based mapping, CCTV surveillance and allied business for various State and central Govt. departments. MSPs have achieved a turnover of Rs. 242.74 Crs as on 15.12.2022 during FY 2022-23. Tenders have been addressed against various projects such as Railtel IP Based Video Surveillance Systems for 8 regions, NHAIFC project, BSNL 4G, BSNL OFC procurement, BSNL tender for supply of OLT and ONT etc. ITI has received order worth Rs. 29 Cr for supply of OLT during this financial year.

xiv Performance of Srinagar Plant

ITI Srinagar Plant has signed an MoU agreement with the Skill Training Partner (M/s Comtech Institute of Technology) to conduct the Skill based training programs at the ITI Skill Development Centre of Srinagar Plant. The Unit has recently established the Optical Fibre Cable Laying Training Centre i.e. one of the first and unique Optical Fibre Training Centre in whole UT of Jammu & Kashmir. The ITI Srinagar Plant has already started the training classes related to Optical Fibre. Moreover, the Srinagar Plant has also participated in the Tender of five-year Comprehensive Maintenance Contract (CMC) of Solar Street Lighting Systems for various district/departments of UT of J&K of JAKEDA (Jammu & Kashmir Energy Development Agency). Upon award of above project of JAKEDA the coordination of activities will be initiated at Srinagar unit.

5.3.4 Details of achievements for the last three years

(Value in Rs. Crore)

Sl. No	Product/ Project	Performance 2020-21 (Audited)	Performance 2021-22 (Audited)	Performance 2022-23 (Up to 30.09.2022)
1	NFS cable laying	108.95	104.88	13.86
2	Corp Mktg & MSP	287.84	744.24	157.11
3	Defence AMC/ASCON(MoD) AMC	79.25	24.47	6.57
4	MLLN, MLLN AMC /SSTP	22.03	18.86	9.21
5	GSM-SZ / AMC	34.38	98.42	18.72
6	NGNAMC	4.03	3.94	1.90
7	OCB AMC Business	8.65	3.70	0.14
8	G-PON ONT/OLT/TitliONT/I&C	1.28	8.62	4.92
9	Defence Business/MCEU/MHA IP Encryptor	86.12	9.93	
10	Data Centre	17.98	20.41	10.29
11	Banking /Div. Prod. /cont. Mfg./Srinagar services/ TPA/SNVM/ SNDM/3D printing/ Smart Parcel delivery system/ Turnkey projects/GSM Franchisee/ Railway turnkey project	17.52	17.32	4.99
12	SMPS & Repair	7.80	19.92	8.86
13	HDPE /OFC	35.67	5.50	4.93
14	SATCOM & PCM MUX, C-DOT AN RAX.		1.20	0.08
15	Solar Panel Mfg./LED Street Lighting	12.28	29.98	1.35
16	GujNet (including O&M)	114.58	63.08	41.52
17	MahaNet	1367.46	283.51	50.92
18	Wi-Fi Hotspot	0.43	0.58	
19	Micro PC/ Comp Screening/ E-governance/ Aadhar Business/ Smart Card	16.18	12.64	11.34
20	Face Shield	3.21	0.09	
21	ASCON PH-IV	328.40	599.57	82.67

22	Airtel FTTH Rollout		5.97	2.69
23	BharatNet Andaman & Nicobar	23.86	0.67	
24	Tanfinet			33.98
25	USOF			7.97
	TOTAL	2577.90	2077.48	474.03

Note: The performance includes Taxes

5.3.5 Capital Structure

The Authorized Share Capital of the Company as on 30th November, 2022 was Rs.3500 Crore (Rs. 2800 Crore for Equity and Rs. 700 Crore for Preference shares) The paid-up Share Capital as on that date was Rs.949.58 Crore (94.96 Crore equity shares of Rs.10/- each). The percentage share of Government of India in equity as on 30th November, 2022 is 90.14%.

5.3.6 Financial Performance

(Rs in Crore)

Performance During the Years (Rs in Crore)				
Particulars	FY 2021-22	FY 2020-21	FY 2019-20	FY 2018-19
Revenue from Operation (Gross)	2077.48	2577.89	2403.45	1894.04
Less: GST	216.75	215.71	344.58	225.67
Revenue from Operation(Net)	1860.73	2362.18	2058.87	1668.37
Other income	254.57	161.37	183.89	336.47
Total Income (A)	2115.30	2523.55	2242.76	2004.84
Expenditure (B)	1994.24	2512.35	2095.28	1912.30
Net Profit/Loss (A-B)	121.06	11.20	147.48	92.54

Total equity shareholding of the company as on 30-11-2022

SI No	Category	Number of shares	Amount in Rs.
1	Equity share (Face value of Rs.10 each)	94,95,77,352	9,49,57,73,520
	Total	94,95,77,352	9,49,57,73,520

Breakup of equity shareholding pattern as on 25-11-2022

Category of shareholder	No. of fully paid up equity shares held	Shareholding as a % of total no. of shares
Promoters		
President of India	85,59,12,566	90.14
Government of Karnataka	3,12,500	00.03
Sub-total promoters shareholding	85,62,25,066	90.17
Public		
Institutions	8,25,013	0.09
Special National Investment Fund(SNIF)	7,31,32,976	7.70
Non-institutions	1,93,94,297	2.04
Sub-total public shareholding	9,33,52,286	9.83
Total	94,95,77,352	100.00

5.4 Telecommunications Consultants India Limited (TCIL)**5.4.1 Introduction**

Telecommunications Consultants India Ltd.(TCIL) is a Mini Ratna Category-I Schedule-'A' company, 100% owned by Govt. of India Undertaking providing consultancy, implementation services and turnkey project execution services in the field of Telecommunications, IT, Power, Civil & Architecture. Incepted in 1978, TCIL introduced new technologies in telecom software, switching and transmission systems, cellular services, rural telecommunications, optical fiber-based backbone transmission system, etc. TCIL is an ISO 9001:2015 CMMI Level-3 certified profit making Indian MNC that has been undertaking various projects across diverse fields of telecommunications and information technology in over 85 countries across the globe.

TCIL's core business is creating connections through communication with a vision to excel in providing solutions in Information and Communication Technology, Power and Infrastructure Sectors globally by anticipating opportunities in technology. Under the PAN Africa Network Project, TCIL is providing Tele Education and Tele Medicine services to African nations connecting African universities and hospitals with Indian universities/institutes and super specialty hospitals. Additionally, TCIL offers services from concept to commissioning in setting up Smartcities, Homeland security and Integrated Security Projects. The ICT@Schools program is the largest Govt. funded digital literacy program bringing digital skills to as many as 2.5 million young students in semi urban and rural areas. School project in Uttarakhand is of prime importance as it is satellite-based and provides interactive modal of education simulating real-time scenario.

TCIL has been a pioneer in setting up projects using new technology & applications in rural markets and in remote areas with geographically difficult terrain such as Arunachal Pradesh, J&K and others, offering value added service through empanelment of Start-ups, MSEs and Business Associates. The TCIL has constructed a first-of-its-kind REC World Headquarter Building at Gurugram, designed to GRIHA-5 star ratings and equipped with Access controlled Lighting Management system, 100% solid waste management and rainwater harvesting system. A profit making PSU (Public Sector Undertaking), TCIL is constantly trying to improve the lives of people in India through its various operations across the globe.

5.4.2 Industrial/ Business Operations:

Under its recent lateral diversification and expansion strategy, TCIL has expanded its service portfolio to provide full scale project consultancy, execution and implementation in the following areas:

- i Wired Line Projects - Optical Fiber Network, FTTH, OPGW, Submarine cable.
- ii Wireless Projects - TETRA, Mobile Technologies, In-Building solutions, QoS Audits, SatCom/VSAT Networks.
- iii Tele-education and Tele-Medicine Networks- e-Vidya Bharati and e-Aarogya Bharati.
- iv E-Governance Projects for Government-to-Citizen (G2C), Government-to-Business (G2B), Government-to-Government (G2G).
- v OPGW Power Sector Projects/RDSS/Smart Metering
- vi Health Sector Projects such as Ambulance Management, HIMS, ERS (Emergency Response System).
- vii ICT@School Projects for several states.
- viii Security and Surveillance, Data Centre, Broadband Networks Disaster Management, IPV6, Statewide Area Network (SWAN), Managed Services e-Procurement and Video Conferencing.
- ix Cyber Parks, Buildings - Intelligent Buildings and Green Building System and Roads.
- x Integrated Check Gates Projects.
- xi Internet of Things (IoT), Services on Fiber, Artificial Intelligence (AI).
- xii Skill Development.
- xiii Data Security and Cyber Security.
- xiv Smart Cities and Experience Centers across India.

5.4.3 Performance Highlights:

TCIL achieved total revenue of Rs. 1595.70Crores during FY 2021-22. The profit after tax was Rs.

30.33Crores. The company has achieved Provisional turnover of Rs. 964.03Crores up to September 2022for FY 2022-23. Order booking for FY 2022-23is Rs. 998.08 Crores up to September 2022.

- i e-VBAB- TCIL has been designated as the implementing agency for the e-VBAB project of Ministry of External Affairs (MEA) Govt. of India, providing Education & Healthcare Services to African Countries. Till date 22 countries have signed the agreement for service delivery under the e-VBAB project. TCIL has signed agreement with 27 Higher Education Institutes (HEIs) approved by UGC to provide Online programmes/courses. The Tele-Education services are available on www.ilearn.gov.in which is an administrative portal for approving the scholarship applications of learners and monitoring of their academic progress.
- ii ICT Virtual Classroom Projects - TCIL has installed State of Art Virtual and SmartClassroom to provide superior products to enhance the level of learning in Schools/ Colleges/Institutes under Ministry of Human Resource Development and Sarva Shiksha Abhiyan for various states including Odisha, Bihar, Andhra Pradesh, Telangana, etc TCIL provides innovative interactive solutions for various Government Schools, Universities and Institutions which includes hardware such as Interactive products as well as software solutions.

Major projects are mentioned below:

- a) Setting up of 2464 Smart Classrooms in 1232 schools across Bihar
 - b) Supply, Installation & Commissioning of 1173 Smart Classrooms for 99 schools under Navodaya Vidyalaya Samiti.
 - c) Setting up of 40 Math Labs in 40 Govt. School A&N Islands
 - d) Supply, Installation, Commissioning and Warranty support of around 755 Digital Classrooms and 1430 Math Labs in Keonjhar District, Odisha.
 - e) Digital Virtual Collaboration Solution (Video Conferencing) at 34 locations of Kendriya Vidyalaya Sangathan (KVS) across India.
- iii Telangana Fiber Grid Project(T-FIBER) - The project is envisaged to provide Telecom infrastructure to support high-speed broadband connectivity and digital services in 10 Zones (33 Districts) of Telangana state. The network shall be capable of delivering 4-100 Mbps to households and 20-100 Mbps to Govt. Institutions and Enterprises. It is planned to have a 100G Multi-Protocol Label Switching (MPLS) ring connecting Zones, 40G MPLS ring at Mandal (Block) Level & 10G MPLS ring at Gram Panchayat (GP) level.
 - iv VSAT - TCIL has been awarded a Turnkey project by Bharat Broadband Network Limited (BBNL) for Supply, Installation, Testing, Commissioning, CAMC of Gateway Baseband equipment and VSAT equipment for satellite based communication network. The project will provide backhaul connectivity to 5521 remote sites consisting of Gram Panchayats locations (4112) and DSPTs locations (1409) of MHA/MOD

agencies spread across 24 states, under Bharat Net Project Phase-II including Operation of Gateways. Internet service is being provided through VSATs to Panchayat offices, Govt. schools, and health centers etc, which are located at very remote areas and to the Border Outposts of Armed Forces. The order value is Rs 256.69 Crores.

- v BSNL CDR PROJECT - Currently the Operations Support System and Business Support System for fixed line Telecom and IP-based services of BSNL are being served by three projects namely:
 - a) CDR Project-I (South DC at Hyderabad and East DC at Kolkata)
 - b) CDR Project-II (North DC at Chandigarh and West DC at Pune)
 - c) NIB-III Project-3 (Main DC at Bangalore, DR at Pune, Branch DC's at Mumbai & Noida)
- vi Country-wide Optical Fiber Network Project for Defence- TCIL has executed "Network for Spectrum" Project of BSNL which was designed for the Exclusive Network of Defense Services in the state of Rajasthan, Uttarakhand and Uttar Pradesh worth Rs. 2000Crores. The scope of work included the Survey, Design, Construction and Testing of exclusive optical NLD backbone & access routes network for Defense Services, followed by 3-Year warranty and 7-year AMC. The project involves supply of material and laying of more than 10000 kms of Optical Fiber Cable through Permanent Lubricated Ducts. More than 99% links have already been commissioned along with completion of warranty for part of the project. AMC of 7 years is in progress now.
- vii GIS based OFC Network for Indian Navy -BSNL has awarded the construction work of OFC Network for the exclusive use of the Indian Navy, Ministry of Defense (MOD) for a value of Rs. 555.82 Crores inclusive of all taxes on 22nd July 2015. The network uses state-of-the-art technology to ensure completely secured network to Indian Navy. Project Scope involves Supply of 96F (Ribbon)/48F+8F/ (Sensory Fiber) Intrusion Proof cable.
- viii CCTV Surveillance Project –TCIL has won CCTV surveillance project for MP Police, Rajasthan Police, Patna High Court, Jammu & Kashmir Safe City Projects. Scope of work includes CCTV surveillance for various police stations of state and associated components such as networking passive cables, recording devices, UPS, storage etc.
- ix IPCC TV for DTC Buses – TCIL has been awarded a work order for Rs.160.7 Crores for Design, Implementation and Management of IP CCTV and Automatic Vehicle Tracking System in DTC and Cluster Scheme Buses from Transport Department and Delhi Transport Corporation. The project envisages implementation of surveillance system through video surveillance and automatic vehicle tracking system in accordance with the highest standards available for monitoring the activities of

the commuters using the DTC and Cluster buses and the crew members.

The project has the following major components:

- a) IP CCTV Surveillance system in side 5500 Buses. Inside all buses, three (3) IP CCTV Cameras, one (1)7"Display, one(1)m NVR with housing & storage, ten(10) Panic Buttons, one (1) hooter, one (1) Strobe, two (2)Audio console.
 - b) MPLS Cloud Network to connect 5500buses, 66depots,1 Viewing Centre,1Data Centre, 1 Command and Control Centre, 1 Disaster recovery
 - c) Full-fledged Command and Control Centre at ISBT Kashmere Gate.
 - d) Viewing Centre at Transport Department Headquarter, Disaster recovery at Sarai Kale Khan ISBT.
- x DARPAN (Postal Project) -TCIL is executing a Rural ICT-Hardware (RH) project for Department of Posts, Ministry of Communications, for Supply, Installation & Maintenance Services of Hardware, Peripheral Devices, Operating System and Connectivity. The project is being executed in consortium with M/s Minosha India Limited (erstwhile RICOH India Limited) on a lease model of Build Own & Transfer (BOT) basis. The objective of the Rural ICT project is to provide low power technology solution (ICT Devices) to each Branch Postmaster (BPM), which will enable each of approximately 130,000 Extra Departmental Post Offices (EDO's) to improve the quality of service, add value to the service and achieve "financial inclusion" of un-banked rural population while taking advantage of the opportunity to increase revenue traffic. The total value of the project is Rs. 1368.12 Crores.
- xi APSFL Project - Govt. of AP set-up a State Govt. owned enterprise (SPV) APSFL (Andhra Pradesh State FiberNet Ltd.) for implementation of Bharat Net Phase-II in 13 districts of AP. APSFL divided the OFC backbone work into 3-packages viz., Package-A, B, C and invited open bids in 2018-19. TCIL bagged Package-A over 5-districts at total value of Rs. 479.29 Crores. MSA was signed on 8th Jan 2019. Later APSFL awarded LOI on 07.02.2022 for Package-C, covering another 4 districts for a total value of 260.51 crore. The work involves establishing Optical Fibre Network Infrastructure using 24F ADSS cable in the five districts of package-A (Guntur, Krishna, Kurnool, Prakasam, West Godavari) & four districts of Package-C (Srikakulam, Vizianagaram, Visakhapatnam and East Godavari).
- xii Meghalaya Mining Truck scanning and Monitoring System(MMTSMS) – TCIL is implementing work of 18 Integrated check gates alongwith integrated command and control center for monitoring of Mineral/ Non – Mineral loaded trucks for Department of Mining & Geology, Government of Meghalaya. The Project has been awarded to TCIL as Project Implementation Agency. Presently around 80 Crores of work has been completed.
- xiii 104JE & 108 ERS Call Center Rajasthan – TCIL has been awarded the work for

Operation and Maintenance of 104 Janani Express & 108 Emergency call center for Rajasthan for Rajasthan by National Health Mission, Department of Health and Family Welfare, Government of Rajasthan. The Scope of work includes operation and maintenance of 100 seater 24hrs 7 Days call center and third party Audit of Ambulances for Rajasthan.

- xiv OPGW Projects- TCIL is presently executing OPGW Projects in Jammu & Kashmir, North East Region and Uttar Pradesh. Total length of OPGW in these projects is 3500+ Kms. Scope of Work includes stringing of OPGW cable on High voltage transmission lines 132KV, 220KV, 400KV and 765KV in Live Line conditions.
- xv Telecom Consultancy - The Telecom Consultancy Projects undertaken by TCIL during the year include:
- a) Consultancy for last-mile connectivity and Early Warning Dissemination Solution for the states of Goa, Maharashtra, Karnataka and Kerala under NCRMP II (Client – SPIU's of the respective states) amounting to Rs. 5 crore (Approx). The above consultancies that were awarded to TCIL in 2018 are under successful execution. TCIL has completed the solution design, tender preparation, floating and evaluation works. For Goa, Maharashtra, Karnataka and Kerala states the implementation work has already been awarded to the implementing agencies.
 - b) Technical Consultant- KLI EIA for Submarine OFC Connectivity between Mainland India (Kochi) and Lakshadweep Island (KLI Project) for USOF amounting to Rs. 4.05 Crore (Approx). Scope of Work comprises of Appointing agency for of Environment Impact Assessment (EIA), Selection of Independent Monitoring Agency (IMA), Co-ordination with concerned Ministries / UT Administration / Governmental bodies for security statutory permission, Vetting of Drawing Prepared by BSNL for housing of equipment of Dry Plant for installation of CLSs, Assist in Forming draft USOF Agreements.
 - c) Hiring of Independent Monitoring Agency (IMA) for Kochi and Lakshadweep Island (KLI Project) for USOF amounting to RS 6.35 Crore (Approx.) Scope of Work comprises of Completion of the Marine & Site survey, Quality Assurance Verification, Factory Acceptance Testing (FAT) & System Assembly Test (SAT), Marine Installation, CLS & Other Infrastructure Readiness/Completion, Installation & In station Testing and Acceptance testing & system commissioning.
 - d) Hiring of NIO for monitoring of damages to corals during laying of submarine optical fiber cable connecting Kochi to 11 islands of Lakshadweep (KLI Project) amounting to Rs. 60 Lakh. The project is funded by USOF.
 - e) Third Party Audit for BharatNet II Project of Gujarat State (Client – GFGNL) amounting to Rs. 65 Crore(Approx.) TCIL has been carrying out the audit

related activities for this Project. A 200+ team of engineers is deployed in the field to cover 22 districts of Gujarat. The Project has been completed.

- f) Third Part Audit for BharatNet II Project of Maharashtra State (Client – MahaIT) amounting to Rs. 30 Crore (Approx.) Similar to Gujarat, TCIL has been carrying out the audit activities in Maharashtra also with 80+ engineers deployed in the field.
 - g) Third Party Audit for KFON PMA for Kerala State amounting to Rs. 19.98 Crore (Approx.) TCIL has been awarded TPA works for Kerala BharatNet II Projects. Agreement with KSITIL was signed in December 2019. A 30+ member strong team is deputed already in the field by TCIL.
 - h) Establishment of Fiber Optic based Communication Network on 220/132kV lines of J&K PDD under PMRP Scheme for JK-PDD (Now, JKPTCL) acting through Power Grid corporation of India limited. Scope comprises of Establishment of OPGW network connecting all the grid stations of JKPTCL (State utility) comprising of 1781 Kms across 76 Transmission lines including Survey, Design Supply and Installation of OPGW cable on 220/132kV lines of JKPDD. Total Contract Value: Rs. 53 Crores (Approx.). As of now 24 out of 75 links have been handed over to client.
 - i) Live and offline installation and commissioning of OPGW cables and associated hardware fittings - for different links of transmission lines of power grid in northeastern region and state utilities under NER wideband expansion project for NERTS, Power Grid Corporation of India limited. Scope comprises of live line and offline installation of 1276 Kms of OPGW cables and associated hardware fitting over 33 transmission lines of PGCIL & various state utilities of north-eastern states under as per Tech Specification under Packages- A and C. Total Contract Value: Rs. 15 Crore. As of now 1000 km has been completed out of 1276 Kms and 23 out of 33 links have been handed over to client.
- xvi HP Excise E-Governance Project -TCIL is implementing an e-governance system for excise functions of Himachal Pradesh Department of State Taxes & Excise, Government of Himachal Pradesh. The project involves designing, development, supply, installation, commissioning, implementation and maintenance of complete track-n-trace application along with automation of excise functions of Himachal Pradesh Excise Department.
- xvii UKSCB Project -TCIL has signed an agreement for “Supply, Implementation, Training and Commissioning of Core Banking Solution for State Co-operative Bank and District Co- operative Banks” on dated 21.01.2021 with Uttarakhand State Cooperative Bank in Uttarakhand. The scope of work is setting up of Data Center and providing the Core Banking Solution (CBS) services to Uttarakhand State Co-operative bank, District co-operative Bank and their various branches in Uttarakhand for five years. The total cost is Rs. 25 Crores approximately.

- xviii Wireless Infrastructure -TCIL's Wireless Infrastructure division has executed the following projects as under:

Atal Tunnel (also known as Rohtang Tunnel) is a highway tunnel built under the Rohtang Pass in the eastern Pir Panjal range of the Himalayas on the Leh-Manali Highway and it reduces travel distance between Manali and Leh by 46 km and travel time by four to five hours. To ensure proper coverage of network, TCIL has installed optical fiber plus leaky cable solution inside the tunnel. Further for mobile coverage outside tunnel, TCIL has installed outdoor antennas on both the portals for seamless network coverage.

- xix E-Governance -Online Examination: A project is awarded by Central Institute of Plastic Engineering and Technology (CIPET) for Organizing Online admission process for admission to Diploma/Post graduate Diploma Programs for the Academic year 2020-21 (Mobilization of candidates, registration, issue of admit cards, management of exam centres at various places in all states across India, organizing CBT based CIPET JEE & finalization of merit list etc.). Total no of candidates registered is 7578 & total no of candidates appeared for the said exam is 6152.

The said project has been successfully completed by TCIL.

- xx Civil Infrastructure Projects - Civil Division is performing various construction activities as consultant for Comprehensive Architectural Design services, Project Management Consultancy, EPC basis & Third Party Quality Inspection & Audit services for construction of Buildings, Roads and other various civil infrastructure works with expertise in Greenbuildings. Civil division is presently operating in more than twenty States of India delivering the complete infrastructure services. Meticulous planning, high quality standards and unmatched execution of the projects are the core strengths of Civil Division. At present civil division is dealing with more than Rs 3000 Crore of works, which are in different stages Civil Division is providing its Project Management Services, EPC Services & Third Party Quality Control services for various infrastructure sectors and has gained expertise in construction of Hospitals, Medical College, Engineering college, airports and tourism infrastructure projects specially.

- xxi KUWAIT - TCIL Kuwait has been awarded by ASSP GCC HSE Excellence 2021 GOLD AWARD for the HSE Excellence Category under Facility & Maintenance.

- xxii KSA - Under National Transformation Plan 2020 of Kingdom of Saudi Arabia, TCIL has successfully completed prestigious Saudi Government National Broad Band (NBB) project with Integrated Dawiyat (100% owned subsidiary of Saudi Electricity Company (SEC)), and Integrated Telecom Company (ITC). Under this project, TCIL has provided Civil & Fiber infrastructure i.e. Fiber to-the-Home (FTTH) Connectivity for every household in the country. Phase-VI of Dawiyat is under progress and is likely to be completed by next year. Also, the implementation of 21 FTTH Cabinets for M/s Integrated Telecom Company (SALAM) is under progress.

xxii Major Project Executed by TCIL in Oman:

Framework Agreement for FTTH Network Construction (Major Project), T-003I-2018, signed in October 2018 by TCIL with M/s Oman Broadband Company (OBB), a 100% owned by Sultanate of Oman for “FTTH Network Construction with all Civil and Telecom Works” for three years’ duration. A total of 8 work packages were awarded to TCIL in phased manner with an approximate contract value of OMR 3.0 million within three years’ timeframe.

Details of the major work packages awarded:

Upon signing of frame agreement for construction of FTTH network (T-003-2018) with OBB in October 2018, TCIL bagged eight work packages during 2019-20, 2020-21 & 2021-22) for a cumulative value of Rs. 57.57 crore.

The major activities carried out are given as under:

- a) Construction of duct system for laying OF Cables for Oman Broadband
- b) Supply & installation of duct system chambers/manhole/handholes
- c) Construction of Horizontal Directional Drilling (HDD) for major road crossings for Duct Systems
- d) Installation of Street FDH (Fiber Distribution Hub) for FTTH Network
- e) Pulling of Optical Fiber Cables in existing & new laid Duct systems
- f) Supply & fixing of Splice Closure after splicing fibers in the NAPs/Branch joints (BJs)
- g) Splicing/Termination/Testing of Fibers and Handing over of FTTH Network
- h) Laying of Pipes to individual House for House Connection for said created FTTH Network

5.4.4 Awards & Recognition:

- a) TCIL received the Coveted Semi-finalist position with Award given on the basis of details of Bharatnet VSAT Project being executed by TCIL, at the skoch Order-of-Merit Awards Event held on 9th April 2020.

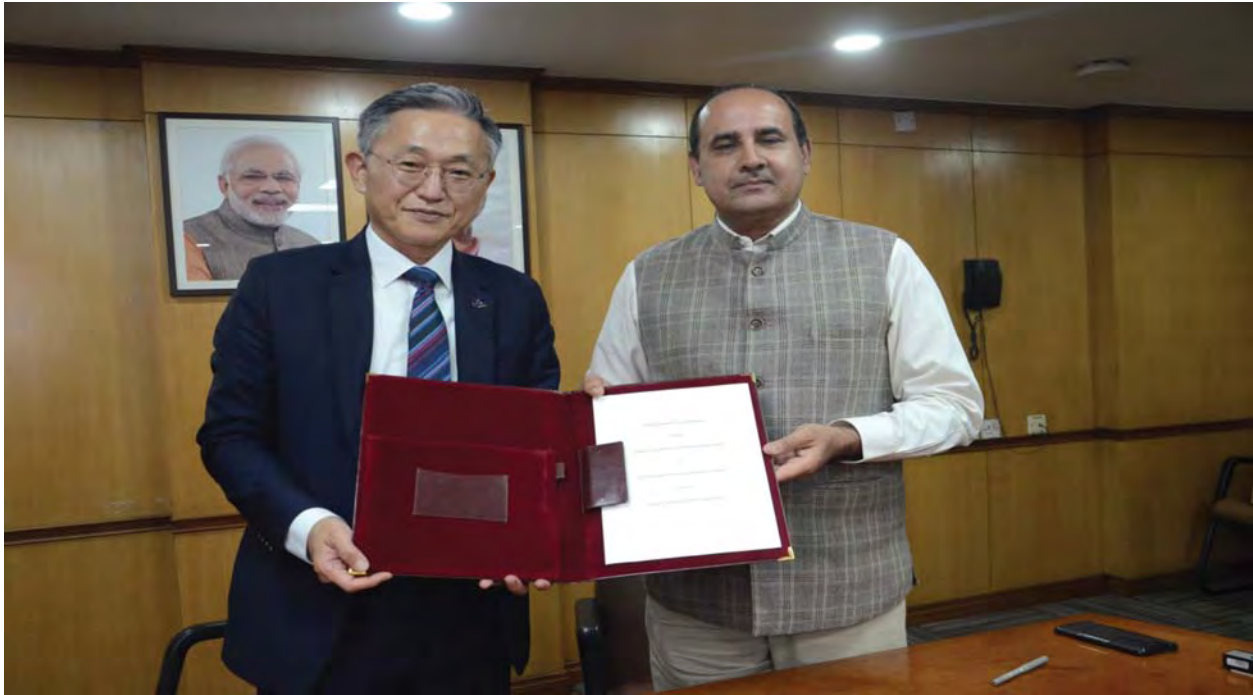
5.4.5 Human Resource Management:

TCIL has got working strength of 766 employees comprising of 365 Executives and 411 Non-Executives (including employees on deputation) as on 30.09.2022. The retirement age in the company is 60 years.

5.4.6 Disinvestment of TCIL through IPO:

TCIL has received approval from the Govt. for divestment through IPO. TCIL is among the six Central Public Sector Enterprises that the Government of India proposes to list on the stock exchange through public issue.

- i. TCIL with support of SDMC launched first e-vehicle charging station in South Delhi area at South Extension Part I on 20.01.2022.
- ii. TCIL entered into an MoU on 5th August, 2022 with an endeavor to promote partnership and collaboration in ICT and Technology with Born2Global, a Korean PSU.



5.5 BHARAT BROADBAND NETWORK LIMITED (BBNL)

5.5.1 Bharat Broadband Network Limited (BBNL) was incorporated as a Special Purpose Vehicle (SPV) of BharatNet (earlier known as National Optical Fibre Network) in 2012, as the executing agency for BharatNet. To synergize the O&M and Utilization of BharatNet network, Union Cabinet, on 27.07.2022 approved the proposal for merger of BBNL with BSNL. The activities regarding formal merger of BBNL with BSNL is under process.

BharatNet project is being implemented in a phased manner to create network to connect all the Gram Panchayats (GPs) with broadband in the country. This infrastructure is leased to TSPs/ISPs for provision of internet connectivity in GPs/rural areas including villages/ Government institutions, schools and private areas.

5.5.2 BharatNet Phase- I: BharatNet Phase-I has been implemented by tapping existing Fibre of Bharat Sanchar Nigam Limited (BSNL). The target of completing 1,00,000 GPs under Phase-I of BharatNet was achieved in December 2017. Subsequently, the work front of Phase-I was revised to 1.20 lakh GPs (approx.) which is almost completed. Only 742 GPs are pending due to Right of Way (RoW) permission, local issues etc.

5.5.3 BharatNet Phase- II: BharatNet Phase-II in Andhra Pradesh, Maharashtra, Gujarat, Telangana, Chhattisgarh, Jharkhand, Odisha and Tamil Nadu assigned to State Implementing

Agencies, Madhya Pradesh, UPE, UPW and Sikkim assigned to BSNL. BharatNet Phase-II in Bihar and Punjab is implemented through BBNL led Private Model. As on 14.11.2022, out of 97,271 GPs planned on OFC in BharatNet Phase-II, 58,705 have been made service ready.

BharatNet in about 5166 GPs of remote and hilly areas have been planned on satellite media. Out of this, implementation in 1408 GPs is being done by BSNL and implementation in 3758 GPs is being done by BBNL. As on 14.11.2022, 4468 GPs have been made service ready.

5.5.4 Share Holding Pattern: The authorised share capital of BBNL is 100 crore equity share of Rs. 10/- each i.e. total authorised capital is Rs. 1000 crore. The issued, subscribed and fully paid share capital is 6,00,00,003 equity shares of Rs. 10/- each. Out of total issued subscribed and fully paid share capital, the Government of India holds 6 crore equity share of Rs. 10/- each valued Rs. 60,00,00,000.00. Apart from that Bharat Sanchar Nigam Limited, Power Grid Corporation of India Limited (PGCIL) and RailTel Corporation of India Limited hold one equity share each of Rs. 10/-.

5.5.5 Financial Performance: The Financial performance during previous years has been as follows:

Financials and Turnover

(In Rs.)

Year	Turn Over		Total Expense	Profit / (Loss) Before Tax	Tax Expense	Profit / (Loss) after tax
	Income from Operation	Other Income				
2019-20	22,14,47,931	8,96,96,81,577	9,15,90,03,353	3,21,26,155	(2,52,352)	3,23,78,507
2020-21	23,45,71,519	9,10,17,50,155	9,31,45,77,857	2,17,43,817	72,54,944	1,44,88,813
2021-22	40,74,62,520	14,74,56,53,848	15,17,79,90,571	2,48,74,203	Nil	2,48,74,203

Note: As per audited annual financial statements.

5.5.6 Physical performance of BBNL:

S. No	State	No. of GPs planned				No. of GPs service ready				OFC Laid (Km)		
		PH-I	PH-II (OFC)	PH-II (Sat.)	Total	PH-I	PH-II (OFC)	PH-II (Satellite)	Total	PH-I	PH-II	Total
1	Assam	1506		5	1511	1506		5	1511	4877		4877
2	Bihar	5655	2669	16	8340	5655	2645	16	8316	16454	10959	27413
3	Chhattisgarh	4050	5964	20	10034	4050	5372	11	9433	13181	28386	41567
4	Haryana	6082		0	6082	6082			6082	11901		11901
5	Jammu & Kashmir	413		692	1105	413		678	1091	860		860
6	Karnataka	6084		0	6084	6084			6084	14217		14217
7	Kerala	977		1	978	977		1	978	829		829

DEPARTMENT OF TELECOMMUNICATIONS

8	Madhya Pradesh	12544	5286	35	17865	12543	5200	32	17775	39578	28142	67720
9	Maharashtra	15171	12740	6	27917	15165	8212	5	23382	34079	49022	83101
10	Punjab	7951	4713	4	12668	7951	4713	4	12668	12592	11871	24463
11	Rajasthan	8747		30	8777	8740		30	8770	30139		30139
12	Uttar Pradesh (E)	17726	16807	11	34544	17658	11852	10	29520	36606	40283	76889
13	Uttar Pradesh (W)	10305	2127	23	12455	10229	0	23	10252	21943	5053	26996
14	Uttarakhand	1819		175	1994	1589		162	1751	3803		3803
15	West Bengal	2676		3	2679	2437		3	2440	9481		9481
16	Sikkim	49	114	13	176	18		8	26	347	595	942
17	Chandigarh	12		0	12	12			12	19		19
18	Lakshadweep	0		10	10	0		9	9			0
19	Arunachal Pradesh	79		1079	1158	79		690	769	1519		1519
20	Nagaland	116		120	236	116		116	232	2000		2000
21	Manipur	315		1221	1536	315		1125	1440	634		634
22	Mizoram	41		500	541	41		411	452	689		689
23	Tripura	589		142	730	585		142	727	1686		1686
24	Meghalaya	122		597	719	122		559	681	1069		1069
25	Gujarat	6593	7669	26	14288	6582	7620	25	14227	20052	35246	55298
26	Daman & Diu	18		0	18	18			18	30		30
27	Dadra & Nagar Haveli	20		0	20	20			20	82		82
28	Puducherry	98		0	98	98			98	93		93
29	Andhra Pradesh	1681	11254	20	12955	1680	1326	11	3017	5420	26738	32158
30	Telangana	1946	10787	0	12733	1946	6695		8641	4772	23929	28701
31	Odisha	3810	2939	47	6796	3809	2932	38	6779	11985	20388	32373
32	Jharkhand	2707	1678	14	4399	2660	1672	2	4334	8212	8533	16745
33	Himachal Pradesh	252		159	411	252		156	408	781		781
34	Ladakh	0		193	193			192	192			0
35	Goa			0	0				0			0
36	Tamil Nadu	0	12524	0	12524	0	466		466		4289	4289
37	Andaman & Nicobar	66		4	70	46		4	50	207		207
	Total	120220	97271	5166	222657	119478	58705	4468	182651	310137	293434	603571

In addition, 41978 GPs and villages are being planned to be implemented under BharatNet Phase-III.

5.6 Centre for Development of Telematics (C-DOT)

5.6.1 Overview of C-DoT Activities

C-DoT (Centre for Development of Telematics) has successfully executed various projects of national & strategic importance that have played a pivotal role in achieving self-reliance, reducing dependence upon technology imports, boosting entrepreneurship, augmenting Intellectual Property (IP) assets and creating an ecosystem for indigenous telecom manufacturing. C-DoT solutions involve multiple industry stakeholders including System Integrators, Component Manufacturers, Telecom Service Providers, Internet Service Providers, etc. for proliferation of indigenous solutions.

C-DoT has made significant contributions towards several flagship missions of the Government of India viz. “Digital India”, “Make in India” and “Skill India”. C-DoT has been steadfast in its commitment towards building an “Aatmanirbhar Bharat”.

5.6.2 Key Project achievements

- i 5G Non Standalone (NSA) Core was successfully launched at IMC 2022 by Honorable Prime Minister of India at Pragati Maidan on 1st October 2022. 5G and E-health usecases were demonstrated using Remote patient cataract diagnosis portal and vital health parameters including ECG, BP, and temperature were shown to be monitored. It has been successfully integrated with indigenous RAN developed in collaboration with WiSig and VVDN.
- ii 4G Converged CORE- Successfully completed 4G core PoC for EPC functionality and demonstrated 5 million subscriber load at Ambala PoC site in BSNL network.
- iii 4GRAN – Prototype of 40Watt RRH Band-28, Band-41, Band-3, Band-1. Pilot manufacturing of Band-28, Band-1, Band-41, Band-8 and Band-3 by ITI.
- iv NDMA CAP- ITU-T CAP Early Warning System has been operationalized across PAN India in all 36 States & UTs for location-based SMS services for disaster management. PoC implementation of other dissemination media(TV, Radio, Coastal Siren, Cell broadcast) is also in progress
- v COVID-Savdhan application developed to convey Covid/disaster messages to a targeted area in local languages is being used by 36 State/UTs. Around 3.54 billion SMSs have been sent to public using the same.
- vi QKD - C-DoT has completed the development of QKD solution which can coexist on existing data carrying fibers (i.e. doesn't require dark fiber for QKD's Quantum or Classical channels). Techno-commercial proposal of QKD solution has been sent to C-DAC and DRDO based on their request. Administrative approval has been received from NSCS for funding C-DoT's MDI-QKD project.
- vii TSOC (Telecom Security Operation Centre) - C-DoT developed its own 200 G

internet probe. Total 38 ISP Gateways covered to analyse internet data for malicious traffic. C-DoT has successfully developed 400G IPFIX probe and it is deployed at one ISP site. Dashboard for organizational level monitoring was also made available.

- viii PM-WANI Central Registry is enabled with 16 regional languages now. PM-WANI hotspots are now shown on the MAP on the main page of Central Registry. Complete BSNL Wi-Fi network as well as RailTel network has been successfully migrated to PM-WANI by deployment of WANI token handler.
- ix PM-WANI Service Delivery Platform - C-DoT enabled 67 PDOAs and 62 APP providers on C-DoT developed "WANI As a Service"(WaaS) stack. Revenue settlement, Help Desk and Device manager modules enabled for all PDOAs. Migration of BSNL WiFi deployment was done in cluster of villages in Akola to PMWANI configuration.
- x Samvad received for 12th edition of AGBA awards on February 25, 2022. SAMVAD solution has been hosted and offered to many Government organizations like DoT, Prasar Bharati, DRDO, MHA, NSCS, CSIR, SPG, Delhi Police, MP Police, Income Tax Department etc. on trial basis. PO has been received from SPG for Samvad deployment.
- xi Wayfinder webclient was integrated with Zoho backbench App for IMC event. Visual positioning system based indoor navigation and positioning system using AI based algorithm is accomplished.
- xii Implementation of Face recognition in C-DoT is completed in Delhi and is ongoing for Bengaluru. Attendance system for TCIL is being developed.
- xiii Video Conferencing solution has been hosted and is being used by various Government departments / organizations including India Post, Railways, Prasar Bharti, DoT, NSCS, TSDSI and IITs.
- xiv Quantum Safe Cryptography: Lab prototype of Quantum-safe smart Video IP Phone has been developed and has been offered to DRDO-SAG for 3rd party Security Evaluation.
- xv XGS PON: XGS-PON 4 Port Mini-OLT Technology Approval accorded by TEC. C-DoT has received PO from RailTel for 100,000 GPON/EPON ONTs.
- xvi CEIR: CEIR ready for launch in Karnataka and six North East States. Enhanced Indian Counterfeited Device Restriction (ICDR) release installed in field
- xvii Indigenous Wi-Fi - Development of indigenous Wi-Fi-6 Access Point and low cost Wi-Fi-5 Access Point for PMWANI segment has been completed. Wi-Fi 6 AP has been deployed in Ganpath University for POC and working fine since Aug-2022.
- xviii M2M: Centre of Innovation (COI) and Entrepreneurship Cell has been setup at C-DoT Delhi and integration with start-ups initiated. 34 Industry partners/Startups registered. MoU signed with Vodafone Idea.

5.6.3 The progress made in major technology programs

- i. Next Generation Mobile technologies
 - a) 5G-CORE - 5G Non-Stand Alone (NSA) Core has been successfully launched in IMC 2022 by Hon'ble Prime Minister of India. The development on 5G Core (SA) is in progress.
 - b) 5G-RAN (Radio Access Network): The development of 5G RAN is under progress.
 - c) 4G CORE- 4G PoC successfully completed for EPC functionality at Ambala and Chandigarh in the BSNL network. Rollout of the solution expected shortly in the BSNL network. Preparation of LTE-R POC in Railways with C-DOT 4G core and C-DOTs and Lekha's enodeB going on. Equipment installed in the field at Secunderabad.
 - d) 4G-RAN –Development of 40Watt RRH Band-28, Band-41, Band-3, Band-1. TOT given to ITI and they have started the procurement of components for building C-DOT RAN. TEC Testing of C-DoT RAN under progress.
- ii. Carrier networks transport technologies
 - a) Packet Optical Transport Platform (POTP)
 - b) XGS-PON (10-Gbps Symmetrical Passive Optical Network)
- iii. CoE (Centre of Excellence) for Lawful Interception
 - a) Artificial Intelligence (AI) / Machine Learning (ML) Solutions: 5G and e-health usecases were demonstrated during 5G launch at IMC 2022.
 - b) C-DoT Video Conferencing Solution - C-DoTmeet Media and load enhancements is being underway of development. C-DoTmeet Security enhancement (quantum safe) is also under progress. Secured VC in SDCN network using CEM was also demonstrated at India Mobile Congress.
 - c) Chatbot Solution: Chatbot solution for C-DoT website and Samvad using open source framework has been developed. Validation of Chatbot is currently in progress.
 - d) Quantum Secure Smart Video IP Phone (QSSVIP) -Lab prototype of Quantum-safe smart Video IP Phone is developed and has been offered to DRDO-SAG for 3rd party Security Evaluation.
 - e) Quantum Key Distribution (QKD) - C-DoT has completed the development of QKD solution which can coexist on existing data carrying fibers where it doesn't require dark fiber for QKD's Quantum or Classical channels.
- iv. Telecom Service Applications
 - a) M2M Communication
 - b) PM-WANI Service Delivery Platform

- v. DOT projects
 - a) TSOC (Telecom Security Operation Centre)
 - b) CEIR (Central Equipment Identity Register)
 - c) PM-WANI Central Registry

- vi. NSCS Projects

The NSCS has approved the following research & development projects to C-DoT:

- a) High Capacity FPGA based IP flow information Export (IPFIX) probe and Data Analytics.
- b) Design and development of Measurement Device Independent Quantum Key Distribution (MDI-QKD).
- c) Design and development of National Trust Centre.

- vii Major Field implementations, roll-outs, customizations

- a) National Disaster Management Authority (NDMA) CAP EWS - All 5 Telecom Operators Airtel, BSNL, MTNL, Reliance, Jio & Vi have been integrated for targeted SMS dissemination in vernacular languages. Pan India deployment completed for targeted SMS dissemination and user details are awaited from 2 States (Madhya Pradesh, Telangana) for activation. Till 15th August 2022, a total of 75 Crore geo-targeted SMS disseminated across India during different disaster situations. IMD HQ and 29 regional centers, CWC, INCOIS, & DGRE have been successfully integrated for alert generation.

E-Trainings were conducted for all the 36 State/UTs and Alert Generating Agencies. On-Site Training Mock drills conducted in 27 States/UTs. Cell broadcast pilot implementation carried out in limited scale with TSPs. Solution can be developed by C-DoT, however RAN integration to be taken care by TSPs.

C-DoT successfully conducted a national workshop on “CAP Integrated Alert System” on 31st August 2022 for the stakeholders of the project with officials’ participation from MHA, DoT, MoIB, NDRF, State governments and all other stakeholders across India.

- b) NMS (Network Management System): - Unified Network Management System (UNMS) for monitoring “State Led, Satellite & BharatNet Phase I and II projects” has been deployed. Enhancements & support for the same is in progress. Support and maintenance of Business Exchange Gateway for BBNL is also in progress. CiSTB Billing -Pre paid Cable billing V2.0.0 released to PI and is under support. WiFi EMS Development is also in progress. Mobile App developed by C-DoT is also deployed in BharatNet.

- c) C-DoT Routers and Switches – Terabit Routers are supplied for TSOC network. C-DoT's high capacity switch was used in POC of 4G solution as the switch fabric and is currently used as 4G data plane acceleration solution. C-DoT STBR is being positioned for additional requirements of TSOC and CMS-IMS network. The enquiry has been sent to TOT partners for manufacturing. The assembly of the first prototype of 400G Telco Data Centre Switch has been completed and hardware integration testing has been completed. Porting of platform software is in progress. High capacity routing system has been offered for Security Testing to NCCS and its EAL-3 certification has been initiated. The EAL-3 testing of Secure Router is also in progress

5.6.4 Technologies transferred

In support of Government's Make in India and Digital national programs C-DoT promoted the indigenous technology development and manufacturing eco-system.

Cumulatively, C-DoT ToT agreements stand at 117 with 32 Licensees for 36 technologies, and thereby a manufacturing eco-system for production of indigenous technology has been established to realize Government's Make-in India and Digital India programs.

One significant development is signing ToT with M/S ITI Limited for the LTE-4G RAN technology for the POC and for mass production. Efforts are being made to add few more ToT partners for LTE-4G RAN technology soon. Also, C-DoT has signed ToT agreement for the WiFi-5 and WiFi-6 Technologies (DOA, WGR, EAP and XAP cards for indoor and outdoor solutions).

Efforts are being made for the signing of ToT Agreement for the QKD and STB Technology products during the current financial year.

5.6.5 IPR Asset status

Intellectual properties and publications in FY 22-23 (Till Sept'22)

Intellectual Property Asset	Number
Patents Granted	2
Patents Filed	7
Copyright Granted	5
Designs Filed	2
Trademark Granted	2
Papers presented in national and international conferences and seminars	3

5.6.6 Business Promotion Activities during FY 2022-23 (April 2022 – October 2022)

- i Events and Exhibitions

- a) Conference with the members of Voice of Indian Comm Tech Enterprises (VoICE) on C-DoT Collaborative Research Program on 26 April 2022

C-DoT held insightful deliberations with the members of Voice of Indian Comm Tech Enterprises (VoICE) on C-DoT Collaborative Research Program in line with the objectives of “Aatmanirbhar Bharat” amid insightful talks by domain experts. The representatives from industry, academia & startups offered their enriching views and suggestions on strengthening the proposed collaboration and innovation framework for indigenous capacity-building.

- b) MoU signing between C-DoT and C-DAC at SemiconIndia 2022, on 30 April 2022

C-DoT and C-DAC signed an MoU at SemiconIndia 2022 for cooperation in diverse areas of Telecom & ICT to boost indigenous technological design & development

- c) MoU signing between C-DoT and Indian Railways on 27 April 2022

C-DoT and Indian Railways signed an MoU for establishing a robust collaborative working partnership to meet the emerging requirements of Indian Railways with indigenous Telecom technologies & innovative solutions

- d) Webinar on “Centre of Innovation (COI) for IoT/M2M” on 17 May 2022

C-DoT organized a webinar on “Centre of Innovation (COI) for IoT/M2M” to mark the observance of World Telecommunication & Information Society Day (WTISD) 2022. The webinar underscored the critical need of having a dedicated Centre of Innovation to achieve synergy across relevant stakeholders & spur development & deployment of standards based indigenous IoT/M2M solutions

- e) MoU signing between C-DoT & Vodafone Idea, on 18 May 2022

C-DoT & Vodafone Idea sign an MoU for cooperation in the area of IoT/M2M to fast track indigenous development & deployment of oneM2M standardized interoperable solutions in collaboration with IoT device and application providers

- f) Showcased its indigenous AI/ML solutions at BIS-22, BEL IETE Symposium, on 20 May 2022

C-DoT showcased its indigenous AI/ML solutions at BIS-22, BEL IETE Symposium; Director, C-DoT made a presentation on C-DoT’s AI/ML product portfolio

- g) Agreement signing with Galore Networks for indigenous development of 5G ecosystem, on 24 June 2022

C-DoT signed a collaborative agreement with Galore Networks for indigenous development of 5G in furtherance of the objective of creating a multi-party 5G ecosystem powered by cutting-edge innovation & healthy competition

- h) C-DoT signed agreement with VVDN Technologies and Wisig Networks for

collaboration in 5G, on 2 June 2022

C-DoT, VVDN Technologies and Wisig Networks signed an agreement for collaboration in 5G; This aimed at leveraging the complementary strengths of Telecom R&D and industry to accelerate the indigenous design, development & deployment of end-to-end 5G solutions

- i) C-DoT demonstrated its indigenous Telecom technologies at CommunicAsia 2022, Singapore, during 1-23 June 2022
- j) C-DoT showcased its indigenous technologies at “Telecom Investor Roundtable “on 30 July 2022

C-DoT showcased its indigenous technologies at “Telecom Investor Roundtable: The Indian 5G Opportunity” & held insightful deliberations with industry, startups & investors for 4G & 5G deployments



Shri Ashwini Vaishnaw, Hon'ble Minister for Railways, Communications, Electronics & Information Technology at C-DoT's stall in the exhibition

- k) MoU was signed between C-DoT and ITI for mass manufacturing on July 7, 2022
 MoU was signed between C-DoT and ITI on July 7, 2022 to establish a framework for cooperation in 'Technology transfer of LTE/LTE-A/4G technology based Wireless Communication Systems for ITI Limited to mass manufacture and supply it to potential customers'
- l) C-DoT at Electronics Summit 2022 in Bengaluru, during 7 -8 July 2022

C-DoT showcased its security-centric indigenous Telecom technologies & innovative ICT solutions for building robust networks for Defence applications at ELCINA Strategic Electronics Summit 2022 in Bengaluru

- m) All India Workshop on Common Alerting Protocol (CAP) based Integrated Alert System- SACHET organized by C-DoT and NDMA, on 31 August 2022

C-DoT and NDMA organised an All India Workshop on Common Alerting Protocol (CAP) based Integrated Alert System- SACHET to train state Governments to mitigate effects of disasters. The workshop aimed to provide a platform to all the stake holders including Alert Generating Agencies, Alert Authorising Agencies and Alert Disseminating Agencies across India to discuss their underlying concerns and challenges and evolve the technology-based solutions to address these in an effective manner amid insightful discussions by a galaxy of experts and technologists.



Shri K Rajaraman, Secretary (Telecom) and Smt. BV Umadevi, Additional Secretary (Disaster Management), Ministry of Home Affairs at the inaugural session of the workshop

- n) Brainstorming session with various stakeholders for collaboration in areas of 5G Core & RAN, on 12 August 2022

C-DoT conducted an interactive brainstorming session with various stakeholders of indigenous Telecom ecosystem including startups & academia to discuss proposals for funding & collaboration in areas of 5G Core & RAN

- o) Demonstration of our 4G & 5G systems at ITU Regional Standardization Forum, on 8 August 2022

C-DoT demonstrated its indigenous 4G & 5G systems to dignitaries & delegates from around the world at ITU Regional Standardization Forum on Regulatory & Policy aspects of Telecommunications/ICTs in New Delhi



*Shri Devusinh Chauhan, Hon'ble Minister of State for Communications,
Government of India at C-DoT stall in the exhibition*

- p) MoU signed with IIT for cooperation in various emerging areas of Telecom including IoT/M2M, AI/ML, Cyber Security and 5G & Beyond technologies, on 27 September 2022

C-DoT and IIT, Delhi signed an MoU for cooperation in various emerging areas of Telecom including IoT/M2M, AI/ML, Cyber Security and 5G & Beyond technologies; The MoU aimed at strengthening the collaboration between R&D and academia paving the way for expeditious design & development of indigenous Telecom solutions; This would be conducive for establishing a collaborative framework based on synergy and convergence amongst students, faculty and researchers right from the stage of ideation & conceptualization

- q) Visit of Lt Gen M U Nair, SO-in-C, Indian Army to C-DoT Campus, Delhi, on 17 September 2022

Lt Gen M U Nair, SO-in-C, Indian Army visited C-DoT Campus, Delhi, interacted with researchers amid demonstration of C-DoT's home-grown technologies and offered valuable advice on aligning the indigenous technologies with defence-centric requirements.

- r) Showcased telecom technologies at India Africa ICT Expo, Accra, Ghana, during 14 – 15 Sep 2022

C-DoT showcased its indigenous Telecom technologies & innovative solutions at India Africa ICT Expo, Accra, Ghana and held deliberations with dignitaries & visitors to explore business opportunities in Africa

- s) Showcased live demonstration of our indigenous Telecom technologies DefExpo 2022, Gandhinagar, Gujarat, during 18 – 22 Oct 2022

C-DoT showcases the live demonstration of its indigenous Telecom technologies & innovative solution at DefExpo 2022, Gandhinagar, Gujarat (18 – 22 Oct 2022) with key focus on building secure communications infrastructure for defence & strategic applications.

- t) Launch of indigenous 5G NSA Core at India Mobile Congress 2022, during 1-4 October 2022

C-DoT demonstrated its cutting-edge indigenous Telecom technologies and innovative solutions at India Mobile Congress (IMC) 2022; The Prime Minister, Shri Narendra Modi launched wholly indigenous 5G NSA Core designed and developed by C-DoT, at India Mobile Congress 2022; End-to-end indigenous 5G NSA call was demonstrated using C-DoT's Core and Radio Access Network (RAN) developed in collaboration with industry and start-ups; A 5G use-case pertaining to remote medical assistance in rural areas and hilly terrains was demonstrated to the Prime Minister.



Hon'ble Prime Minister Shri Narendra Modi launching C-DoT 5G NSA Core in the presence of Shri Ashwini Vaishnaw, Minister for Railways, Communications, Electronics & Information Technology, and Shri Devusinh Chauhan, Minister of State for Communications, Government of India

5.6.7 Awards and Recognitions

C-DoT was declared winner at ELCINA Defennovation Awards - Strategic Electronics Summit (SES 2022) in the month of July 2022 at Bangalore in following two categories -

- i. Excellence in R&D: Quantum Key Distribution (QKD) solution Secured “Certificate of Merit” in “Excellence in R&D” -Large scale category
- ii. Excellence in Indigenisation: SAMVAD, QKD and BBWT Secured “First prize” in “Excellence in Indigenisation”- Large scale category

5.6.8 Anticipated achievement (January 2023 to March 2023)

- i 4G Core- Rollout of 4G /LTE IMS core in BSNL Network.
- ii 4G Radio Access Network (RAN) - Prototype of 40Watt Radios in Band-1, Band-3, Band-8, Band-28 and Band-41. Pilot manufacturing of these bands through through ITI.
- iii 4G PoC in railways - Integration and testing of 4G Core and 4G RAN with railways elements like Kavach (TCAS), LES,KAS, MCX, Cab radio, user devices etc
- iv 5G RAN development along with industry partners.
- v 5G Non-Standalone (NSA) Core- Integration of 5G NSA RAN with 5G NSA in BSNL N/W and field trial of 5G services
- vi 5G Standalone Core – Modification of 5G SA Core (developed under test bed) for making it carrier grade. Design & Development of Smart NIC data accelerator board.
- vii Telecom Security Operation Centre (TSOC) - Deployment of C-DoT Network Probes and routers at all ISP gateways(120) and Central Big Data platform for intelligence generation using the data received from the probes
- viii Common Alert Protocol (CAP) compliant Early Warning Platform - Enhancements in NDMA CAP Project (Phase 1) for Disaster Management, Priority Call routing system (PCR) and Planning for Phase-2.
- ix PM-WANI Central Registry - Development of roaming exchange, Monetization module and certification of PDOAs
- x PM-WANI Service Delivery Platform- Migration of existing Wi-Fi network of ISP's, Smart cities, Airports and Hospitals (AIIMS) to PM-WANI, Full Stack development of PDOAs service platform including payment settlement.
- xi Wi-Fi technologies- Development of Wi-Fi 6 Access Point 4x4 and 2x2 variant and consolidated EMS for Wi-Fi product line
- xii Joint development with IIT Delhi for HAPTICS/ eHealth. Design and development of AI solutions for NCRTC, Railways etc.

- xiii 100G solution based on Radio over Ethernet and 100G WDM-PON (Wavelength Division Multiplexing based PON) for 5G front haul.
- xiv Optical Cross Connect (4.8T/9.6T capacity) in joint collaboration with Priyaraj Electronics Ltd.
- xv Development of 1Gpbs Post quantum Inline Encryptor (PINE).
- xvi SAG approval of SAMVAD and VC and security enhancements
- xvii MDI-QKD- Lab prototype of Alice and Bob node.
- xviii Single Photon Detector- Architecture finalization of Single Photon detector.
- xix Smart Energy Meter- Smart meter development based on 4G communication module and development of HES software with industry

Chapter 6
Regulatory and Appellate Bodies

Chapter 6

Regulatory and Appellate Bodies

6.1 TELECOM REGULATORY AUTHORITY OF INDIA (TRAI)

The Telecom Regulatory Authority of India (TRAI) has played a pivotal role and contributed significantly in the growth of telecom and broadcasting services. The regulatory initiatives of TRAI have resulted in overall benefits to the consumer in terms of choice of services, affordable tariff of these services, better quality of service and etc. This year marks completion of twenty-five years of TRAI.

During the year 2022-23, the various regulatory initiatives taken by the Authority including the Recommendations to the Government on key issues concerning telecommunications and Broadcasting sector, framing Regulations, issuing Consultation Papers, Tariff Orders and information regarding Consumer outreach by TRAI and Other Administrative initiatives are discussed briefly in the following paragraphs:

6.1.1 Recommendations

During the year 2022-23, the Authority made the following Recommendations to the Government:

- i. Recommendations dated 11th April 2022 on “Auction of spectrum in frequency bands identified for IMT / 5G”

The Department of Telecommunications (DoT), through its letter dated 13th September 2021, had, inter-alia, requested TRAI, under section 11(1)(a) of the TRAI Act of 1997, to furnish its recommendations on “*Auction of spectrum in the frequencies identified for International Mobile Telecommunications (IMT)/5G*”. The recommendations were sought on applicable reserve price, band plan, block size, quantum of spectrum to be auctioned and associated conditions for auction of spectrum in 526-698 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300-3670 MHz and 24.25 – 28.5 GHz bands for IMT/5G. Further, recommendations were sought on quantum of spectrum / bands, if any, to be earmarked for private captive / isolated 5G networks, competitive / transparent method of allocation, and pricing, for meeting the spectrum requirements of captive 5G applications of industries for machine / plant automation purposes / M2M in premises.

In this regard, TRAI issued a Consultation Paper on ‘Auction of spectrum in frequency bands identified for IMT/5G’ on 30th November 2021 providing the background information and seeking inputs from the stakeholders. Through this Consultation Paper, stakeholders were requested to furnish their comments on various issues raised in the consultation paper.

In response to the Consultation Paper, Comments and Counter Comments were received. The comments and counter comments received from the stakeholders were placed on TRAI’s website www.trai.gov.in. The comments received from the stakeholders were very extensive. Open House Discussion (OHD) was conducted on 8th February 2022 through

online mode, which was participated by stakeholders including TSPs, Industry Associations – Indian and Global, Satellite operators, Solution providers, Consultants, and Individuals.

Based on the comments/inputs received from the stakeholders and on its analysis, TRAI finalized its Recommendations on 'Auction of spectrum in frequency bands identified for IMT/5G' on 11th April 2022. The recommendations made by TRAI include recommendations related to Auction of Spectrum for 5G/IMT such as Quantum of Spectrum to be auction, Band Plan, Block Size, Eligibility Conditions for participation in Auction, Interference mitigation in TDD bands, Roll-out obligations, Spectrum Cap, Surrender of Spectrum, and Valuation and Reserve Price of Spectrum. In addition, considering the importance of 5G in Industry verticals, recommendations relating to spectrum for Captive wireless private networks and Identification, Development & Proliferation of 5G Use Cases have been made.

The key recommendations are listed below:

a) Auction of Spectrum

- 1) All available spectrum in existing bands viz. 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz and new spectrum bands viz. 600 MHz, 3300-3670 MHz and 24.25-28.5 GHz, be put to auction.
- 2) For 600 MHz band, APT 600 (Option B1) band should be adopted. By adopting this band plan, additional 10 MHz of spectrum will be made available for IMT. This band will provide total 40 MHz (paired) spectrum. It is also proposed that entire 40 MHz (paired) spectrum [612-652 MHz/663-703 MHz] should be put to auction in the forthcoming auction.
- 3) In the frequency range 3300-3670 MHz, both the band plans i.e., n77 and n78 should be permitted and flexibility be given to the TSPs to adopt any band plan i.e., n77 or n78, based on their business/commercial considerations.
- 4) In the frequency range 24.25-28.5 GHz MHz, flexibility be given to the TSPs to adopt any band plan i.e., n257 or n258, based on the frequencies assigned to them and other business/commercial considerations.
- 5) To provide flexibility to the TSPs, block size of 10 MHz for 3300-3670 MHz band and 50 MHz for 24.25-28.5 GHz band recommended. Spectrum to be assigned in a contiguous manner.
- 6) Considering the facts that presently (i) band plan(s) for the frequency range 526-612 MHz is yet to be defined by 3GPP/ITU, (ii) development of ecosystem for IMT in 526-612 MHz frequency range will take some time and (iii) MIB is using 526-582 MHz band extensively across the country for TV transmitters; the 526-612 MHz frequency range should not be put to auction in the forthcoming auction.
- 7) DoT should come out with a plan for refarming 526-582 MHz band to be utilized for IMT deployments. To make 526-582 MHz band available for IMT, DoT should work

with MIB to prepare a plan for an early migration from Analogue to Digital Transmission, so that the frequency band from 526-582 MHz can be vacated for IMT services.

- 8) DoT should carry out harmonization exercise in 800 MHz, 900 MHz and 1800 MHz bands immediately after conducting the auction so that frequencies assigned to the TSPs are in contiguous manner.

ii Reserve Price and Easy Payment Options

- a) Recommended Reserve Price for various spectrum bands (for 20 years) is as per table given below:

Reserve Price of spectrum per MHz for 20 years

Service Area	600 MHz band	700 MHz band	800 MHz band	900 MHz band	1800 MHz band	2100 MHz band	2300 MHz band	2500 MHz band	3300-3670 MHz band	24.25-28.5 GHz band
	(Paired)						(Unpaired)			
	(in Rs. Crore)									(in Rs.)
Delhi	509	509	479	436	270	224	104	86	40	89 lakh
Kolkata	173	173	153	153	97	80	32	28	15	32 lakh
Mumbai	470	470	468	389	236	196	103	81	35	78 lakh
Andhra Pradesh	318	318	292	288	172	142	59	51	26	57 lakh
Gujarat	282	282	262	399	150	125	NA	44	23	50 lakh
Karnataka	220	220	198	204	121	100	64	47	18	40 lakh
Maharashtra	359	359	338	317	190	158	NA	53	29	63 lakh
Tamil Nadu	253	253	225	222	141	NA	81	58	21	46 lakh
Haryana	71	71	62	68	41	34	NA	NA	6	13 lakh
Kerala	110	110	103	213	58	48	NA	NA	9	19 lakh
Madhya Pradesh	156	156	136	156	88	73	NA	NA	13	29 lakh
Punjab	112	112	101	104	61	51	NA	14	9	20 lakh
Rajasthan	146	146	142	135	75	NA	NA	NA	11	25 lakh
U. P. (East)	171	171	160	166	91	NA	NA	NA	14	30 lakh
U.P. (West)	154	154	133	152	87	72	NA	NA	13	29 lakh
West Bengal	102	102	89	99	58	37	NA	NA	9	19 lakh
Assam	57	57	50	56	32	24	NA	NA	5	10 lakh

Bihar	145	145	126	147	82	68	NA	15	12	27 lakh
Himachal Pradesh	26	26	22	26	14	12	NA	3	2	5 lakh
Jammu & Kashmir	16	16	14	16	9	8	NA	2	1	3 lakh
North East	15	15	13	14	8	5	NA	NA	1	3 lakh
Orissa	62	62	54	64	35	29	NA	NA	5	12 Lakh

- b) The reserve price of spectrum allocation in case of 30 years should be equal to 1.5 times the reserve price of spectrum allocation for 20 years for the respective band.
- c) For the long-term growth and sustainability of the telecom sector, infusing liquidity and encouraging investment, the Telecom Service Providers should be allowed easy payment options including part payment with flexibility of moratorium.

iii Easy Roll Out Obligations

- a) Unlike existing coverage-based rollout obligations, considering deployment of 5G network in 3300-3670 MHz and 24.25-28.5 GHz bands, easy network deployment-based roll-out conditions have been recommended for these bands.
- b) The roll-out obligations and associated conditions for 600 MHz band shall be same as that applicable for 700 MHz band.
- c) To facilitate the new entrants, in respect of roll out obligations for 700 MHz, 800 MHz, 900 MHz and 1800 MHz bands, the time period of 1 year for meeting the MRO for Metros LSAs (coverage of 90% of the LSA within one year from the effective date of license or the date of assignment of spectrum won in this auction process, whichever is later), should be enhanced to 2 years (40% coverage by the end of 1st year and 90% coverage by the end of 2nd year).

iv Rational Spectrum Cap

- a) Spectrum caps have been rationalized
 - 1) Cap of 40% on combined spectrum holding in sub-1 GHz bands.
 - 2) Cap of 40% on combined spectrum holding in 1800 MHz, 2100 MHz, 2300 MHz and 2500 MHz bands.
 - 3) Individual band specific cap of 40% for 3300-3670 MHz and 24.25-28.5 GHz spectrum bands.
 - 4) Overall cap across all bands has been done away with.

v Easy Surrender of Spectrum at Nominal Fee

For ease of doing business, easy and transparent spectrum surrender guidelines with a spectrum surrender fee of Rs. 1 lakh per spectrum band per LSA has been recommended.

- vi Coexistence of IMT and Satellite Earth Station – Ensuring efficient utilization of spectrum
 - a) Frequency range 27.5-28.5 GHz should be used for IMT as well as Satellite Earth Station Gateway (Earth to space) on coexistence basis.
 - b) The Satellite Earth Station Gateway should be permitted to be established in frequency range 27.5-28.5 GHz at uninhabited or remote locations on case-to-case basis, where there is less likelihood of 5G IMT services to come up.
 - c) DoT should prescribe the exclusion zone requirement for co-existence of IMT and satellite earth stations (Earth to space) in 27.5-28.5 GHz frequency range.
 - d) DoT should create a software defined automated process on a portal having database of coordinates of the IMT base stations in mmWave. The geofencing coordinates of the proposed earth station in 27.5-28.5 GHz can provide the feasibility results through the portal for establishing the earth station.
 - e) Access to 27.5-28.5 GHz should also be allowed for Earth Stations In Motion (ESIMs) for In-flight and maritime terminals, with appropriate sharing conditions, as in such cases, the operation would be geographically separated from terrestrial IMT.
 - f) As the IMT emissions in the 3300-3670 MHz may saturate the Low Noise Block (LNB) of the FSS earth station which traditionally operates in the 3400-4200 MHz, there is a need to make use of high-quality bandpass filters operating in 3700-4200 MHz range. Therefore, DoT should ask the Ministry of Information and Broadcasting (MIB) to take appropriate action and sensitize the MSOs, DTH operators, and other users to ensure the use of high-quality bandpass filters operating in 3700-4200 MHz range to avoid interference from IMT stations.
- vii Spectrum Roadmap
 - a) Additional bands which are already identified by ITU for IMT services and additional bands under consideration in WRC-23 for IMT identification, be explored for possibility to make these bands available for IMT services at the earliest and DoT should come out with a spectrum roadmap for opening up of new bands for IMT to meet the future demand.
 - b) At least a 5-year roadmap on spectrum likely to be made available for IMT in each year and likely date/month of auction should be made public. Such a spectrum roadmap will provide certainty, enable the bidders to take informed decisions and may also encourage new entrants.
- viii Private Network – Enabling Framework proposed
 - a) Enabling framework created for private networks: all options to be opened for uptake of captive wireless private networks, as below:
 - 1) Private network through TSPs using a Network Slice from TSP's PLMN network.

- 2) Enterprise may request TSPs to establish an independent isolated private network in enterprise's premises using the TSP's spectrum.
 - 3) Enterprise may obtain the spectrum on lease from TSPs and establish their own isolated Captive Wireless Private Network.
 - 4) Enterprise may obtain the spectrum directly from the Government and establish their own isolated Captive Wireless Private Network.
- b) For establishing captive wireless private network using IMT spectrum, the entity/enterprise should have a permission/license under Section 4 of the Indian Telegraph Act, 1885. Very light touch online portal-based regime for acquiring permission/license for 'Captive Wireless Private Network (CWPN)' has been recommended.
 - c) TSPs permitted to lease their spectrum to Captive Wireless Private Network permission holder/Licensees. Key elements to be included in the Guidelines for leasing of access spectrum by Telecom Service Providers to the Captive Wireless Private Network Permission holder/Licensees have been recommended.
 - d) Certain spectrum be earmarked for Captive wireless private networks to be assigned directly by DoT to Captive Wireless Private Network Permission holders/Licensees.
 - e) For assessment of demand of spectrum for private networks, DoT should create a portal, seeking demand for spectrum from companies.
 - f) Key elements to be included in the Guidelines for Spectrum Assignment to Captive Wireless Private Network Permission holder/Licensee have been recommended.
 - g) Captive Wireless Private network should not be connected to public network in any manner. The public network includes PSTN, PLMN, GMPCS and public internet.
- ix Development of 5G Use Cases and Applications – Proposed the Ecosystem for widespread adoption of 5G Technology and Digital Inclusion
- a) For uptake of 5G use cases in different verticals, A 5G-dedicated Inter-Ministerial Working Group (IMWG), under the Chairmanship of Member (Technology), DoT should be formed comprising Ministry of Electronics and Information Technology, Department for Promotion of Industry and Internal Trade, Ministry of Information and Broadcasting, Department of Space, Ministry of Finance, Ministry of Education, Department of Science & Technology, Ministry of Micro, Small and Medium Enterprises (MSME) and Niti Ayog as members, which should be represented by JS Level officers.
 - b) Telecom Innovation Centres to be formulated in alliance with different academic institutions and ministries, specialized for development of innovative solutions for 5G use cases and applications in different verticals / sectors.

6.1.2 The recommendations have been placed on TRAI's website www.trai.gov.in.

- i Recommendations dated 18th November 2022 on "Regulatory Framework for

Promoting Data Economy Through Establishment of Data Centres, Content Delivery Networks, and Interconnect Exchanges in India”

The Authority suo-moto issued detailed Consultation Paper on “Regulatory Framework for Promoting Data Economy Through Establishment of Data Centres, Content Delivery Networks, and Interconnect Exchanges in India” on 16th December 2021 to seek the inputs of stakeholders on regulatory framework for promoting the establishment of (i) Data Centres, (DCs) (ii) Content Delivery Networks, (CDNs) and (iii) Internet Exchange Points (IXPs) in the country. Subsequently, an Open House Discussion (OHD) was held on 6th May 2022 to seek further views of the stakeholders on various issues.

After considering the comments/inputs received from the stakeholders during consultation process and further analysis of the issues, Authority finalized these recommendations to boost to digital infrastructure ecosystem in the country including DCs, CDNs and IXPs and sent its recommendations on “Regulatory Framework for Promoting Data Economy Through Establishment of Data Centres, Content Delivery Networks, and Interconnect Exchanges in India” to DoT on 18th November 2022.

The recommendations have been placed on TRAI’s website www.traai.gov.in.

- ii TRAI’s Response dated 5th May 2022 to DoT back reference dated 9th March 2022 on Recommendations on “Licensing Framework for Satellite-based connectivity for Low Bit Rate Applications”

The Department of Telecommunications (DoT), vide its reference letter dated 23rd November 2020, under section 11(1)(a) of the TRAI Act, 1997 had requested TRAI to furnish recommendations on the Licensing framework to enable the provisioning of satellite-based low-bit-rate applications for both commercial as well as captive usage. TRAI furnished the recommendations on ‘Licensing framework for Satellites based connectivity for Low bit rate Applications’ dated 26th August 2021.

DoT, vide its letter dated 9th March 2022, has informed that the Digital Communications Commission (DCC) considered the TRAI recommendations in its meeting dated 4th January 2022 and decided to accept all the recommendations except para 4.9(ii) with regard to NLD SUC, which has been referred back to TRAI, under relevant section of the TRAI Act 1997.

After examining the comments of DoT, TRAI finalized its response to the back reference and sent them on 5th May 2022. The views given by the Authority have been placed on TRAI’s website www.traai.gov.in.

- iii TRAI’s Response dated 9th May 2022 to DoT back reference dated 29th April 2022 on Recommendations on Auction of Spectrum in frequency bands identified for IMT/ 5G

Through its reference dated 13th September 2021, Department of Telecommunications (DoT) had, inter-alia, requested TRAI to provide its recommendations on applicable reserve price, band plan, block size, quantum of

spectrum to be auctioned and associated conditions for auction of spectrum in 526-698 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300-3670 MHz and 24.25-28.5 GHz bands for IMT/5G. The Authority after detailed consultation process had sent its 'Recommendations on Auction of Spectrum in frequency bands identified for IMT/5G' dated 11th April 2022.

In its back reference dated 29th April 2022, DoT referred back some of the TRAI's recommendations on 'Auction of Spectrum in frequency bands identified for IMT/5G' dated 11th April 2022 with its comments / observations for reconsidered recommendations in accordance with the provisions of Section 11 of TRAI Act 1997, as amended in 2000. In addition, DoT enclosed its views on some of the TRAI recommendations and also informed that rest of the recommendations are acceptable.

After examining the comments of DoT, TRAI finalized its response to the back reference and sent them on 9th May 2022. The views given by the Authority have been placed on TRAI's website www.trai.gov.in.

- iv TRAI's Response dated 6th September 2022 to back reference dated 2nd August 2022 received from DoT on TRAI's Recommendations on "Enabling Unbundling of Different Layers Through Differential Licensing"

Department of Telecommunications (DoT) through their letter dated 2nd August 2022 informed that after detailed deliberations on TRAI's recommendations dated 19th August 2021 on 'Enabling Unbundling of Different Layers Through Differential Licensing', the Government has come to a prima facie conclusion that there may not be market demand for separate Access Network Provider (ANP) License. DoT have further intimated that the recommendations of TRAI on "Enhancement of Scope of Infrastructure Provider Category-I Registration" having similar facets are also being examined in DoT.

DoT, therefore, have informed that the TRAI recommendations on "Enabling Unbundling of Different Layers Through Differential Licensing" may not be accepted. In view of above, DoT have, as per relevant Section of the TRAI Act, referred back the TRAI's recommendations on "Enabling Unbundling of Different Layers Through Differential Licensing" for reconsideration.

After examination, TRAI has finalized its response to the back reference and sent them to DoT on 6th September 2022. The views given by the Authority have been placed on TRAI's website www.trai.gov.

- v TRAI's response dated 7th September 2022 to Ministry of Information and Broadcasting (MIB) back reference on TRAI's Recommendations on "Monopoly/Market Dominance in the Cable TV Services dated 26th November 2013"

Ministry of Information and Broadcasting (MIB) vide its letter no.9/115/2012-BP&L dated 19th February 2021, wherein MIB has referred back TRAI's Recommendations

on “Monopoly/Market Dominance in the Cable TV Services dated 26th November 2013”. Vide this letter, MIB informed TRAI that considerable time has passed since the above-mentioned recommendations were made by TRAI and that the media and entertainment (M&E) landscape has changed drastically, particularly with the advent of new digital technologies in this sector. Therefore, MIB requested TRAI to provide a fresh set of recommendations in the matter looking at the subsequent developments/expansion in the M&E sector.

In this regard, TRAI had issued a Consultation Paper on “Market Structure/ Competition in Cable TV Service” on 25th October 2021 for comments of stakeholders. After considering all comments received from stakeholders during consultation process and further analysis of the issues, the Authority finalized its recommendations and sent its response to MIB on 7th September 2022 to MIB back reference on TRAI’s Recommendations on “Monopoly/Market Dominance in the Cable TV Services dated 26th November 2013”.

6.1.3 Consultation Papers

During the year 2022-23, the Authority made following Consultation Papers to the Government:

- i Consultation Paper dated 12th April 2022 on “Issues relating to Media Ownership”

Media being the fourth pillar of democracy, performs a vital role in the personification of the constitutional goals and aspirations. Considering the importance of media in implementing the constitutional precept of freedom of speech and expression in letter and spirit, TRAI has sent its various recommendations to the government on issues relating to media ownership. The last of such recommendations was sent on 12th August 2014.

On 19th February 2021, the Authority received a reference from Ministry of Information and Broadcasting seeking reconsideration of its 2014 Recommendations and issuance of a fresh set of recommendations in the light of the emerging changes in the media and entertainment industry, particularly with the advent of new digital technologies such as Over-the-top platforms (OTT).

Accordingly, TRAI on 12th April 2022 released a Consultation paper on “Issues relating to Media Ownership” to seek views of the stakeholders on need, nature, and levels of safeguards with respect to issues relating to media ownership, particularly cross-media ownership and vertical integration in the broadcasting sector.

- ii Consultation Paper dated 7th May 2022 on “Issues related to New Regulatory Framework for Broadcasting and Cable services”

TRAI on 7th May 2022 floated a consultation paper on “Issues related to New Regulatory Framework for Broadcasting and Cable services” for seeking comments of the stakeholders on points/issues which are pending for full implementation of New Regulatory Framework 2020. This paper primarily discussed issues related to

discount given in the formation of the bouquet, ceiling price of channels for inclusion in bouquet, and discount offered by broadcasters to DPOs in addition to distribution fee.

- iii Consultation Paper dated 9th June 2022 on “Spectrum Requirements of National Capital Region Transport Corporation (NCRTC) for Train Control System for RRTS Corridors”

Department of Telecommunication (DoT) through their letter dated 29th November 2021 informed TRAI that National Capital Region Transport Corporation (NCRTC) has requested DoT for allotment of spectrum for Train Control System for Regional Rapid Transit System (RRTS) being implemented by NCRTC in 8 rail corridors including 3 rail corridors of approximate length of 350 Km along Delhi – Ghaziabad – Meerut, Delhi – Gurugram – Alwar, Delhi – Panipat in Phase-I.

In this background, DoT requested TRAI to provide

- a) Recommendations on administrative assignment of spectrum to NCRTC and the quantum, pricing / charging thereof and any other terms and conditions, for separate spectrum requirements of NCRTC in 700 MHz band.
- b) Any other recommendations deemed fit for the purpose, including assignment of the same spectrum for other RRTS / Metro rail network pan-India.

In this regard, a Consultation Paper on “Spectrum Requirements of National Capital Region Transport Corporation (NCRTC) for Train Control System for RRTS Corridors”, was released on 9th June 2022 seeking inputs from the stakeholders have been placed on TRAI’s website (www.traai.gov.in). In this consultation paper specific issues have been raised for consideration of stakeholders on the above-mentioned issues.

- iv Consultation Paper dated 20th July 2022 on “Renewal of Multi-System Operators (MSOs) Registration”

Digitalization of the Indian broadcasting sector began in year 2012 and was completed across the country by March 2017. Ministry of Information & Broadcasting (MIB) issued first of new registrations to Multi System Operators (MSOs) during the DAS implementation in June 2012, which becomes due for renewal/extension in June 2022. The Cable Television Networks Rules, 1994, however, do not mention provision about renewal of MSO registrations.

In view of this, on 7th February 2022, the Authority received a reference from MIB seeking recommendations on the issues pertaining to MSO Renewal procedure.

Accordingly, on 20th July 2022, released a consultation Paper on “Renewal of Multi-System Operators (MSOs) Registration”. The Consultation paper sought comments of the stakeholders on the relevant issues pertaining to renewal of MSO registration including the quantum of fee to be paid for such renewal.

v Consultation Paper dated 21st July 2022 on “Issues related to Community Radio Stations”

Community Radio Stations (CRS) serve a local and well-defined community focusing on the day-to-day concerns of its audience and satisfy their specific information and entertainment needs. The Government announced its policy for the grant of permission for setting up of CRS in December 2002 permitting well established educational institutions, including IITs/IIMs to establish CRS. In order to allow greater participation by the civil society on issues relating to development and social change, the Government on 4th December 2006 announced a revised policy for CRS that has been duly amended in 2017.

MIB vide its references dated 11th November 2021 and 17th January 2022 requested the Authority to provide its recommendations, under section 11(1)(a)(ii) and 11(1)(d) of the TRAI Act, 1997 on the following issues:

- a) Inclusion of not-for-profit companies, registered under Section 8 of Companies Act 2013, in the list of eligible organizations.
- b) Increasing of permission period from existing period of 5 years to 10 years.
- c) Maximum duration of advertisement per hour of broadcast on CRS.
- d) Number of CR Stations operated in each district of operation by Not-for-profit organizations, operating in multiple districts.

Accordingly, on 21st July 2022, the Authority released a consultation paper on “Issues related to Community Radio Stations” wherein comments/views of the stakeholders were sought on the issues related to CRS.

vi Consultation Paper dated 25th July 2022 on “Embedded SIMs for M2M Communications”

Department of Telecommunication (DoT) through their letter dated 9th November 2021 have sought TRAI’s recommendations, under TRAI Act, 1997, for holistic deployment of e-SIM in Indian Telecom network including implementation mechanism under different profile – configurations and switch over of profiles by TSPs.

In this regard, a Consultation Paper on “Embedded SIM for M2M Communications” was released on 25th July 2022 seeking inputs from the stakeholders. In this consultation paper, issues pertaining to holistic deployment of eUICC (Embedded Universal Integrated Circuit Card) in Indian Telecom network including implementation mechanism under different profile configurations and switch over of profiles by TSPs have been raised, for consideration and comments of stakeholders.

vii Consultation Paper dated 26th July 2022 on “Rationalization of Entry Fee and Bank Guarantees”

The Department of Telecommunications (DoT), through its letter dated 3rd March

2022 informed TRAI that as per the current Unified License (UL)/ Unified License (Virtual Network Operators) regime, there is a provision of different Entry Fee and two separate bank guarantees (BGs) i.e., Financial Bank Guarantee (FBG) and Performance Bank Guarantee (PBG). Further, DoT through its afore-mentioned letter dated 3rd March 2022, informed TRAI of its view that:

- a) Entry Fee should be reduced and made uniform across all authorizations.
- b) Both bank guarantees should be merged and amount of a single BG may be prescribed for each authorization.

Accordingly, under the terms of clause 11 (1)(a) of TRAI Act, 1997, TRAI has been requested to give its recommendations on the issue.

The Authority notes in this context that in the letters issued in October, 2021, DoT informed holders of Unified Access Service licenses, Unified License (UL), Unified License (Virtual Network Operators)(UL(VNO)), National Long Distance, International Long Distance, Public Mobile Radio Trunking Service, Captive Mobile Radio Trunking Service, and Voicemail/Audiotex/ Unified Messaging Service licenses/ authorizations that amendments had been carried out to the licenses reducing the amount of bank guarantees to 20% of the existing levels. This reduction by 80% in the levels of BGs was done pursuant to the telecom reforms announced by the Government on 15th September, 2021.

Accordingly, TRAI on 26th July 2022 issued this Consultation Paper to solicit the comments of stakeholders before finalizing recommendations on the rationalization of the Entry Fee, merger of bank guarantees, and prescribing a single amount of BG for different authorizations/licenses/registrations/permissions.

- viii Consultation Paper dated 5th August 2022 on “Leveraging Artificial Intelligence and Big Data in Telecommunication Sector”

The Authority released a consultation paper on “Leveraging Artificial Intelligence and Big Data in Telecommunication Sector” on 5th August 2022. This consultation paper deliberates on following issues:

- a) The aspects of AI and BD referred by the DoT for seeking recommendations from TRAI mainly focusses on the telecom sector.
- b) The scope of the consultation paper is to seek comments from stakeholders on the aspects referred to by the DoT and also to seek comments on various other aspects where the telecom sector can play an important role to leverage AI and BD in other sectors.
- c) The adoption of AI and BD in telecom sector has improved network reliability and customer experience, optimized cost of operations, generated new revenue and taken strategic business decisions and much more. With Big Data Analytics, AI can drive more value from the network data to train and

test its models to initiate actions and decisions in the network. BD is a key element of AI in building AI based capacity and capabilities.

- d) to interact with the industry experts, telecom service providers and leading solution providers to understand AI and BD from telecom's perspective, learn about use cases of AI and BD in telecom sector and global view of network insights with AI and BD.
 - e) how future networks shall incorporate AI at various levels to make telecom networks as a cross-sectoral hub for flow of information.
 - f) leveraging AI and BD in the telecom sector and its support to other sectors for exploiting features of AI and BD.
 - g) to explore new possibilities that might be useful for promotions and expansions of AI based systems in the respective sectors.
- ix Draft Telecommunication (Broadcasting and Cable) Services Interconnection (Addressable Systems) (Fourth Amendment) Regulations, 2022 dated 9th September 2022

TRAI had notified the Telecommunication (Broadcasting & cable) Services Interconnection (Addressable System) Regulation, 2017 on 3rd March 2017 ([hereinafter referred to as Interconnection Regulations]. Its Amendment (1st amendment) was notified by the Authority on 30th October 2019.

During the consultation undertaken to prepare the Audit Manual certain comments and observations were made on reflect some issues in the Schedule III of the Interconnection Regulations.

Accordingly, Draft Telecommunication (Broadcasting and Cable) Services Interconnection (Addressable Systems) (Amendment) Regulations, 2019 was issued on 27th August 2019 which included issues related to Digital Rights Management Systems.

The Schedule III of the Interconnection Regulations does not provide for the requirements /specifications of DRM based systems. The Authority, during its consultations on Audit manual, received the feedback that owing to its benefits the IPTV based DPOs are switching to DRM technology. It is necessary that the Audit regime covers the DRM based networks and provides for enabling provisions for such operators. Accordingly, Draft Regulations dated 27th August 2019 mentioned above, included DRM specifications in Schedule III.

During the consultation process, the Authority received numerous comments and suggestions from various stakeholders on this issue. Numerous modification/additions were proposed by several stakeholders. Hence, the Authority was of the opinion that system requirements for DRM shall be dealt with in a separate consultation paper.

The Authority was of the view that on the issue related to “System Requirements for Digital Right Management System”, extensive deliberations with industry stakeholders is required. Accordingly, the Authority constituted a committee comprising of industry stakeholders to prepare and submit draft ‘System Requirement for Digital Right Management (DRM)’ to the Authority. After extensive deliberations, the committee submitted a report on “System requirement for Digital Right Management (DRM)” to be included in Schedule III of the Interconnection Regulation to the Authority.

Accordingly, TRAI issued this Draft Telecommunication (Broadcasting and Cable) Services Interconnection (Addressable Systems) (Fourth Amendment) Regulations, 2022 on 9th September 2022.

6.1.4 Tariff Orders

- i Telecommunication Tariff (Sixty Eighth Amendment) Order, 2022 dated 7th April 2022

The Authority notified the Telecommunication Tariff (Sixty Eighth Amendment) Order, 2022 on 7th April 2022. The tariff order prescribes ‘Nil’ charge per session for the Unstructured Supplementary Service Data (USSD)-based mobile banking and payment services.

In order to protect the interests of the USSD users and to promote digital financial inclusion, rationalization of USSD charges was required. The Authority was of the view that imposing no charge for USSD service could have a positive impact on number of USSD transactions, which would be a significant step towards achieving digital financial inclusion. Therefore, the Authority after following the consultation process, decided to do away with the charges prescribed for USSD for mobile banking and payment service, while keeping the remaining aspects unchanged.

- ii The Telecommunication (Broadcasting and Cable) Services Interconnection (Addressable Systems) (Fourth Amendment) Regulations, 2022 dated 22nd November 2022

The Authority on 22nd November 2022 issued the Telecommunication (Broadcasting and Cable) Services (Eighth) (Addressable Systems) Tariff (Third Amendment) Order, 2022 and the Telecommunication (Broadcasting and Cable) Services Interconnection (Addressable Systems) (Fourth Amendment) Regulations, 2022.

In consonance with the complete digitization of the cable TV sector, TRAI on 3rd March 2017 notified the ‘New Regulatory Framework’ for Broadcasting and Cable Services. After passing legal scrutiny in Hon’ble Madras High Court and Hon’ble Supreme Court, the new framework came into effect from 29th December 2018. As the New Regulatory Framework changed quite a few business rules, many positives emerged. However, upon implementation of the New Regulatory Framework 2017, TRAI noticed some inadequacies impacting the consumers. To address certain issues that arose after implementation of new regulatory framework, after due

consultation process with stakeholders, TRAI on 1st January 2020 notified the New Regulatory Framework 2020.

Some stakeholders challenged provisions of Tariff Amendment Order 2020, Interconnection Amendment Regulations 2020 and QoS Amendment Regulations 2020 in various High Courts including in the Hon'ble High Court of Bombay and Kerala. Hon'ble High Courts upheld the validity of New Regulatory Framework 2020 except for a few provisions.

TRAI in the present amendments, addressed only those critical issues suggested by the stakeholders' Committee to avoid inconvenience to consumers while implementing the Tariff Amendment Order 2020. The Stakeholders' Committee also listed other issues for subsequent consideration by TRAI. In addition, the Authority held multiple meetings with representatives of LCOs including an online meeting which was attended by more than 200 LCOs from across the country. Several issues were put forward during these meetings and TRAI noted the suggestions and may take further suitable measures if the situation warrants.

6.1.5 Others

i Pilot projects for use of street furniture for small cells and aerial fiber deployment

Small cells will play a pivotal role in network up-gradation and expansion of 5G small cell network. For 5G, higher frequency bands will be used to achieve high speed data downloads. However, use of higher frequency bands for 5G rollout will have the shorter coverage as signals in these bands cannot travel through buildings or obstacles. Therefore, the macro cells will be required to be complemented with extensive deployment of small cells so as to support all kinds of uses and applications, at all locations. Even in cases where coverage is not an issue, small cells can be used for traffic offloading since the carrying capacity of lower frequencies, used by macro radio sites, are limited.

Use of Street furniture already available at these places like poles etc. can be used for mounting these 5G Small Cells, obviating the need for erecting thousands of new towers. This will not only ensure faster deployment of 5G but also unlock true potential of underutilized street furniture at these critical places. Availability of existing street furniture in form of millions of streetlights, thousands of bus stops, hundreds of metro pillars can be a boon for economical and fast deployment of small cells. However, the deployment of small cells and aerial fibre on street furniture were likely to face many issues like identifying the suitable street furniture based on availability of backhaul, power, capabilities of street furniture for mounting suitable equipment, scalability, and concerns related to local approval, and safety. The right of way procedure, sharing of the street furniture amongst various users, permissions needed for power supply under state electricity laws, exemptions or bulk permissions for small cell deployment will also be required to be addressed.

Thus, with the objectives of developing cross sectoral framework which promotes sharing of street furniture infrastructure among various central, state and municipal authorities to develop state of the art 5G network, TRAI had initiated pilots at Bhopal Smart City, GMR International Airport New Delhi, Deendayal Port Kandla and Namma Metro Bengaluru on use of street furniture for Small Cells and aerial fibre deployment. The four pilots that were initiated in March 2022 have been completed successfully in the stipulated time frame. COAI, all Telecom service providers, participating administrative authorities, and all the working group members worked continuously, aiding and ensuring the effective and timely completion of the pilots. Extensive and proactive cooperation extended by Dept. of Telecommunications was one of the primary force behind huge success of these pilots. It is expected that learnings from the pilots, would be helpful in bringing together various industry and administrative stakeholders to develop consensus and strengthen the industry understanding of how these deployment practices can be used to enable proliferation of 5G small cells.

ii Reporting Automation

TRAI has created a data collection portal for TSPs to report various data. This portal enables all stakeholders to submit data online. The portal provides automated data collection, validation, processing and reports generation (using Tableau) for various divisions of TRAI. The data reporting portal has ceased the manual practice of data submission through emails/physical letters.

iii Administrative Automation

Human resources information system maintains database of employees including their personal and professional (career) details. The availability of such system with an online and updated database makes easy for government departments to automate day to day activities like maintaining personal files, leave management, reimbursements, advances, tours etc., much more efficiently and correctly. Now, TRAI has implemented e-Human Resource Management System (e-HRMS) developed by NIC.

iv Collaborative Work Automation

To promote collaborative work, TRAI has introduced CollabFiles, a solution developed by NIC. It is a platform to connect, create, share and collaborate on Office Documents in a secured environment. The CollabFiles platform is integrated with NIC email & Sandes (the messaging app of Govt. of India). The major feature of CollabFiles include Create and Manage Files & Folders, Tag files with meaningful keywords, Multiple Search facilities to locate files, Create and Manage mail/phone Address book, Share and Collaborate on Documents & Spreadsheets.

v TRAI Recommendation Status Portal (TRSP)

The Authority from time to time makes recommendations to the Government of India for Telecom and Broadcasting Sector. With an objective to create central repository for real-time tracking of status of all recommendations, TRAI has developed

Recommendation Status Portal last year. This portal has now facilitated TRAI and DoT/MIB (Department of Telecommunication/Ministry of Broadcasting) to track the status of all recommendations made by TRAI. The implementation/action taken/back references by the Government of India on such recommendations is being updated by respective department time to time and can be easily viewed/tracked through this online portal.

vi Portal for Exemption from SMS Termination Charges

To disseminate various G2C information, government entities send transactional SMS to consumers, through alphanumeric headers. TRAI has earlier developed a portal for facilitating all government entities, who wish to have exemption from SMS termination charges of up to 5 paisa for sending transactional SMS. Through portal the entities can apply fresh or for renewal of exemption and know other related information.

Now, the data APIs has been integrated in the portal to directly fetch details of header registered in TSPs DLT system. Also, whenever a header has been granted exemption by TRAI, the details are communicated to the TSPs, through data APIs, for configuration in their billing system. As on date total 895 headers have been approved by the Authority from SMS termination charges.

vii Header Information Portal

When consumers receive transactional SMS sent through alphanumeric headers, they may wish to know the details of entity who has sent the SMS. To facilitate consumers, TRAI has earlier developed Header Information Portal where sender details can be seen. This portal also helps other principal entities to check whether any look-alike header is registered by any other entity. Anyone can query a particular header or download the complete list. Service Providers upload the list of alphanumeric headers assigned to Principal Entities (Business or legal entities).

Now, data APIs has been integrated in the portal to fetch the details of headers directly from Service Providers system (including DLT). Header details of total 613992 unique headers, uploaded by service providers, is available on the portal.

viii Other administrative initiatives

a) Permanent Office Building of TRAI

Since its inception in 1997, TRAI has been operating from rented premises. Presently, TRAI's office is situated in a building owned by MTNL on rental basis. The Authority has been approaching the Government regularly for owning the office premises as TRAI is an eligible office for office accommodation from Government pool. Government of India (GoI) through Department of Telecommunication (DoT) has approved the proposal for procurement of built-up Office Space for TRAI in upcoming World Trade Centre (WTC), Nauroji Nagar, New Delhi. TRAI has been allotted an area of 1,15,982 Sq. Ft. in the project under construction and is expected to shift to

its own building tentatively by second half of 2023.

b) Anticipated Achievements for 1st January 2023 to 31st March 2023

- 1) Recommendations on “Issues relating to Media Ownership”
- 2) Amendment to the Telecommunication (Broadcasting and Cable) Services (Eighth) (Addressable Systems) Tariff Order, 2017
- 3) Recommendations on “Issues related to Community Radio Stations”
- 4) Recommendations on “Renewal of Multi-System Operators (MSOs) Registration”
- 5) Recommendations on “Promoting Local Manufacturing in the Television Broadcasting Sector”
- 6) Amendment to the Telecommunication (Broadcasting and Cable) Services Digital Addressable Systems Audit Manual, 2019
- 7) Recommendation on “Ease of Doing Business in Telecom & Broadcasting sector”
- 8) Recommendations on “Rationalization of Entry Fees and Bank Guarantee”
- 9) Recommendations on “Review of AGR Definition”
- 10) Consultation Paper on “DTH Policy matters w.r.t. AGR, BG & level playing field”
- 11) Consultation paper on “Review of guidelines for FM radio broadcasting services through private agencies (Phase - III)”
- 12) Consultation paper on the “need and timing for introduction of new service provider”
- 13) Tariff issues related to Cell broadcast alerts through Common Alert Portal (CAP) during disasters/non-disasters.
- 14) Consumer Survey in r/o tariff of Telecommunication services and related issues.
- 15) Audit of TSPs to ascertain implementation of prohibition of MNP specific offers.
- 16) Recommendations on Promoting Networking and Telecom Equipment Manufacturing in India
- 17) Recommendations on “Use of Street Furniture for Small Cell and Aerial Fiber Deployment”
- 18) Review of Metering and Billing Audit Regulation and Guidelines
- 19) Review of the existing Regulations/Tariff orders / Directions

- 20) The Revision of Old Regulation (i.e. Broadband Quality of Service Regulation) is in process & draft consultation paper for revision of regulation is being prepared.
- 21) Recommendation for improving QoS in ratings of buildings
- 22) Comprehensive Review of Regulatory Framework for Broadcasting and Cable Services.
- 23) Recommendations on National Capital Region Transport Corporation (NCRTC) for train control system for RRTS Corridors.

6.2 TELECOM DISPUTES SETTLEMENT AND APPELLATE TRIBUNAL

The Telecom Regulatory Authority of India (TRAI) Act, 1997 (as amended up to date) provides for the establishment of the Telecom Disputes Settlement and Appellate Tribunal (TDSAT) to regulate the telecommunication services, adjudicate disputes, and to act as appellate body under TRAI and other acts with the purpose to protect the interests of service providers and consumers of the Telecom, Broadcasting & Cable sector and to promote and ensure orderly growth of the Telecom, Broadcasting & Cable sectors and for matters connected therewith or incidental thereto. TDSAT was initially created with the purpose for speedy settlement and adjudication of disputes in telecom and broadcasting sectors. The jurisdiction of TDSAT has since then been expanded to exercise the jurisdiction, powers and authority conferred on the Appellate Tribunal by or under the Information Technology Act, 2000 and The Airport Economic Regulatory Authority of India Act, 2008 and the Aadhar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act 2016.

The TDSAT was created in the year 2000 by the Central Government under the TRAI Act, 1997 (as amended up to date) to settle and adjudicate disputes involving licensor, licensee, and a group of consumers. In January, 2004 the jurisdiction of TDSAT was extended to include broadcasting and cable services besides telecommunication services. In May, 2017 the jurisdiction of TDSAT was further extended to include jurisdiction of Airport Economic Regulatory Authority Appellate Tribunal under the Airport Economic Regulatory Authority of India Act and as Cyber Appellate Tribunal (CyAT) under the I.T.Act.

The jurisdiction of TDSAT is exclusive and an appeal against its order lies to the Hon'ble Supreme Court of India on points of law only. However, under the provisions of IT Act, appeal against order of TDSAT on cyber appeals lie before High Court. Statutory appeal does not lie against the interim order of TDSAT. TDSAT exercises both original as well as appellate jurisdiction. TDSAT is an expert body and comprises of a Chairperson, and two Members. Hon'ble Mr Justice D.N.Patel is the Chairperson, Hon'ble Sri S.K.Gupta and Hon'ble Mr Justice R.K Gautam are Members.

The TDSAT has also set up a Registrar's Court which has started functioning w.e.f. 22.7.2013 for completion of pleadings, framing of issues and recording evidence etc. to speed up the disposal of cases before the bench of TDSAT.

TDSAT formulated its own Procedure (TDSAT Procedures 2005) based on the principles of natural justice. World over, the disputes in telecom and broadcasting sectors are resolved by the regulator or normal courts. However, in India, a unique Institution in the form of TDSAT exists for speedy settlement

and adjudication of disputes in telecom and broadcasting sectors. Indian model for resolution of disputes has been seen with great interest by various telecom regulators across the world.

As sector Member of International Telecommunication Union (ITU), TDSAT has been participating in the international seminars, conferences and events organized by ITU and other international bodies. Officers/ Officials of TDSAT from time to time, are being deputed to participate in Training programmes organized by different central government organizations.

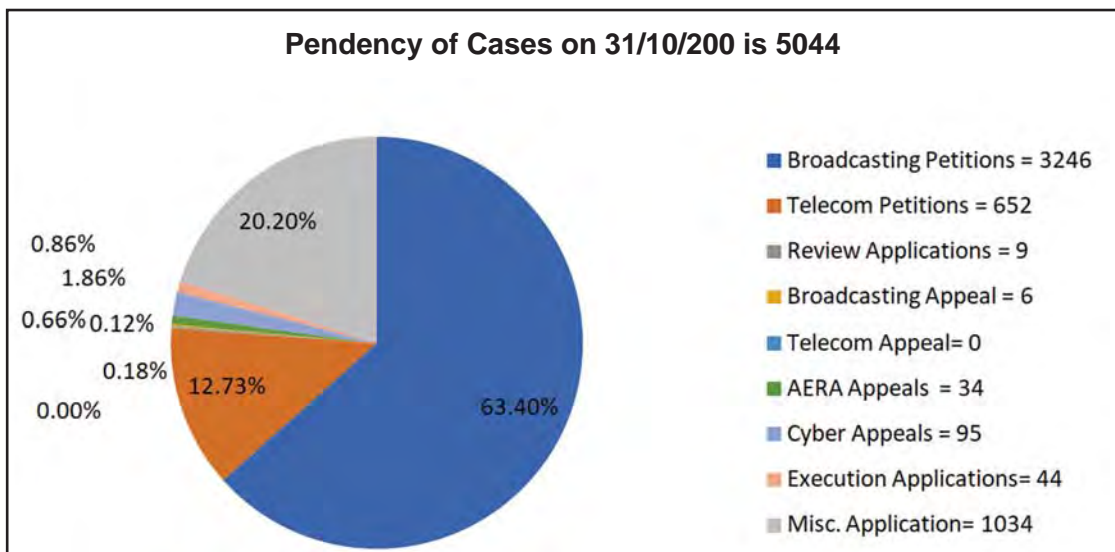
In telecom sector various types of matters relating to interconnection, inter-operator billing disputes, customer application form (CAF), certain policy and regulatory actions failing to address legitimate expectations of stakeholders, recovery of outstanding dues of stakeholders, licensing disputes including disputes on computation of Adjusted Gross Revenue (AGR) and allocation of spectrum, disputes on access deficit charge (ADC) etc., can be filed in TDSAT.

In Broadcasting and Cable sector, cases relating to signal disconnection/ refusal/denial, pricing of channels/ bouquets, non-payment/ recovery of subscription/carriage charges, piracy of signals/ illegal transmission of signals, licensing disputes, disputes arising out of tariff order of the TRAI etc., can be filed before TDSAT.

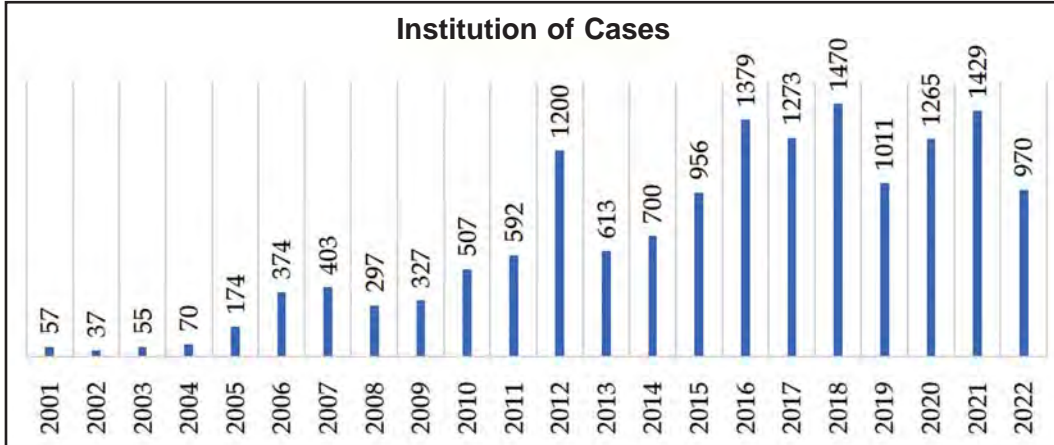
In Airport sector, the tariff orders passed by the Airport Economic Regulatory Authority of India and being challenged before TDSAT by various stakeholders.

In IT sector, orders of the Adjudicating officer regarding claim for injury damage upto Rs. 5.00 crores and being challenged before TDSAT.

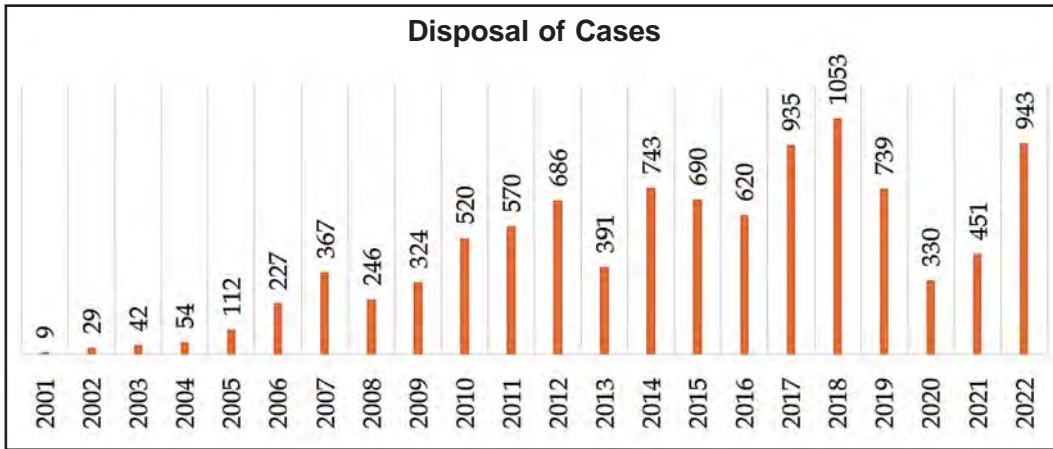
The number of cases in the Tribunal has been increasing every year since its establishment in May, 2000.



The total number of cases filed before TDSAT in the Year 2001 was 57 (including Petition/ Appeal/ E.A./R.A.), which increased to 970 cases in 2022 (Excluding M.A.) till 31.10.2022. Total cases pending before the Tribunal on 31.10.2022 is 5044 (including 958 miscellaneous applications).

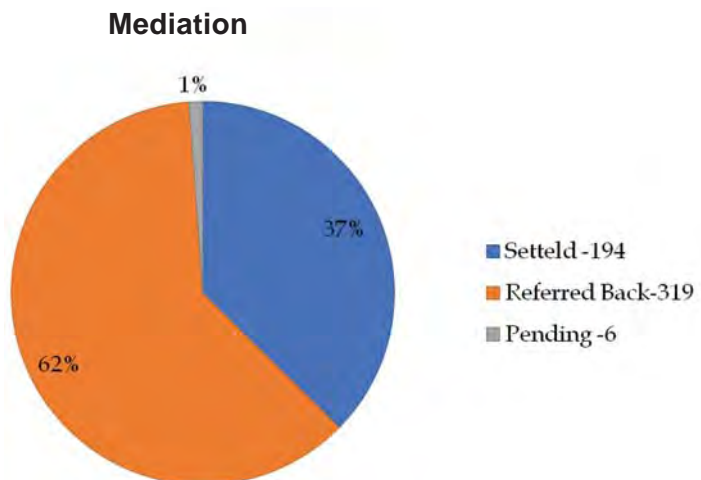


The disposal of cases has kept pace with the filing and all efforts are made to ensure that there is speedy disposal. All together 943 cases have been disposed off in the year 2022. So far since its constitution TDSAT has disposed off 10115 cases out of the total 15159 cases filed before it.



TDSAT maintains its own website with all judgments, orders and other information relating to the tribunal uploaded on its website at <https://www.tdsat.gov.in>.

With the purpose of providing speedy justice ADR mechanism has been promptly adopted by the TDSAT and it has also set up a full-fledged Mediation Centre to help litigants go through a mediation process and arrive at a mutually agreed settlement of disputes with the help of trained mediator. The Mediation Centre has started functioning from 29.07.2013 and has been successful in helping settle large number of cases so far. As on 31.10.2022 a total number of 519 cases have been referred to Mediation Centre.



Out of this, a total number of 194 cases have been settled and 319 numbers of cases were referred back to the Tribunal unsettled. The remaining 6 cases are currently under mediation.

CHAPTER 7
ADMINISTRATION, TRAINING AND
SWACHH BHARAT

CHAPTER 7

ADMINISTRATION, TRAINING AND SWACHH BHARAT

7.1 RIGHT TO INFORMATION

7.1.1. The Department of Telecommunication (DoT) has been implementing the Right to Information Act (RTI), 2005 since its inception. An RTI Cell has been established in the Department for receiving RTI Applications/Appeals for entire Department and forwarding the same to the concerned CPIOs/FAAs of the Department and transferring to other Public Authorities.

7.1.2. DoT and its Attached/Subordinate Offices/Societies are separate Public Authorities in terms of Section 2(h) of RTI Act, 2005. Each of these Public authorities has its own Central Public Information Officer (CPIOs) / Appellate Authorities (AAs). For any information relating to these organisations' applications need to be submitted to the concerned Public Authorities as per provisions of RTI Act, 2005. All Public Authorities have also hosted relevant inputs/ documents on their respective websites, as required under Section 4 of the RTI Act. The relevant contents are reviewed and updated periodically by the concerned Public Authorities.

7.1.3 The Department has also conducted a third-party audit of the proactive disclosure under RTI Act, 2005 for the financial year 2021-22 through the National Institute of Communication Finance (NICF), a designated Training Institute under DoT.

7.1.4 The facility of receiving and processing RTI applications/appeals online through the RTI Web-Portal of Department of Personnel & Training, has been started in the Department on 23.08.2013. This is strengthening the system of quick disposal and monitoring of RTI applications and appeals. All PSUs under the department have also made Online portal.

7.1.5 To facilitate the quick disposal of RTI applications/appeals, 116 CPIOs and 66 First Appellate Authorities are functioning in DoT. The details of RTI Applications/Appeals received and disposed of as on 16.01.2023 are as below: -

	Total RTI applications Received	Total RTI applications disposed
Online	2085	1967
Offline	274	274

	Total RTI appeals Received	Total RTI appeals disposed
Online	141	119
Offline	08	08

7.2 PUBLIC GRIEVANCE

7.2.1 Function & Role:

The function and roles assigned to Public Grievance (PG) Wing of DoT includes:

- i. Handling of Public Grievances through Centralized Public Grievance Redressal and Monitoring System (CPGRAMS);
- ii. Management of Telecom Consumer Grievance Helpline (Short Code-1063);
- iii. Dealing with grievances registered on telephone / fax / posts / by hand, etc.;
- iv. Citizen's Charter for DoT;
- v. Arbitration matters;
- vi. Parliament Questions, fulfillment of Assurances, Court Cases, RTI Matters, audit paras and administrative matters related to PG Cell;
- vii. Handling of VIP and PMO references;
- viii. Handling of grievances received from higher authorities / offices;
- ix. Create awareness amongst the stakeholders, organize workshop/training and inspect subordinate office for better resolution of customer grievances;
- x. Coordinate with other Ministries/ Departments related to PG.

7.2.2 Grievance Redressal Mechanism in Telecom Sector:

- i The primary responsibility of addressing the service related, billing, quality of service grievances lies with TSP, which emanates from licensing terms and conditions. As per licensing conditions;

“Any dispute, with regard to the provision of SERVICE shall be a matter only between the aggrieved party and the LICENSEE, who shall duly notify this to all before providing the SERVICE. And in no case the LICENSOR shall bear any liability or responsibility in the matter. The Licensee shall keep the Licensor indemnified for all claims, cost, charges or damages in the matter.”
- ii TRAI has issued “Telecom Complaint Redressal Regulations 2012” (available on TRAI website, www.trai.gov.in) to streamline the process of grievance redressal mechanism by the service providers. The regulation provides for setting up of two-tier grievance redressal mechanism by all TSPs as per following details:
 - a) Establishment of a Complaint Centre with a toll-free “Customer Care Number”. The Complaint Centre will be responsible to address all the complaints received by them. Provisions have also to be made such that Customer Care Number of TSPs could be accessed from any other service provider’s network. Every complaint at the Complaint Center shall be registered by giving a unique docket number.

- b) Establishment of an Appellate Authority: Every service provider shall appoint appellate authorities consisting one or more persons to deal with grievances. If a consumer is not satisfied with the redressal of his complaint, or his complaint remains unaddressed or no intimation of redressal of the complaint is received within the specified period, he can approach the Appellate Authority for redressal of his complaints within 30 days. Every service provider shall constitute a two-member Advisory Committee in each of the service areas to advise on all such appeals to the Appellate Authority. The Appellate authorities shall dispose of the grievance, by taking recommendations of the advisory committee into consideration, within 39 days of receipt of the grievance.

Thus, the responsibility of redressal of grievances in the telecom sector lies with the concerned TSPs/ Internet Service Providers (ISPs), organizations/ subordinate units / PSUs / administrative sections. A complainant may approach to PG wing of DoT after exhausting the channels of redressal of grievance at concerned Organization / service provider level.

However, PG Wing of DoT, without prejudice to the right of a complainant to approach an appropriate court of law, acts as a facilitator for resolution of grievances so received. PG wing of DoT acts as next higher level in the grievance redressal mechanism. PG wing attempts to resolve the grievance by coordinating with all the concerned stake holders including TSPs/ISPs, and other concerned agencies in time bound manner to the satisfaction of the complainants.

7.2.3 Grievance can be lodged to PG Wing of DoT through the following means:

- i By Post: Public Grievances Cell, Department of Telecommunications, 6th Floor, Mahanagar Door Sanchar Bhawan, Old Minto Road, J. L. Nehru Marg, New Delhi – 110002.
- ii By hand: Information & Facilitation Counter, Sanchar Bhawan, 20, Ashoka Road, New Delhi- 110001.
- iii Through Fax: FAX No. 011-23232244
- iv Through Phone: Phone No. 011-23221166, 1063 (Toll Free)
- v Through Web Portal: www.pgportal.gov.in

7.2.4 Centralized Public Grievance Redress and Monitoring System (CPGRAMS)

- i CPGRAMS is the platform based on web technology which primarily aims to enable submission of grievances by the aggrieved citizens from anywhere and anytime (24x7) basis to Ministries/Departments/Organizations who scrutinize and take action for speedy and satisfactory redressal of these grievances. Tracking of grievances is also facilitated on this portal through the system generated unique registration number.

- ii DoT is processing grievances registered by citizens on the CPGRAMS Portal, which includes complaints received in Department of Administrative Reforms & Public Grievance (DARPG), Directorate of Public Grievances (DPG), Department of Pension & Pensioner's Welfare (DoPPW), President's Secretariat and Prime Minister's Office in the system and accessible at the website www.pgportal.gov.in. DoT wings, DoT LSAs, DoT PSUs, TSPs, ISPs etc. have been created as subordinate organizations for online handling of grievances.
- iii Grievances received in the PG wing through various offline modes are also uploaded on the CPGRAMS Portal for online monitoring and tracking.
- iv The details in respect of complaints handled for the year 2022-23 (from 01st April 2022 to 15th November 2022) are given as under: -

Opening Balance as on 1 st April, 2022	No. of grievances booked during 1 st April, 2022 to 15 th November, 2022	Total	No. of grievances disposed of during 1 st April, 2022 to 15 th November, 2022	Pending grievances as on November 2022
687	33676	34363	33306	1057

- v In January 2021, Appeal module has been made operational in CPGRAMS portal, whereby the complainant can file an appeal on CPGRAMS Portal if it is not satisfied with the redressal / reply of the grievance. DoT is processing Appeals registered by citizens in the CPGRAMS Portal.
- vi The details in respect of appeals handled for the year 2022-23 (from 01st April 2022 to 15th November 2022) are given as under: -

Opening Balance as on 1 st April, 2022	No. of grievances booked during 1 st April, 2022 to 15 th November, 2022	Total	No. of grievances disposed of during 1 st April, 2022 to 15 th November, 2022	Pending grievances as on November 2022
53	9859	9912	9819	93

7.2.5 VIP/PMO references

On receipt of references through the higher offices, these are uploaded on CPGRAMS portal and forwarded to concerned Division of DoT for handling and disposal. The progress is monitored on daily basis and update the status related to final reply submitted against these references. Regular meetings are held with the respective DoT divisions for timely disposal of VIP/PMO references. Besides meetings, various divisions of DoT are regularly reminded through letters/ emails about

the pendency of VIP reference and are requested to dispose of these references in a time bound manner.

The guidelines for handling and disposal of VIP references as received from DARPG are forwarded from time to time to all concerned divisions/wings of DoT. It has been stipulated in these guidelines that “the communications received from Members of Parliament should be attended to promptly and acknowledged within 15 days, followed by a reply within the next 15 days. In cases where delay is anticipated, an interim reply should be given indicating the possible date of reply.”

The details in respect of VIP & PMO references handled for the year 2022-23 (from 01st April 2022 to 15th November 2022) are given as under: -

Reference	Opening Balance as on 1 st April, 2022	No. of references booked during 1 st April, 2022 to 15 th November, 2022	Total	No. of references disposed of during 1 st April, 2022 to 15 th November, 2022	Pending references as on 15 th November 2022
VIP 33	200	233	175	58	
PMO 3	12	15	14	01	

7.2.6 Efforts taken for faster disposal of Public Grievances/ VIP cases:

Regular review meetings are conducted with Nodal officers of TSPs and concerned DoT units in order to ensure early disposal of pending grievances/ VIP cases. In these meetings the issues related to categorization of complaints, the disposal mechanism, quality of disposal, systemic issues etc. are deliberated and resolved. Necessary support and handholding to the concerned agency in handling and disposal of the grievances/references is provided. Focusing on ensuring a robust grievance redressal mechanism in TSPs as per TRAI regulations is also laid.

A mechanism has been adopted of continuous persuasion by way of requesting the concerned Units (TSPs/ISPs/ DoT Units) to dispose of pending cases. Letters, emails and telephonic reminders are issued by different levels to the Nodal and higher officers of TSPs/ISPs and DoT units at regular intervals. The task of deep category-wise analysis of pending cases in order to help the concerned units/TSPs /ISPs/Divisions for faster disposal of pending cases and to bring systematic improvements in handling and disposal of grievances is being.

A Special Campaign 2.0 from 2nd October to 31st October 2022 was launched in DoT to ensure expeditious disposal of Public Grievances, Appeals, reference from MPs and State Governments etc. During the campaign, 952 PG grievances, 78 Appeals and 32 MPs / State Governments references, which were booked upto 26th September 2022, were disposed of 100% of the targets of disposal of PG and Appeal cases during the special campaign were achieved.

7.3 CO-ORDINATION AND MONITORING OF COURT CASES OF DOT

Legal Cell:

- i Co-ordination and monitoring of Court Cases.

- ii Implementation of Legal Information Management and Briefing System (LIMBS) in DoT for online monitoring of Court Cases.
- iii Issuance of instructions regarding handling of Court Cases.
- iv Instruction relating to Court Cases received from Department of Legal Affairs, DoPT, Cabinet Secretariat, PMO etc. are circulated by Legal Cell to all wings/divisions in the Department for necessary action.
- v References received from Circles/Field Units/Division of DoT (HQ) relating to Court cases pending before various High Courts/Tribunals including Supreme Court of India- are examined and forwarded to concerned wing/divisions in the Department.
- vi Miscellaneous court receipts/notices/documents received from various HCs/ Tribunals including Supreme Court of India-such matters are examined and forwarded to concerned wings/divisions in DoT.
- vii Coordinate meetings on pendency of court cases as and when required by higher authorities / offices.

During the current year, all wings/divisions of DoT were asked to update the details of court cases in new version of LIMBS portal.

Status of Court Cases entered/updated as on 15.11.2022:

Total Number of Court Cases in LIMBS	4311
Supreme Court	183
High Courts	1298
Tribunal (CAT + TDSAT)	2511
District & Session Court	105
Others :	214

7.4 CITIZEN CHARTER

Citizen Charter is a document which represents the commitment of the Organization towards standard, quality and time frame of service delivery, grievance redressal mechanism, transparency and accountability. The concept of Citizen Charter enshrines the trust between the Government as service provider and general public as customers.

Though not enforceable in a court of law, the Citizen Charter is intended to empower citizens so that they can demand committed standards of service and avail remedies in case of non-compliance by service provider organizations. The basic thrust of the Citizen Charter is to render citizen-centric public services by making them demand driven rather than supply driven.

DoT, with vision to provide secure, reliable, affordable and high quality converged telecommunications services anytime, anywhere for an accelerated and inclusive socio-economic development, has formulated its Citizen Charter listing main services/transactions being delivered by DoT for its

customers.

The nodal unit for citizen charter, coordinates with other wings of DoT to get the services documented along with associated process, which includes details of documents required, applicable fees, if any, along with its mode of payment for availing each of the services. The Charter also specifies the standards of services delivery, the contact details of the units/agencies/centers responsible for delivery of these services, performance evaluation criteria in respect of delivered services, grievance redressal mechanism, etc.

7.5 TRAINING & CAPACITY BUILDING

7.5.1 Capacity Building & Training (CB&T) Division

- i. Capacity Building & Training (CB&T) Division is the nodal division for all training related matters of ITS Gr. 'A', P&T BWS Gr. 'A' and TES Gr. 'B' cadres and entrusted with the work of deputation of ITS officers for domestic short & long-term trainings, coordination of training activities with DoPT and coordination for training activities of National Telecommunications Institute for Policy Research, Innovations & Training (NTIPRIT). CB&T Division is also entrusted the responsibilities to coordinate with DoPT and other departments/Ministries on the various long-term training programmes of ITS and P&T BWS officers, Development of Mid-Career Training Programme policy and planning the MCTP Phase I/II/III for ITS officers, Development and Coordination for in-service courses for DoT officers, Preparation and implementation of Annual Training Plan, Coordination with National/International Training Centres and Institutes Handling of various matters related to iGOT and "Mission Karmyogi" of DoPT.
- ii. In all, 19 officers of the ITS cadre have been deputed and nomination of 3 officers has been proposed to the following long term training programs of DoPT and Ministry of Defence, Ministry of Finance in the current session 2022-23:

S. No.	Name of Programme	Institute	No. of officers nominated
1	78 th Staff course for Civilian Officers at Defence Services Staff College (DSSC)	Wellington (Tamil Nadu)	1
2	2 Years Post Graduation Programme (MBA- Financial Management)	AJNIFM, Faridabad	1
3	48 th Advanced Professional Programme in Public Administration (APPPA)	IIPA New Delhi	5
4	14 th One Year Diploma in Public Policy and Sustainable Development Programme (PP&SD)	TERI School of Advanced Studies New Delhi	6
5	15 th Post Graduate Diploma Programme in Public Policy and Management (15 th PGD-PPM)	MDI, Gurugram	6
6	63 rd NDC Programme	National Defence College, New Delhi	3 (Proposed)

- iii. With an aim to harness the potentials of the DoT officers involved in licensing, monitoring, frequency management and standardization activities related to satellite communication a Capacity Building sharing programme was organized in coordination with Department of Space (DoS). **25 officers** from different units of DoT were nominated to this 5 days Training Programme on Satellite Communications at **SAC Ahmedabad**.
- iv. While the special emphasis has been given on the Digital India initiative and promoting e-Governance, a capacity-building initiative was organized by NeGD aimed towards developing the required competencies and aptitude of the officers to conceptualize and implement meaningful e-Governance projects. 3 Senior officers from DoT were nominated for “**e-Governance Senior Leadership Programme**” which was organized at **IIM Bangalore**.
- v. CB&T Division has also nominated 4 officers from Department of Telecommunication to the 8 days online e-learning course organized by International Telecommunication Union (ITU) on “Wireless Access Technologies to Internet Network”.
- vi. In addition to the above, Capacity Building and Training Division, has also coordinated with the Department of Economic Affairs (DEA) for following short term training programme sponsored by DEA during 2022-23, wherein number of officers from DoT had participated/ nominated (for Trainings in Dec 2022):

S. No.	Name of Programme	Institute	No. of officers nominated
1	Project Finance & Feasibility Study	IIBF, Mumbai	4
2	Public-Private Partnership (PPP)- Basics and design	IIM, Kozhikode	8
3	Fiscal Policy -Macroeconomic Management	IIM, Indore	6
4	Project Structuring & Contractual Bundles, Project Planning & Governance	IIM, Lucknow	2
5	PPP Concepts, Laws & Regulations	AJNIFM, Faridabad	9
6	Project Planning & Scheduling - Overview of PM Gati Shakti	NITIE, Mumbai	6
7	Ownership driven Project Manager – Stakeholder Management	SP Jain, Delhi	8
8	Infrastructure Project Management	ICAI / XLRI, Bhubaneshwar	1
9	Contract design, Bidding process	NLSIU, Bangalore	3
10	Public Private Partnership- Negotiating Strategies & Urban development	IIM, Indore	2
11	Project Management (CBPPM)	IIM, Culcutta	5

- vii. Mid-Career Training Program (MCTP) for ITS officers was started from July 2019. During 2022-23 Total 8 batches of Technical component of MCTP, consisting of 214 officers, have been conducted, and in respect of “Administrative and Managerial component” of MCTP, 4 batches of Management Component consisting 101 officers have been conducted till Nov 2022. Moreover, 70 officers in 2 batches of Technical Component of MCTP have been proposed and nominated.
- viii. In September 2020, Government of India has launched Mission Karmayogi which is a National Programme for Civil Services Capacity Building (NPCSCB). The programme aims at building a future-ready civil servant with the right attitude, skills and knowledge, aligned to the vision of New India. The capacity building will be delivered through iGOT Karmayogi Digital Platform. This platform will act as a launch-pad for the NPCSCB. DDG (CB&T) has been designated as Training Manager of DoT and thus the implementation of “Mission Karmayogi” in DoT is coordinated and monitored by CB&T Division for all units, subordinate offices, attached offices, PSUs (BSNL/MTNL/TCIL/ITI Ltd.) and Autonomous bodies (C-DOT) of Department of Telecommunications. CB&T division has been also been actively engaged and collaborated with Capacity Building Commission for implementation of Mission Karmayogi in DoT.
- ix. A Working Group on “Training Capacity Building and Mission Karmayogi” which had the representations from all cadres of DoT, Training Institutes along with officers of PSUs, TSPs and industry associations, deliberated on Mission Karmayogi and presented it’s finding to Hon’ble MOC and Hon’ble Minister of State for Communications during 2-days DoT Field officer’s conference held on 15th -16th Sept 2022.
- x. Implementation of Mission Karmayogi starts with creation of a dictionary of positions, roles and actives, and documenting their linkage to competencies, which enables Ministries/ Departments/ Organizations (MDO) to build an accurate picture of the relationships and the full list of position, roles, activities and competencies relevant to them. Accordingly, in Department of Telecommunications an Internal FRACing Unit (IFU) under the chairpersonship of Secretary (T) has been constituted and 3 FRACing Implementation Teams (FIT) have been formed in 3 Training Institutes of DoT (viz. NTIPRIT, NICF, WMTDC) under the overall supervision of DDG (CB&T) to finalize the Framework of Roles, Activities and Competencies (FRAC) in respect of available positions in the DoT and subsequently mapping of dictionaries of (Positions/ Roles/Activities and linked competencies) in iGOT and creation of training content for bridging the competency gaps.
- xi. A One-day workshop/session on “Mission Karmayogi and FRAC process for DoT officers” has been conducted by CB&T Division on 30.08.2022 for all Division/Unit Heads of DoT to familiarize them with Mission Karmayogi, FRACing methodology, iGOT platform and its benefits.
- xii. As on 15th Nov 2022, total 1597 employees of DoT have onboarded on iGOT platform and can access the available online courses.

- xiii. Design and finalization of a 4-weeks Common Induction Training Module have been coordinated centrally by C&T Division with administrative and training units/divisions of ITS, IRRS and IP&TAFS cadres, for newly recruited probationers of these services of Department of Communications. This Common Induction Training Modules aims to inculcate in young probationers the ethos and culture of the organization, help the probationers of different services to build bonds with each other and expose them to a sense of larger goal and responsibilities to serve as public servant. The 1st Batch of Common Induction Module for probationers of ITS, IP&TAFS, IRRS is slated to commence in Jan 2023.

7.5.2 National Telecommunications Institute for Policy Research, Innovations & Training

i About the Institute

The Department of Telecommunications was established the National Telecommunications ACADEMY (NTA) in the year 2010 as the technical training institute of the department. Subsequently, in the year 2011, the mandate of Institute was expanded by bringing into the activities related to Policy Research and Innovations under its ambit and the institute was rechristened as National Telecommunications Institute for Policy Research, Innovations & Training (NTIPRIT). Since then NTIPRIT has grown strength to strength and the institute is now a Central Training Institute (CTI) enlisted with Department of Personnel & Training. NTIPRIT is presently operating from the campus of ALTTC at Ghaziabad.

ii Summary of Training activities in FY 2022-23 (Till October 2022):

NTIPRIT has conducted Induction training programs for Indian Telecommunications Service (ITS), Junior Telecom Officers (JTO) probationers and Capacity building programs for In-Service officers of DoT, Online –certification courses for officials of various Ministries/ Department and courses for international participants under the aegis of Asia Pacific Tele-Community programs in the year 2022-2023.

- a) The 104-week induction training of ITS-2019 batch got completed in F.Y 2022-23.
- b) Thirty- Nine (39) Webinars, In-service course and Workshops have been conducted till October, 2022 and 6385 officers attended these courses.
- c) One Online Certification courses was conducted till October, 2022 and 151 participants attended this course.
- d) One international course for APT participants has been conducted in September, 2022. 08 participants attended the training course.
- e) Ten (10) MCTP (Mid- Career Training Program) of Technical and Management Component conducted for various Phase & Batch. Total 259 participants attended the training program.
- f) Four (04) new courses uploaded on i-GoT Portal.

iii Overall summary of Training courses conducted:

S. No.	Type of Courses	Cumulative (from April 2022 to October 2022)		
		No. of Courses/Modules	No. of Trainees	Trainee Days
1.	Induction Course for ITS Group-A Officers	25	22*	3950
2.	Induction Course for JTO Group –B	15	33**	4143
3.	Webinars	11	2936	2936
4.	In- Service courses/ workshop	28	3449	3978
5.	Mid Career Training Program (Technical)	07	188	1030
6.	Mid Career Training Program (Management)	03	71	470
7.	International Training	01	08	56
8.	Certification Courses	01	273	3020
	Total	91	6980	19583

*ITS 2019 Batch OTs (08 in number) completed their Induction Training on 07.10.2022.

** 04 OTs of JTO 2019(RL) and 2020 batch have resigned till 09.11.2022.

iv Important glimpses of training

- a) President Meet of ITS 2018, 2019 and 2020 batches: NTIPRIT conducted the President Meet of officers of ITS-2018, 2019, and 2020 batches on 30.09.2022 at Rashtrapati Bhavan.



Group Photograph of ITS officers of ITS-2018, 2019, and 2020 batches, Secretary(T), and DG NTIPRIT with Hon'ble President of India, at Rashtrapati Bhavan (30.09.2022).

- b) Interaction of Officer Trainees (OTs) of ITS 2020 batch with Hon'ble Governor of Haryana
- c) Interaction of ITS-2018, 2019, and 2020 batch with Chairman, and Members of Digital Communications Commission
- d) Visit of Hon'ble Minister of State for Communications to NTIPRIT: Hon'ble Minister of State for Communications Shri Devusinh Chauhan visited NTIPRIT on 21.07.2022 at ALTTC Campus. Hon'ble Minister of State for Communications also visited the labs i.e. ICT Lab, Big Data Lab and Network Security Lab commissioned by NTIPRIT and motivated Officers to carry on doing good work for Nation Building.



DG, NTIPRIT Presenting the memento of NTIPRIT to Hon'ble Minister of State for Communications

- e) Commissioning of Network Security Lab: _

The Network Security Lab was inaugurated by Sh. Nizamul Haq, Member (Services), DCC on 25.06.2022. This Lab has configurable setup to facilitate DoT officers to learn about network security fundamentals such as VPNs, VLANs, Router security, Firewall, Encryption, Digital Certificates, DDOS attack, Man in the middle attack, DNS spoofing and Network Hardening techniques etc

- f) Course on "iGoT Portal"

NTIPRIT created four (04) courses on iGOT portal (<https://portal.igotkarmayogi.gov.in>) in FY 2022-23 (till October) The courses are live on the portal and is accessible for all government officials.

There are total 07 course which is live on the portal. The other 7 courses uploaded on the portal are as follows:

1. 5G New Radio Frame Structure
2. 5G New Radio Spectrum Related Aspects
3. 5G Core Network Architecture
4. Open Radio Access Network (O-RAN)
5. Lawful Interception Architecture of 5G
6. Information Security Basics
7. PM-WANI

7.5.3 National Institute of Communication Finance (NICF)

- i National Institute of Communication Finance, Ghitori, New Delhi is an Apex Level Training Institute of DoT and one of the Central Training Institute approved by DoPT. The Institute has been mandated to conduct the following Training:
 - a) Induction Training to Probationers of IP&TAFS Group-A & Group-B Officers and Group-C Officials.
 - b) In-Service course (MCT) and workshop/Seminars for capacity building
 - c) Preparing Training Materials and R & D in the domain areas.
- ii Important glimpses of training
 - a) Secretary (T) inaugurated a Capacity building & skill Development Program for small licensee which was organized at IITM, Chennai on 07.07.2022 and 08.07.2022 and more than 235 participants (TCPs/ISPs/Sr Officers of DoT/Sr Officers of IITM/ Industrialists) attended this program.



Inauguration of Capacity Building Programme of small licensees by Secretary (T) at IITM

- b) Implementation of Mission Karmayogi: National Institute of Communication Finance under the guidance of Capacity Building Commission conducted one-day workshop on 'National Standards for Civil Service Training Institutions' framework for Nodal Officers of all CTIs and ATIs at NICF on 27th July 2022. Hon'ble Minister of State for Communications Shri Devusinh Chauhan inaugurated the program.



Hon'ble Minister of State for Communications, Shri Devusinh Chauhan inaugurated workshop on 'National Standards for Civil Service Training Institutions' framework '

iii NICF Project

The project of Setting up of Physical Infrastructure at NICF with built up Area- 48000 sq. m. (approx.) is under progress. The total cost of the project is 248.20 Crs in which the tendered cost to the executing agency CPWD is 162 Cr. On 28th March, 2011 the Foundation Stone laid by the then Minister for Communications and the construction work has started from 18.04.2018.

The new Infrastructure has total 30 number of Building Blocks:

- a) Residential Quarter: 76 quarters
- b) Academic Block: G+2, Computer labs, classrooms, conference halls, etc
- c) Institutional Hostel: 226 rooms (169 single occupancy)
- d) Admin Block: for senior officers.
- e) Sports Centre with Swimming Pool, Lawn Tennis, Basketball court.
- f) Trainees Club & Faculty Club
- g) Rain Harvesting Pond
- h) Convention Centre & Commercial complex
- i) Playground with seating gallery.
- j) Seminar Hall/ Auditorium.

iv Other trainings

Sl.	Batch No.	Period		No. of Participants
		From	To	
01.	15th	02.05.2022	24.06.2022	37
02.	16th	18.07.2022	09.09.2022	39
03.	17th	03.10.2022	25.11.2022	37

a) AAO Induction Training: 3 (three) weeks Departmental Induction Training for 04 (Four) AOs/Sr.AOs have been done for the period 18.07.2022 to 29.07.2022 and 29.08.2022 to 02.09.2022

b) Junior Accountant Induction Training:

Sl.	Name of the Training	Period		No. of Participants
		From	To	
01.	Induction Training of newly recruited JAs of Department of Telecom (2 nd Batch)	17.05.2022	24.06.2022	36
02.	Induction Training of newly recruited JAs of Department of Telecom (3 rd Batch)	25.07.2022	02.09.2022	28
03.	Induction Training of newly recruited JAs of Department of Telecom (4 th Batch) & Refresher Training of JAs (1 st Batch)	26.09.2022	04.11.2022	21
04.	Induction Training of newly recruited JAs of Department of Telecom (5 th Batch) & Refresher Training of JAs (2 nd Batch)	21.11.2022	30.12.2022	23

7.5.4 Workshops:

Details of Workshops/Capacity Building Programmes performed till date is furnished as follows:

Sl.	Name of the Course	Date
01.	WS on Gender Sensitization	18.04.2022
02.	CBP on USOF	19.04.2022 to 20.04.2022
03.	CBP on NPS & SDBS	26.04.2022 to 27.04.2022
04.	WS on PFMS	04.05.2022 to 05.05.2022

05.	WS on Finance for Non-Finance Executives	19.05.2022 to 20.05.2022
06.	CBP on Communication Skills and Noting & Drafting	23.05.2022
07.	CBP on Postal CSI	26.05.2022
08.	CBP of GFR, Procurement Manuals, GeM	08.06.2022 to 09.06.2022
09.	WS on APAR, Promotion, DPC, Procedure, Roaster Management	08.06.2022 to 09.06.2022
10.	CBP on IPPB	28.06.2022
11.	WS on GeM	12.07.2022 to 13.07.2022
12.	WS on RTI	14.07.2022
13.	WS on PFMS, EIS & e-Lekha	03.08.2022 to 04.08.2022
14.	CBP on PLI	17.08.2022
15.	WS on SAMPANN	22.08.2022
16.	WS on GeM	23.08.2022 to 24.08.2022
17.	WS on Spectrum Management	12.09.2022 to 13.09.2022
18.	WS on Advance Excel	21.09.2022 to 22.09.2022
19.	CBP on GST and Input Tax Credit	03.10.2022.
20.	CBP on Savings Bank and Finacle	08.10.2022
21.	WS on NPS	11.10.2022
22.	CBP on Savings Bank and Finacle	18.10.2022
23.	CBP on Pension Disbursement process in Postal and DoT	27.10.2022
24.	WS on MS Office	10.11.2022
25.	WS on RTI & Handling of Legal cases	15.11.2022

7.5.5 Field Officer's Conference

For the first time, a 2-day Field Officers' conference including all Field Units of Department of Telecommunications, its CPSEs, autonomous body, subordinate offices and industry stakeholders was held at Vigyan Bhawan, New Delhi on 14th and 15th September, 2022. The Conference was inaugurated by Hon'ble Minister of State for Communications and the valedictory function was presided over by Hon'ble Minister for Communications. Secretary/T, Wing Heads and all Senior Officers of the Department participated in the deliberations and in the brainstorming sessions. A unique feature of the Conference was the industry stakeholder-led Working Groups presentations on topical issues such as Right of Way (RoW), promoting Ease of doing Business, Utilization aspects of BharatNet, 5G Rollout use cases, security challenges in the sector, compliance and testing, AtmaNirbhar Bharat in the context of Telecom and the need for revision in existing Telecom Legislation. Training & Capacity building and the review of processes and procedures within the Department in the light of technological changes and customer expectations were also discussed



at the Conference. The Field Officers' Conference proved to be successful in not only bringing various Divisions/Wings and other constituent units of DoT together in the common pursuit of Departmental excellence but in also helping various industry-stakeholders and DoT Officers across the length & breadth of the country understand each other's perspectives in taking the telecom sector forward as part of the national objective.

7.6 STAFF WELFARE AND SPORTS

The Welfare Cell under General Administration Branch undertakes various activities for the welfare of staff which, inter-alia, include grant of Scholarship, Book Award and financial incentives to the meritorious school / college going children of the employees. Besides this, conveyance allowance / hostel subsidy is also granted to the differently-abled children of the employees. Ex-Gratia financial assistance is also provided to the employees and their family in distress. In order to encourage the spirit of adventure and foster brotherhood amongst the employees, Welfare Cell also organizes excursions / recreation tours, for which subsidy is provided from the Welfare Fund.

Book Awards totalling Rs. 9,08,000/- were distributed to the wards of DoT employees, from which Rs. 76,000/- was sanctioned under SC, ST, & OBC relaxation. Scholarship Awards of Rs. 10,54,000/- were distributed to the wards of DoT Employees, from which Rs. 44,000/- was sanctioned under SC, ST & OBC relaxation. Incentive Awards of Rs. 1,24,100/- were distributed towards DoT employees, out of which Rs. 16,400/- was sanctioned under SC, ST & OBC relaxation. An amount of Rs. 19,000 was awarded to mentally/physically challenged wards of DoT employees as Scholarship & conveyance allowance/hostel subsidy.

Anticipated achievements till end March, 2023:

1. Every year applications are invited from DoT employees for different scholarship schemes. Accordingly, it is proposed to issue circulars for the Academic Year 2021-22 in respect of

Scholarship, Book Award, Incentive Award and scholarship to mentally/physically challenged wards of DoT employees in the month of January, 2023.

2. Every year women's day is celebrated in the Department of Telecommunications and an expenditure of Rs. 50,000/- on women's day celebration is anticipated in the month of March, 2023.

7.7 SWACHHTA MISSIOIN

7.7.1. Swachhta Pakhwada was observed in the Department during the period from 16th to 30th November, 2022. The Department of Telecommunications drew up an Action Plan for observing Swachhta Pakhwada in a befitting manner and for focused attention towards cleanliness. The activities started with administering of Swachhta Pledge. Further, special cleanliness drive has been carried out throughout the Pakhwada period and this practice will continue throughout the year.



Swachhta Pledge administered by Member (F)

7.7.2 **Special Campaign 2.0:** Special Campaign was organized in Department of Telecom, its attached & subordinate offices, field offices and PSUs, across the country from 02.10.2022 to 31.10.2022. The Campaign focused on liquidation of pendency in respect of MP's references, references from State Government, Inter-ministerial references, Parliamentary Assurances, PMO References, Public Grievances & PG Appeals. In addition, the Campaign has ensured a number of special drives for cleanliness in and around the Office premises by way of weeding out of files and also scrapping of obsolete office equipment.

- i During the Campaign, about 100% disposed of pending Public Grievances & Appeals, Inter-ministerial references and State Government references were achieved. As regards MP References the disposal percentage was 36%. During the Campaign 500 sites across the country were identified for cleanliness drive and the said target was exceeded due to enthusiastic participation of officers / officials. During the campaign, against an identified target of reviewing 1,15,000 physical files, 97000 physical files were reviewed and 12000 files were weeded out. More than 20,000 sq feet of space was cleared due to better record management.

- ii During the campaign, revenue of more than a Rs. 2 crore was earned by scraping disposals. Further, Secretary (T) inspected and participated in Field Office cleaning and tree planting at Haridwar on 22.10.2022.
- iii Apart from impressive quantitative targets, the Department of Telecom has adopted certain 'best practices' in Sanchar Bhavan complex which are already showing promising results. These include: -



- a) Photo Stopping Single Use Plastic Drinking Water bottles in the Sanchar Bhavan Complex.
- b) Consulting services of a contractual lady doctor every working day afternoon. This is a boon for health & hygiene of the 900 regular and contractual employees posted in Sanchar Bhavan complex.
- c) Setting aside fixed time every Friday afternoon for special cleaning of the office premises.
- d) Cleaning up of piled up scrap in the basement and converting it into a Recreation Club.



- e) Converting space adjacent to parking lot into a modern canteen which due for operationalization shortly.



- f) In addition, the following 'pilot projects' have been taken up during the Special Campaign 2.0 :

(a)	Replace plastic pens with environment friendly recyclable pens	
(b)	Provision of Sanitary Napkin pad dispenser in ladies washroom.	
(c)	Provide motion sensor detectors to 'switch on' and 'switch off' all lights/other electrical appliances in Office Chambers.	

7.8 OFFICIAL LANGUAGE

Activities

During the period 2022-23 (April, 2022 to March, 2023), following items of important work relating to the progressive use of Hindi were undertaken/proposed to be undertaken by the Official Language Division: -

- i Implementation of the Official Language Policy and the Annual Programme of the Govt. of India

All Sections, attached and subordinate offices and Public Sector Undertakings under the administrative control of the Department were advised to comply with the provisions of the Official Language Act, Rules and instructions issued thereunder for achieving the targets fixed by the Ministry of Home Affairs, Department of Official Language, in their Annual Programme for the year 2022-23. Various check-points were also devised for the effective implementation of the Official Language Policy of the Union in this regard. Quarterly Progress Reports regarding progressive use of Hindi in the Department, its attached and subordinate units and the Public Sector Undertakings under its administrative control were reviewed and necessary instructions issued for taking corrective measures. Section 3(3) of the Official Languages Act, 1963 was complied with during the period under review.

- ii Hindi Salahakar Samiti (Hindi advisory committee)

In pursuance of the guidelines issued by the Ministry of Home Affairs, Department of Official Language from time to time, there is a Hindi Salahakar Samiti of the Ministry of Communications, Department of Telecommunications. Consequent upon the expiry of its tenure of three years on 14th September, 2018, Hindi Salahakar Samiti of the Ministry of Communications, Department of Telecommunications was reconstituted on 14th March, 2022. As prescribed, functions of the Samiti will be, as before, to render advice to the Government in regard to the implementation of the provisions relating to Official Language contained in the Constitution, Official Languages Act and Rules framed thereunder, decisions

of the Kendriya Hindi Samiti, implementation of the instructions issued by the Department of Official Language to improve and strengthen progressive use of Hindi in the Department of Telecommunications and its attached and subordinate offices as well as undertakings. Last meeting of the pre-reconstituted Hindi Salahkar Samiti was organized on 29 May, 2018 at Raipur (Chhattisgarh). A meeting of the reconstituted Hindi Salahkar Samiti is proposed to be organized before the close of the current financial year.

iii Monitoring and Inspection

The Official Language Division acts as a co-ordinator in the event of Official Language inspections of various offices/undertakings/organizations under the control of the Ministry of Communications, Department of Telecommunications conducted by the Second Sub Committee of the Committee of Parliament on Official Language (CPOL). In these inspections, the Ministry/Department is represented by a Joint Secretary level officer {(Deputy Director General (Coordination and Administration))} and representative(s) of the Official Language Division. Four such inspections of the offices under control of the Department of Telecommunications have taken place so far in the current year.

iv Official Language inspections of offices located in Delhi and outside by the Ministry/ department

In order to assess the status of the implementation of the Official Language Policy, it is mandatory for the Ministry/Department to conduct official language inspections of at least 25% of its offices/undertakings/units etc., as per targets prescribed by the Ministry of Home Affairs, Department of Official Language, in their Annual Programme 2022-23. Department of Telecommunications is conducting Official Language Inspections under an Action Plan on quarterly programme basis (at-least 15 inspection per quarter). During the period under report, 26 such inspections of offices located in 'A', 'B' and 'C' regions have been conducted in the first three quarters of the current year maintaining COVID-19 protocol. Some inspections in 'B' region are yet to be conducted in the remaining period of the third quarter. More inspections as per the Action Plan will be done in the fourth quarter of the current year i.e. up to 31st March, 2023 to meet the target. On occasions of inspections of this Department and offices under its control, the Second Sub-committee of the Committee of Parliament on Official Language (CPOL) also emphasises the mandatory requirement of official language inspections by the Ministry/Department of the offices/undertakings under its control, as per the targets fixed by the Department of Official Language, Ministry of Home Affairs.

v Training in Hindi Language, Hindi Stenography and Hindi Typewriting

Official Language Division also processes nominations of officials for various training courses conducted under Hindi Teaching Scheme by the Central Hindi Training Institute, Department of Official Language, Ministry of Home Affairs. During the period under report, no officials were nominated by this Division for training in such courses due to second wave of Covid-19 pandemic and other reasons. However, since the Central Hindi Training Institute has introduced on-line training programmes, officials for the same will be nominated as and when such training programmes are received.

vi Meetings of the Official Language Implementation Committee

Quarterly meetings of the Official Language Implementation Committee (OLIC) of the Department are held as per provisions, wherein progress relating to the use of Hindi in official work in the department is reviewed and based on discussions therein, effective strategy is worked out for the improvement of progressive use of Hindi and implementation of the official language policy. During this period, these meetings could not be held on regular basis due to COVID-19 pandemic and other unavoidable reasons. However, to ensure meetings for all the quarters some meetings had to be organized on joint basis also.

vii Celebration of 'HINDI PAKHWARA'

In consonance with effective implementation of the Official Language Policy and creating awareness of using Hindi in day-to-day official work, 'Hindi Pakhwara' was organized from 14.09.2022 to 28.09.2022 in the Department which was concluded on 29th September, 2022 with a Hindi Quiz on freedom struggle under the aegis of 'Azadi Ka Amrit Mahotsav Celebrations' as a special event for promotion of Hindi in the Department. During the 'Hindi Pakhwara' 09 Hindi competitions were held. maintaining proper physical distancing in view of Covid-19 pandemic. Cash Prizes (one first prize, one second prize, one third prize and ten consolation prizes for each competition) were distributed to winner employees. Certificates to the winners were also awarded in a 'Certificate Award Ceremony' organized in the Department 29.11.2022.

viii Translation activities

During the period under report, apart from the regular translation of routine material, a number of important and time-bound translation of material relating to Standing Committee on Demand for Grants/Parliamentary Assurances, Action Taken Notes, Cabinet Notes, RTI matters, Parliament Questions, Delay Statements, Monthly Summaries, documents specified in Section 3 (3) of the Official Languages Act, 1963 and other parliamentary activities was carried out.

(ix) Notifying offices under rule 10(4) of the official language rules, 1976

Besides the above official language activities, the Official Language Division also processes the proposals received from Corporate Offices of BSNL, MTNL etc. to notify their offices under various telecom circles across the country, under Rule 10(4) of the Official Languages (use for official purposes of the Union) Rules, 1976, where 80% and above officials have acquired working knowledge of Hindi.

7.9 PARLIAMENT MATTERS**7.9.1 Assurance fulfilled (Laid on the Table of Lok Sabha/Rajya Sabha)**

i	Lok Sabha:	11
ii	Rajya Sabha:	10

7.9.2 Annual Report and Audited Accounts, etc. of the PSUs/Autonomous/Statutory Bodies laid during the year:

Sl. No.	Name of the Organizations	Laid in Lok Sabha	Laid in Rajya Sabha	Status
1	Bharat Sanchar Nigam Limited (BSNL), 2021-22	21.12.2022	23.12.2022	
2	Mahanagar Telephone Nigam Limited (MTNL) 2021-22	21.12.2022	23.12.2022	
3	Bharat Broadband Network Limited (BBNL) 2021-22	21.12.2022	23.12.2022	
4	# Telecom Regulatory Authority of India (TRAI) 2021-22	—	—	Pending
5	Centre for Development of Telematics (C-DoT) 2021-22	21.12.2022	16.12.2022	
6	Telecommunications Consultant India Limited (TCIL) 2021-22	21.12.2022	16.12.2022	
7	Indian Telephone Industries Limited (ITI) 2021-22	21.12.2022	16.12.2022	

Annual Report alongwith Audited Accounts of the Telecom Regulatory Authority of India (TRAI) for the year 2021-22 was also submitted to Lok Sabha/Rajya Sabha Secretariat for laying but could not be laid due to pre-adjournment (sine-die) of Parliament on 23.12.2022.

7.9.3 Questions Answered (Approximately):

i	Lok Sabha:	Starred:	18	Unstarred:	164	Total:	182
ii	Rajya Sabha:	Starred:	05	Unstarred:	67	Total:	72

7.9.4 Legislative Business: NIL

Chapter 8
Vigilance

Chapter 8

Vigilance

8.1 SCOPE AND FUNCTIONS OF VIGILANCE WING

Vigilance Wing of Department of Telecommunications (DoT) caters to vigilance activities including handling of Vigilance/Disciplinary cases in respect of officers/officials posted in DoT and its subordinate offices/ DoT officers deputed to other Departments & Public Sector Undertakings (PSUs)/ Board level officers in PSUs under DoT namely, Bharat Sanchar Nigam Limited(BSNL), Mahanagar Telephone Nigam Limited (MTNL), Indian Telephone Industries(ITI) Limited, Telecommunications Consultants India Limited (TCIL), Bharat Broadband Network Limited (BBNL) and Autonomous body - Centre for Development of Telematics (C-DOT).

8.2 RESPONSIBILITIES OF VIGILANCE WING:

- i. Scrutiny of complaints having vigilance angle.
- ii. Investigation/inquiry of complaints having vigilance angle.
- iii. Examination of the Self-contained notes/ CBI reports and its follow up.
- iv. Seeking advice from CVC on the cases having vigilance angle.
- v. Extend assistance/liaison with CBI/Lokpal/Police & other agencies in the enquiry/ investigation of cases.
- vi. Processing of Prosecution sanction in corruption cases.
- vii. Issues concerning suspension and other departmental actions against the employees concerned in vigilance matters.
- viii. Processing the departmental disciplinary proceedings arising out of vigilance matters, in respect of all employees of DoT including retired employees.
- ix. Coordination with CVC, UPSC, DoPT and other agencies on vigilance matters.
- x. Monitoring the implementation of final orders issued in Vigilance cases.
- xi. Ratification of major penalties in respect of absorbed employees of BSNL & MTNL.
- xii. Processing the appeal, review and revision petitions in departmental proceedings, arising out of vigilance matters.
- xiii. Issue of Vigilance clearance.
- xiv. Review exercise under FR-56(j) by respective Cadre Controlling Authorities in the Department and under the similar provisions in the PSUs of the Department.
- xv. Preparation and maintenance of Agreed list, Officers of Doubtful Integrity (ODI) list etc., and necessary action thereon.
- xvi. Conduct of periodic/surprise inspections/reviews/audits and scrutiny of Audit reports.

- xvii. Suggesting systemic/procedural improvements for ensuring transparency and mitigating scope for corruption or malpractices.
- xviii. Identification of sensitive areas and monitoring implementation of rotational transfer policy.
- xix. Scrutiny of 'Annual Property Returns' & 'Intimation of acquisition/disposal of property'.
- xx. Coordination for organizing training /workshop on vigilance matters and observance of 'Vigilance Awareness Week'.
- xxi. To review the existing arrangements for Vigilance work in the Department, Public Sector undertakings/ autonomous bodies/attached offices/subordinate offices under administrative control of the Department to assess, if it is adequate for ensuring expeditious and effective disposal of vigilance matters.
- xxii. Appointment of Chief Vigilance Officers in the Public Sector undertakings/ autonomous bodies/attached offices/subordinate offices under administrative control of the Department.
- xxiii. Conduct of review meeting with the CVOs of Public Sector undertakings/ autonomous bodies to discuss pending issues/ cases related to Vigilance matters.
- xxiv. Updating of relevant data on Probity portal & System for Online Vigilance Clearance Enquiries (SOLVE) portal.

To carry out such functions, a full-time Chief Vigilance Officer (CVO) of the rank of Joint Secretary heads the Vigilance Wing in Department of Telecommunications (DoT).

8.3 VIGILANCE ACTIVITIES [DURING THE PERIOD FROM JANUARY-2022 TO DECEMBER-2022]

8.3.1 Complaints and disciplinary actions

Vigilance Wing of DoT receives the complaints from various sources like President's Secretariat / Prime Minister's Office /CVC /CBI/Members of Parliament/General Public etc. These complaints are then scrutinized and taken up for investigation to identify the delinquent officers/officials and fix responsibility along with the suggestion for systemic improvements, if any, required. During the period: -

- i. 342 complaints handled.
- ii. 15 Final Orders were issued.
- iii. Proceedings dropped/Exonerated in Six (6) cases. In three (03) cases officials were censured. One (01) official imposed with withholding increment. One (1) official 100% pension & gratuity cut on permanent basis. Four (4) official imposed with varying cut in pension.
- iv. 27 cases for imposition of penalty received from BSNL/MTNL were ratified.
- v. 21 appeals against punishment orders were decided.
- vi. 5 Charge sheets were issued during the period.

8.3.2 Grievance- PG Portal

Nineteen (19) grievance petitions received through Centralized Public Grievance Redressal and Monitoring System (CPGRAMS) from various sources viz. President Secretariat, PMO, *Department of Administrative Reforms and Public Grievances (DARPG)*, Directorate of Public Grievances (DPG) in Cabinet Secretariat, and Department of Pensions & pensioners' welfare, were disposed of.

8.3.3 Training & Workshop

- i. Five days training programme on 'Vigilance and Disciplinary Proceedings' for Probationary ADETs was organised at National Telecommunications Institute for Policy Research, Innovation & Training (NTIPRIT) during April 2022.
- ii. One-day webinar on Cyber Crime & Cyber Security under Vigilance Training was conducted at National Institute of Communication Finance (NICF), New Delhi during April -2022.
- iii. Two days Webinar on 'Drafting of Charge Sheet & Disciplinary Proceeding' was conducted at National Institute of Communication Finance (NICF), New Delhi during May -2022.
- iv. Two days workshop on 'Role of Vigilance Officers in DoT' was conducted at NTIPRIT during June-2022
- v. Five days training programme on 'Establishment and Vigilance' for Probationary JTOs was conducted at NTIPRIT during August-2022.
- vi. Two days Seminar on 'Administrative Vigilance' for IP & TAFS Group 'A' Officers of DoT/DoP was conducted at NICF during August-2022.
- vii. A 3 days virtual Training program on the subject "Vigilance Administration and related aspect for Group 'A' officers (EIC/DD Level) of IRRS Cadre was conducted during November-2022.
- viii. One Workshop on 'Role of Inquiry Officers (IOs)/ Presenting Officers (POs) 'at NTIPRIT, one Workshop on 'Administrative Vigilance & Preventive Vigilance' at NICF and virtual Training program on the subject "Vigilance Administration is expected to be conducted during January-2023 to March-2023.

8.3.4 Vigilance Clearance (VC)

- i. At present Vigilance Clearance requests are being processed online and vigilance clearances are issued online directly to the concerned requesting Authorities through Sanchar VHR (Vigilance and Human Resource) portal, introduced to issue Vigilance Clearances. This has reduced paper work and time in furnishing Vigilance Clearances.
- ii. Vigilance Clearance is an important activity of the Vigilance Wing as Vigilance clearance (VC) is required at the time of promotion, retirement, obtaining passports, visiting abroad, and deputation to other Organizations/Departments etc. During the

period, Vigilance Clearances, including CVC clearances, were issued to 4904 officers/officials for various purposes.

- iii. 13-point Performa for processing cases for CVC Clearance in respect of empanelment of Joint Secretary & above level officers and Board Level appointments in PSUs is also generated and processed online through Sanchar VHR portal. During the period 242 (Two hundred forty two) 13-point peformas were processed.

8.3.5 Consultation with statutory/constitutional bodies

- i. Consultation with Central Vigilance Commission (CVC)

CVC is the apex vigilance institution having jurisdiction over all Ministries/ Departments/PSUs etc. for vigilance related matters. Action against Government officers/officials is initiated in consultation with the CVC. The Vigilance Wing of DoT coordinates with the CVC for vigilance related matters. During the period, CVC advice was sought in respect of 7 cases. During the period CVC advice has been received for 2 cases.

- ii. Consultation with the Union Public Service Commission (UPSC)

Consultation is required with the UPSC in cases where the Disciplinary Authority is the Hon'ble President of India or disciplinary proceedings under Rule 9 of CCS (Pension) Rules, 1972. In addition, UPSC is also required to be consulted where the appellate Authority is Hon'ble President of India and in Review cases where modification in penalty is proposed. During the period, **25 cases** were referred to UPSC for advice. During the period UPSC advice has been received for 21 cases.

- iii. Consultation with the Department of Personnel & Training (DoPT)

Consultation with the DoPT is required in all disciplinary cases where there is a disagreement between Disciplinary Authority and the UPSC /CVC. DoPT is also consulted in cases where UPSC/ CVC directs the DA to consult with the DoPT. During the period, **13 cases** were referred to DoPT. During the period DoPT advice has been received for 13 cases.

8.3.6 Miscellaneous activities

- i. Court cases: Some court cases against the Department arise out of disciplinary matters and such cases are handled by Vigilance Wing. Total **180** court cases were handled by the Vigilance Wing during the year, out of which **29** cases pertaining to disciplinary matters were settled and **151** cases are presently pending in various courts/ tribunals.
- ii. RTI Applications: Timely supply of information to citizens is very important and this aspect is given due importance in Vigilance Wing. During the period, **46** RTI applications have been disposed of by the CPIOs and **4** appeal cases have been disposed of by First Appellate Authority in Vigilance Wing.

8.3.7 Other Important activities

- i. The list of files has been compiled year-wise to review old/closed files as per records retention schedule and **531** files were weeded out during the period.
- ii. Extra efforts were made to expedite completion of long pending disciplinary proceedings like resolving issues in ongoing disciplinary proceedings, early hearing/ stay vacation where disciplinary proceedings are pending due to stay in court, regular follow up with Inquiry Officers (IOs) etc.
- iii. A special Campaign 2.0 under the direction of Cabinet Secretary for housekeeping activities was undertaken in all the sections of Vigilance Wing.

8.4 VIGILANCE AWARENESS WEEK

8.4.1 As per directions of Central Vigilance Commission a 3 months campaign (16th August, 2022 to 15th November, 2022)- as a precursor to Vigilance Awareness Week- 2022 was started in DoT HQ , subordinate offices and field units of DoT. The following activities were undertaken during the campaign period:

- i. Property Management: To identify and list out all the land/ buildings owned by Department or on lease agreement and take action as directed.
- ii. Management of Assets: Identify old, unused or condemned assets which affects the cleanliness of the working environment and to maintain a professional working space.
- iii. Record Management: Weeding out of old records and disposal of documents that have outlived their usage may be done periodically.
- iv. Technology Initiative:
 - a. Website maintenance & Updation
 - b. Identification of new areas for service delivery for customer's staff to be brought on online portal
- v. Updation of guidelines/ Circulars/ manuals wherever found necessary.
- vi. Disposal of Complaints outstanding as of 15/08/2022.

8.4.2 Vigilance Awareness Week was observed in the Department from 31st October, 2022 to 6st November, 2022. The theme for the week was "Corruption free India for a developed Nation"; "अप्ताचार मुक्त भारत-विकसित भारत".

The week started with Integrity Pledge which was administered by Secretary, DoT in Conference Hall, Sanchar Bhawan, New Delhi. The pledge was followed by signature campaign to support the resolution/ theme of this year's Vigilance Awareness Week. Various competitions like Cartoon Making, Mini Skit, debate, quiz and slogan writing were held to increase the awareness against corruption, amongst the DoT employees and their family members.



Secretary, DoT administrated the Integrity Pledge on 31.10.2022



Signature campaign for "Corruption free India for a developed Nation"



Vigilance Awareness Pad-Yatra was flagged off by Additional Secretary, DoT

A 4 Km Vigilance Awareness Pad-Yatra was flagged off by Additional Secretary, DoT from Sanchar Bhawan in which Officers/Officials from PSUs under DoT namely, Bharat Sanchar Nigam Limited(BSNL), Mahanagar Telephone Nigam Limited (MTNL), Indian Telephone Industries(ITI) Limited, Telecommunications Consultants India Limited (TCIL,) and Autonomous body - Centre for Development of Telematics (C-DOT) participated in large numbers. The Pad-yatra started from Sachar Bhawan and passed through, Patel chowk, Sansad marg, Jantar-Mantar, Jan path, *Ferozeshah Road* and terminated at BSNL Bhawan, New Delhi.

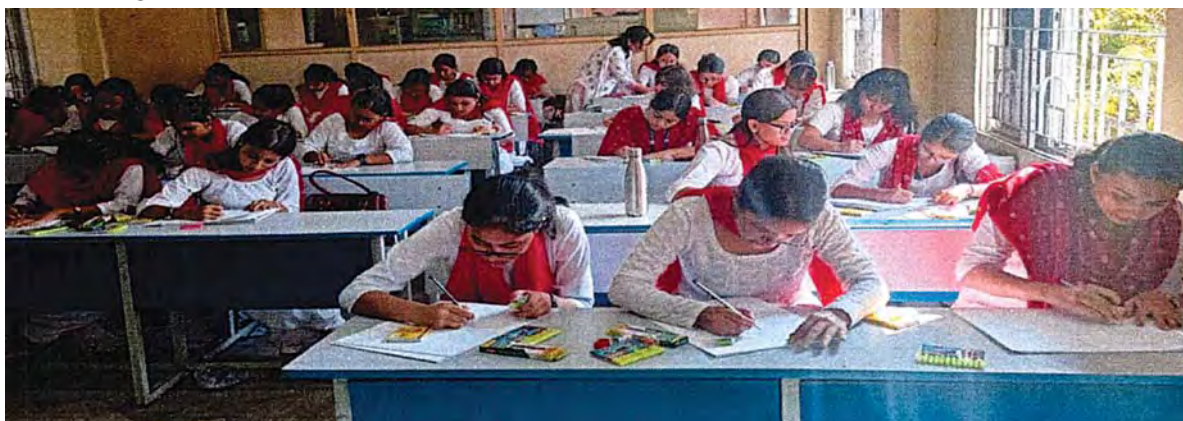
In DoT HQ, Vigilance Awareness Week concluded with prize distribution ceremony held on 4th November, 2022 at Conference Hall, Sanchar Bhawan, DoT HQ, New Delhi. Secretary(T), Member (Services) Member (Technology) and Member (Finance), DoT distributed certificates, mementos and cash prizes to the winners of the competitions held during the Week.



Secretary(T) distributing certificates

8.4.3 Vigilance Awareness Week - 2022 was also observed in various field units of the DoT across the country. This year five cities viz. Jaipur, Jammu, Guwahati, Bhopal and Bengaluru representing 5 different zones were identified to conduct various activities involving public, school & college students, Gram Panchayats etc. during the week.

- i Poster drawing and slogan writing competition was organised at Handique Girls Degree College, Guwahati for students.



Poster drawing and slogan writing competition was organised at Handique Girls Degree College, Guwahati for students

8.5. PREVENTIVE VIGILANCE

Following activities are being coordinated and monitored under 'Review of mechanism to ensure probity amongst Government Servants':

- i. 1734 Annual Property Returns of the Officers of ITS, IP&TAFS and IRRS cadre were scrutinized.
- ii. Review exercise under FR-56(j) by respective Cadre Controlling Authorities in the Department and under similar provisions in the PSUs. During the period 56(J) was invoked against one Officer.
- iii. Timely disposal of prosecution sanctions as well as disciplinary cases.
- iv. Regular meetings are conducted with CVOs of PSUs/Sub-ordinate office/ Autonomous body under DoT in order to ensure early disposal of pending complaints and Vigilance matters.
- v. The Vigilance profiles of Board Level Officers of the CPSEs namely BSNL, MTNL, TCIL, ITI, BBNL & C-DoT are being regularly updated on monthly basis on System for Online Vigilance Clearance Enquiries (SOLVE) portal maintained by DoPT.
- vi. Vigilance inspections were carried out at 5 locations at Lucknow, Bhopal, Ahemdabad, Kolkata and NE circle where offices of LSA, CCA and WMS/WMO were inspected.

CHAPTER 9
WELFARE

CHAPTER 9

WELFARE

9.1 WELFARE OF SC/ ST/ OBC

9.1.1 Department of Telecommunications (DoT)

Representation of SCs/STs/OBCs/EWS (As on 01/01/2022) in Department of Telecommunications						
Group	Total Employees	SCs	STs	OBCs	Others	EWS
A	1803	356	125	252	1069	1
B	992	140	67	135	650	—
C	779	124	45	157	453	—
Total	3574	620	237	544	2172	1

Representation of SCs/STs/OBCs/EWS (As on 01/01/2022) in Wireless Monitoring Organisation						
Group	Total Employees	SCs	STs	OBCs	Others	EWS
A	1	—	—	—	1	—
B	6	1	—	1	4	—
C	138	31	13	37	50	7
Total	145	32	13	38	55	—

9.1.2 Centre for Development of Telematics (C-DoT)

Representation of SCs/STs/OBCs/EWS (As on 01/01/2022)						
Group	Total Employees	SCs	STs	OBCs	EWS	
Executive/ officers	906	169	56	224	-	
Non-Executive/ Non-Officers	135	18	2	18	-	
Total	1041	187	58	242	-	

9.1.3 Bharat Sanchar Nigam Limited (BSNL)

- i. Total number of working employees as on 31.12.2022 (as per ERP Data base).

Group	Number of employees	Employees-Scheduled		OBC	Ex-Servicemen
		Scheduled Caste	Scheduled Tribe		
Executive	29,345	5,956	2,182	8,059	102
Non-Executive	31,405	6,661	2,115	4,863	43
Total	60,750	12,617	4,297	12,922	145

- ii. The Welfare Schemes, which are followed in the BSNL for the benefit of the SC/ST employees, are given below
- Reservation in recruitment and promotion to SC/ST candidates is as per GoI policy on Reservation.
 - Concessions and Relaxations are given to SC / ST employees as per Department of Personnel and Training guidelines.
 - Scheme of pre-recruitment and pre-promotion training is given to SC/ST candidates.
 - Book Award is granted to school going children of the employees. In the Book Award 15 % marks relaxation is allowed for the wards of SC/ST employee.
 - Scholarships given to the wards of employees by BSNL, in which 10% marks relaxation is allowed for the wards of SC / ST employees.
 - Cell is setup in all Circles for taking care of issues related to SC / ST employees.
- iii. The Welfare Schemes, which are followed in the BSNL for the benefit of the OBC employees, are given below:
- Guidelines are scrupulously followed on reservation policies on OBCs in direct recruitment issued by Government of India from time to time and BSNL is providing all the concessions and relaxations for OBCs as per Department of Personnel and Training guidelines.
 - Liaison Officers for OBC in Corporate Office/Circles is already functioning and looking into the complaints and redressal of the grievances of OBC employees.
 - Scholarships are given to the wards of employees by BSNL, in which a relaxation of 10% marks is allowed for the wards of OBC category.
 - Book award are granted to school going children of the employees who have secured 75% or more marks in the last annual examination. In the Book award 10% marks relaxation is allowed for the wards of employees to OBC category.

9.1.4 Mahanagar Telephone Nigam Ltd. (MTNL)

- i. The welfare schemes for reserved category employees in MTNL are as under-
- Pre-recruitment training is provided to SC/ST candidates in departmental examination.
 - MTNL is giving a grant of Rs. 60,000/- to SC/ST Employees Welfare Association in Delhi for celebrating the birth anniversary of Dr. B.R. Ambedkar. Similarly, a grant of Rs. 60,000/- is being given to SC/ST Employees Welfare Association in Mumbai to commemorate the death anniversary of Dr. B.R. Ambedkar.
 - For the welfare of SC/ST/OBC employees a Reservation Cell has been set up each at corporate office/Delhi Unit/Mumbai Unit. Liaison Officer for SC/ST/OBC has been appointed at Delhi/Mumbai/Corporate office as per Government of India guidelines.
 - In MTNL all the employees including SC/ST category employees are compulsorily provided pre-promotion training in case of financial upgradation of scale from E-2 level upto E-7 level.

Representation of SCs/STs/OBCs/EWS (As on 01/01/2022)					
Group	Total Employees	SCs	STs	OBCs	EWS
Executive/ Officers	1223	246	66	218	-
Non-Executive / Non-Officers	2539	644	53	131	-
Total	3762	890	119	349	-

9.1.5 Indian Telephone Industries Ltd. (ITI Ltd.)

- i. Schemes for SC/ST Employees: The Facilities provided to SC/ST Employees:
- Exempted from payment of application / examination fee
 - Relaxation in age by 5 years in recruitment
 - Concessions in qualifying marks
 - Reservation in recruitment and promotion as per Presidential Directives.
 - Out of Turn allotment of quarters
 - Scholarship to the children of SC/ST employees.

Representation of SCs/STs as on December 2022			
Group	Total Working Strength	SC	ST
Officers	1591	239	46
Non-Officers	586	126	11
Total	2177	365	57

ii. Budget allocated and expenditure incurred

There is no specific budget allocation for expenditure on schemes for SC / ST employees. However, as and when expenditure is required to be incurred, specific approval of Competent Authority is obtained.

9.1.6 Telecommunications Consultants India Limited (TCIL)

i. Schemes for the benefit of SC/ST/OBC category employees:

- a) Reservation guidelines are followed for SC/ST/OBCs for all cadres/posts in Direct recruitment which includes relaxation in age and % of marks in educational qualifications.
- b) Travelling Allowance is also paid to the candidates called for interview
- c) The representation cases of SC/ST/OBC candidates are considered sympathetically as and when recruited and are put up with positive outlook in order to meet their expectations subject to administrative constraints
- d) For monitoring and implementation of reservation policy, a Liaison Officer is appointed, so that the concerned employees can forward their representation/grievances to Liaison officer besides HR Division
- e) Organize the training programs from time to time.
- f) SC/ST/OBC Representative(s) is included in Interview Selection Board and Departmental Promotion Committee for recruitment and promotions to safeguard the interests of reserved candidates
- g) TCIL has executed various programmes including Welfare and Socio-Economic Development of SC/ST/OBC and others under CSR schemes

Representation of SCs/STs/OBCs/EWS (As on 31.12.2022)

Group	Total Employees	SCs	STs	OBCs	EWS
Executive / Officers	348	57	18	52	-
Non-Executive / Non-Officers	360	56	7	78	-
Total	708	113	25	130	0

9.1.7 Bharat Broadband Network Limited (BBNL)

Representation of SCs/STs/OBCs/EWS (As on 01/01/2022)					
Group	Total Employees	SCs	STs	OBCs	EWS
Total	16	3	0	5	—

9.2 WELFARE OF DIFFERENTLY ABLED PERSONS

Information and Communication Technologies (ICT) have the potential for making significant improvements in the lives of persons with disabilities, allowing them to enhance their social, cultural, political and economic integration in communities by enlarging the scope of activities available to them.

Accessible ICT can level the playing field for persons with disabilities across life domains including education, employment, e-governance and civic participation, financial inclusion, etc.

This department in terms of the mandate contained in Section 40 of the RPwD Act, 2016 is endeavoring to create an accessible ICT ecosystem by pursuing accessibility issues in ICT sector with the concerned stakeholders.

9.2.1 Department of Telecommunications (DoT):

As far as improving accessibility in telecom services, DoT has issued instructions to Telecom Service Providers (TSPs) regarding provisioning of telecom services to PwDs.

Further in pursuance to RPwD Act, 2016 mandate to make all public centric buildings accessible, the DoT has been regularly endorsing DEPwD guidelines to its attached organizations/ PSUs for identification and retrofitting of government buildings as per “Harmonized Guidelines and Space Standards for Barrier Free Built Environment for PwDs and Elderly Persons, 2016” as issued by Ministry of Urban Development. Recently, DoT has evolved an ad-hoc accessibility audit procedure regarding post retrofitment exercise, and has issued to all concerned stakeholders to ensure technical correctness and compliance to standards.

Representation of PwDs (As on 01/01/2022) in Department of Telecommunications					
Group	Total Employee	VH	HH	OH	Other forms of disability
A	1803	2	1	12	—
B	992	3	—	11	—
C	779	5	—	3	—
Total	3574	10	1	26	—

Representation of PwDs (As on 01/01/2022) in Wireless Monitoring Organisation					
Group	Total Employee	VH	HH	OH	Other forms of disability
A	1	—	—	—	—
B	6	—	—	—	—
C	138	—	—	—	—
Total	145	—	—	—	—

9.2.2 Centre for Development of Telematics (C-DoT)

For recruitment of persons with disability, C-DOT follows government rules provided for reservation in jobs in C-DOT.

C-DOT has a system in place to look after the welfare of persons belonging to this category and address any problems /complaints that may come up.

i. Benefits for Differently Abled Persons:

The C-DOT Campus at Delhi has been constructed in such a manner so as to ensure barrier free environment for the persons with disabilities. The main entrance/exit can be approached through a ramp together with stepped entry. Even elevators connecting the various working areas have been installed in way to facilitate persons with disabilities to move around freely from one wing to another.

Representation of PwDs (As on 01/01/2022)					
Group	Total Employee	VH	HH	OH	Other forms of disability
Executive/ officers	906	-	-	17	-
Non-Executive/ Non -Officers	135	-	-	-	-
Total	1041	-	-	17	-

9.2.3 Bharat Sanchar Nigam Limited (BSNL)

i. The Welfare Schemes, which are followed in the BSNL for the benefit of differently Abled Persons, are given below:

- Reservation (@ 4% of vacancies in Cadre) for Persons with Disability in Direct Recruitment in terms of RPwD Act, 2016.
- Reservation (@ 4% of vacancies in Cadre) for Persons with Disability in promotion has been implemented as per DoPT OM dated 17/05/2022.
- Exempting Differently Abled Employees and also employees who are care giver of Disabled child from routine / rotational transfers within the Administrative Constraints.

- d) Provision for payment of Transport Allowance at double the normal rate to Differently Abled Employees.
- e) Rate of Transport Allowance to Blind or orthopedically handicapped employees shall in no case be less than Rs. 1000/-.
- f) Special allowance for child care for women employees with disabilities @Rs. 1000 per month per child maximum for two Children till the child attains two years.
- g) Financial Assistance to handicapped/mentally retarded children of employees for transport/hostel subsidy are given as below:
1. Rs. 150/- per month per child in 'A' Cities
 2. Rs. 100/- per month per child in other Cities and areas
- h) Transport charge / Hostel subsidy will also be available at the same rule to differently abled children studying in recognized colleges.
- i) Friendly workplace for Differently Abled Employees with provision of ramp/railings to allow their safe and smooth entry/exit and washroom accessible with wheelchair etc.
- j) Grievance Redressal Officer has been nominated in all the Circles of BSNL to address the Grievances of the PwDs employees.

Representation of PWDs as on 31.12.2022

Group	Total Employees	Differentially abled Persons
Executive/ Officers	29345	654
Non-Executive/Non-Officers	31405	259
Total	60750	913

9.2.4 Mahanagar Telephone Nigam Ltd. (MTNL)

MTNL has always endeavored towards upliftment of social status of physically disabled people by innovating and executing action plans falling under its realm. There are several steps taken by MTNL in fulfilling its social responsibility. The provisions for reservation for such candidates, as per the Government of India Rules have been made in recruitment of officers in various streams. However, post VRS introduced in the year 2019, wherein more than 14,000 employees had opted for VRS and were relieved in the year 2020, no direct recruitment has taken place till date.

Representation of PwDs (As on 01/01/2022)					
Group	Total Employee	VH	HH	OH	Other forms of disability
Executive/ Officers	1223	-	2	16	-
Non-Executive / Non-Officers	2539	-	-	4	-
Total	3762	-	2	20	-

9.2.5 Indian Telephone Industries Ltd. (ITI Ltd.)

ITI Limited is a public sector undertaking in the telecommunications technology segment established as a departmental factory in 1948.

- i. The Facilities provided to Differently Abled Persons:
 - a) PWD employees who are residing in the township are given special allowance at double the rate of 5% of Basic pay.
 - b) PWD employees are permitted 10 minutes' grace time to Punch In and Punch Out for making their attendance at the commencement and closure of shift respectively.
 - c) PWD employees are allotted quarters on out of turn basis.
 - d) As per the government directive ITI has been maintaining 4% reservation for PWD in recruitment and the reservation in promotion has also been maintained wherever applicable.
 - e) For PWD candidates, the Company has been relaxing 10 years in age in recruitment for Group C and D posts and 5 years in case of Group A & B posts
- ii. Budget allocated and expenditure incurred

There is no specific budget allocation for expenditure on schemes for Persons with Disabilities employees. However, as and when expenditure is required to be incurred, specific approval of Competent Authority is obtained.

Representation of PWDs as on December 2022		
Group	Total Working Strength	PWD
Officers	1591	13
Non-Officers	586	4
Total	2177	17

9.2.6 Telecommunications Consultants India Limited (TCIL)

- i. Schemes for the benefit of Differently Abled Persons:

- a) Concessions in service conditions are admissible to all Differently Abled employees as per guidelines.
- b) Transport allowance at double the normal rate is given to Differently Abled employees as per government guidelines.
- c) No physically disabled employee is posted in remote areas where hardship conditions are involved. Their postings/transfers are considered sympathetically.
- d) The cases/representations/grievances of disabled persons if any, are considered favorably.
- e) A liberal view is taken while forwarding application of Differently Abled candidates.
- f) Special facilities like separate lift for disabled, stair chair at reception is available for their comfort and convenience.
- g) During COVID-19 period, Persons with Disabilities were allowed to work from home except those whose presence was required were called on roster basis on alternate days, as per requirement.

Representation of PwDs (As on 31.12.2022)					
Group	Total Employee	VH	HH	OH	Other forms of disability
Executive / Officers	348	2	0	0	0
Non-Executive / Non-Officers	360	0	1	2	0
Total	708	2	1	2	0

9.3 EMPOWERMENT OF WOMEN

In accordance with the strategic approach of the Government to achieve the goals of gender mainstreaming and gender justice, laid down in the National Policy for Empowerment of Women, steps have been taken by Department of Telecommunications.

Further, the Department of Telecommunications is effectively implementing the guidelines/instructions of the Supreme Court on prevention of sexual harassment of women at work place in all its units. In pursuance of the orders of the apex court, it has set up a committee on the sexual harassment of women headed by a lady officer.

9.3.1 Bharat Sanchar Nigam Limited (BSNL)

Group	Number of Employees	Women Employees
Executive	29,345	4,497
Non-Executive	31,405	7,080
Total	60,750	11,577

- i. In respect of schemes for the benefit of Women the following schemes are existing in BSNL.
- Maternity leave of 180 days is given to all women employees.
 - Child Care Leave as per the provisions of DOP&T OM No. 13018/2/2008-Estt.(L) dated 11.09.2008 is available to women employees.
 - Special allowance for Child Care for Women employees with disabilities @ Rs.1,000/- per month per child maximum for two children till the child attains two years.
 - Grant of Child Adoption leaves of 180 days to female BSNL employees and extension of the facility of Paternity leave to adoptive fathers.

9.3.2 Mahanagar Telephone Nigam Limited (MTNL)

- i. The manpower strength and the number of women employees as on 30.09.2022 is as follows:

Group	Total Working strength	Women
A	201	16
B	1019	192
C	1534	301
D	900	222
TSM	2	0
Total	3656	731

MTNL has always endeavored towards women participation in the Organization and the Nation Building. 20% of total manpower is of women employees.

- ii. In addition, MTNL has also taken several steps towards furthering empowerment of women employees. A few of those are enumerated below:
- Special care has been taken in case of female employee working in night shift and they are provided with rest rooms/ dormitory. Night Shift Allowance is also paid to them. Night Shifts are organized in such a way that the woman employees do not have to travel at late nights.
 - For women working in the same positions, same remuneration is paid and there is no discrimination whatsoever in payment of compensation on the basis of Caste, Gender, Religion etc.
 - In order to redress the grievance relating to sexual harassment at work place, Sexual Harassment Complaint Committee has been constituted at Unit level as well as in Corporate Office.

- d) Maternity/Paternity leave is also available to employees.
- e) Child Care Leave is provided for a maximum period of two years (i.e. 730 days) with pay upto 3 months and without pay upto 2 years inclusive of 3 months with pay.
- f) Creche facility has also been provided for women employees with infants.
- g) Special Grant is being sanctioned on an annual basis for MTNL Women Welfare Organization, which in turn provides vocational training to kith and kin of working as well as retired/deceased employees.

9.3.3 Indian Telephone Industries Ltd. (ITI Ltd.)

ITI Limited is a public sector undertaking in the telecommunications technology segment established as a departmental factory in 1948.

Group	Total Working strength	Women
Officers	1591	308
Non-Officers	586	109
Total	2177	417

- i. The Facilities provided to Women Employees:
 - a) Separate lunch room in canteen, rest rooms and crèches have also been provided in the Units.
 - b) The Company has comprehensive health care scheme providing medical treatment / reimbursement to the employees and their dependent families. Hospitals have set up in Bangalore, Naini, Mankapur, and Rae Bareli Plants which emphasize women and child welfare.
 - c) In the light of Supreme Court Judgment on sexual harassment in the work place, the standing orders applicable to women employees have been amended to incorporate the clause on sexual harassment during the year 2004-2005 and CDA rules also were amended accordingly.
 - d) Complaints Committee formed in each Unit to inquire into complaints of sexual harassment complaint made by any women employees in the Company and also uploaded in Company Website.
 - e) Care is taken to ensure that women employees are nominated for training programmes, which are need based.
 - f) In pursuance of the Amendment, to Section 5(3) of the Maternity Benefit Act, 1961, the maternity leave is enhanced in the Company from Twelve Weeks to Twenty-Six weeks with effect from 01/04/2017.

- g) Company is celebrating Women's Day every year to encourage women employees.

9.3.4 Telecommunications Consultants India Limited (TCIL)

i. Schemes for Benefit of Women in TCIL

- a) TCIL employee strength as on 31.12.2022 is 767 (including deputation) out of which 106 are female employees.
- b) Organization has taken various initiatives for women empowerment. Equal opportunities are provided to all women workforce for skill up-gradation and career progression at all levels so as to improve their participation and contribution to the growth of the Organization.
- c) Competency mapping is done at various levels and pool of women employees are identified who can take up leadership roles. Succession planning has been introduced and women employees are being identified for taking up lead roles in the organization. Job rotation ensures that women and men have equal exposure to all the functions of the organization including mainstream functions such as Project management, Project Implementation and Execution, Business Development, Finance & HR.
- d) TCIL is an equal opportunity provider and thus equal opportunity is given to women applicants. In various committees of the organization female representatives are adequately present. Leaves like Maternity, abortion are in place. Late hour transportation for all employees, wherever necessary is facilitated. TCIL promotes structured trainings for skill upgrading at various levels, for all employees. Regular talks on various issues affecting women, like health and safety, work life balance and sexual harassment at workplace are conducted.
- e) TCIL has in place ICC (Internal Complaints Committee) as per the guidelines of Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act 2013. Various programs and workshops on Sexual Harassment of Women at Workplace have been organized for TCIL employees.
- f) International Women's day was organized on 8th March, 2022 at TCIL Bhawan with great fervour in which Women empowerment talks were organized including talks.

9.3.5 Centre for Development of Telematics (C-DOT)

C-DOT's Management has always been sensitive to gender issues and has consistently worked towards creating organizational culture reflecting gender equality. Presently, about 32.3% of staff in C-DOT are women.

i. Existing Policies:

- a) All female staff members are allowed to avail up to 180 days maternity leave & up to 90 days leaves subsequent to that (270 days inclusive of 180 days maternity leave). For miscarriage/abortion, leave of a total of 45 days in the entire service span is permissible.

- b) Child Care leave is also granted to eligible female staff on their applying for the same, as per rules.
- c) C-DOT offers accommodation and transport benefits to all its women employees with different options that maybe availed as per individual needs. This ensures the safety and security of all women employees in the company.
- d) Reimbursement for residential telephone expenses is admissible to 100% of the women staff.
- e) Career growth opportunities are available to women employees in C-DOT. In the current financial year, of the total employees promoted to higher grades 26% of them were women.
- f) In management cadres (Team Leaders, Group Leaders, Technical Experts and Director) about 26% are women.
- g) As per the directives of Supreme court, C-DOT has a Complaint Committee for its Centres, at Delhi and Bangalore in case of any complaints relating to Sexual Harassment of women staff at work place for fair and justified view of the complaints, if any, and recommend suitable action on the same to the C-DOT Board.

9.4 PENSIONER WELFARE

PRACHI: Pensioner's Redressal, Assistance and Care at their Home Initiative

(Initiative by O/o Principal CCA)

The objective of PRACHI is to provide pension related services to the pensioners at their doorsteps in a safe, caring, friendly, timely and in an effective manner.

9.4.1 Highlights of PRACHI:

- i. Single Window Grievance Redressal System:
 - a) Multi-Channel Integrated Helpline: This Office has enabled pensioners to reach out for redressal of their grievances/queries/complaints through multi-channel helpline services i.e., Toll Free Helpline, Email, Post/letters/ Drop-Box, SAMPANN helpline desk, CPGRAMS and a dedicated WhatsApp Helpline. Office of Pr. CCA, Delhi is the first CCA office to introduce a WhatsApp Helpline.
 - b) Dedicated Pensioner Assistance Cell: To address the queries, grievances, requests etc. of Pensioners a new Cell - Pensioners Assistance Cell has been created.
 - c) Advance Query & Grievance Management System: All queries/grievances/requests etc. are registered and unique ID is generated for each request received. Unique ID helps in tracking the status of the communications received.

ii. Zero Movement Service:

a) Jeevan Praman Integration: In order to provide ease and facilities pensioners in furnishing of Life Certificate following channels/ facilities have been made available:

1. Biometric - Fingerprint Sensors
2. Biometric - Iris Scanner
3. Facial recognition through smartphone
4. Self-help Biometric DLC machine
5. Organizing camp at remote locations
6. Through Post/ letters and Drop boxes.

More than 22000 pensioners have been authenticated.

b) PPO delivery directly at the doorsteps of the pensioners: in SAMPANN system PPOs are generated and can be printed by the Pensioners themselves.

iii. Other highlights:

- a) Life Certificate in ICU
- b) Digitised Record Management and Process Improvement
- c) Pensioners Drive – through
- d) Localized Pension Adalat
- e) Digital Pension Adalat
- f) Form 16 digitally available
- g) Identification of death cases and Family pensioner's helpline
- h) Dedicated counter at Eastern Court, Janpath for convenience of pensioners
- i) Braille Signage for convenience of differently abled
- j) Pensioner's IC card and Know Your Pensioners (KYP) camp

CHAPTER 10
AUDIT OBSERVATIONS OF C & AG



CHAPTER 10

AUDIT OBSERVATIONS OF C & AG

AUDIT OBSERVATIONS OF C & AG:

Status of C & AG Audit Paras pending as on 13th January 2023

S. No.	Year	Report No.	No. of Paras/ PAC Reports on which ATNs have been submitted to PAC after vetting by Audit (from April 2022)	Details of the CAG Paras* / PAC Report** on which ATNs are pending as on 13/01/2023			
				No. of ATNs not sent by the Ministry even for the first time.	No. of ATNs sent but returned with observation and Audit is awaiting their resubmission by the Ministry	No. of ATNs which have been finally vetted by audit but have not been submitted by the Ministry to PAC	No. of ATNs replied by Department to Audit for vetting
1	2016-17	4 of 2016	28	Nil	Nil	02	Nil
2.	2016-17	29 of 2016	01	Nil	Nil	Nil	Nil
3.	2017-18	11 of 2017	05	Nil	Nil	01	Nil
4.	2017-18	35 of 2017	05	Nil	Nil	Nil	Nil
5.	2018-19	21 of 2018	Nil	Nil	Nil	Nil	01
6.	2020-21	03 of 2021	01	Nil	01	01	Nil
7.	2021-22	2 of 2022	Nil	Nil	Nil	Nil	01
8.	2021-22	15 of 2022	Nil	Nil	01	Nil	01
9..	2021-22	07 of 2021	Nil	Nil	Nil	Nil	01
Total			40	Nil	02	04	04

* Total C&AG Audit Paras of DoT pending as on 13/01/2023 = 10 [02 (Under Modification) + 04 (Sent to Audit) + 04 (For preparation of Hindi/English Version of Reply)].

** 01 PAC Para of PAC Report No. 38 of 17th Lok Sabha pending as on 13/01/2023.

CHAPTER 11
Annexures

CHAPTER 11

Annexures

I	Organisation Chart
II	Statistical Supplement
	<ul style="list-style-type: none">• Telephone per 100 Population-Urban/Rural (Tele-density)• Number of Telephones

Table - 1
Telephone per 100 Population-Urban/Rural (Tele-density) as on 30th November 2021 and 2022

Sl.	Service Area	Tele-Density						Telephones						% of Rural Phones to Overall Phones	
		Overall		Urban		Rural		Overall		Urban		Rural		Nov'21	Nov'22
		Nov '21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22
1	ANDHRA PRADESH	97.00	92.81	121.97	117.09	80.07	75.89	88066774	84604482	44753352	43839946	43313422	40764536	49.18%	48.18%
2	ASSAM	69.62	69.74	169.89	167.88	51.35	51.69	24572589	24846573	9240509	9288630	15332080	15557943	62.40%	62.62%
3	BIHAR ¹	53.54	55.44	117.72	120.60	41.80	43.44	87430717	91833775	29718221	31072363	57712496	60761412	66.01%	66.16%
4	GUJARAT	97.39	92.91	121.47	115.31	74.60	71.26	69710835	67393927	42274856	41118423	27435979	26275504	39.36%	38.99%
5	HARYANA	94.70	90.20	128.71	120.72	70.72	68.14	28178973	27165883	15839745	15252780	12339228	11913053	43.79%	43.85%
6	HIMACHAL PRADESH	142.49	132.81	460.64	445.63	106.04	96.85	10575823	9906256	3514705	3428909	7061118	6479347	66.77%	65.41%
7	JAMMU & KASHMIR	87.19	89.26	154.45	151.86	58.06	61.81	12014676	12387465	6431182	6423625	5583494	5963840	46.47%	48.14%
8	KARNATAKA	102.89	102.48	143.88	144.03	70.93	69.45	69103277	69261463	42336475	43112872	26766802	26148591	38.73%	37.75%
9	KERALA	127.98	122.51	97.24	90.54	209.80	217.59	45642345	43868834	25209605	24261948	20432740	19606886	44.77%	44.69%
10	MADHYAPRADESH ²	69.85	66.48	135.77	129.52	43.83	41.39	80357362	77389269	44208288	42923894	36149074	34465375	44.99%	44.54%
11	MAHARASHTRA	95.34	92.38	147.67	144.93	67.18	64.34	95694132	92661314	51859301	50587860	43834831	42073454	45.81%	45.41%
12	NORTH-EAST ³	78.50	78.43	116.19	115.37	59.12	58.94	12224062	12327431	6143096	6264496	6080966	6062935	49.75%	49.18%
13	ORISSA	76.42	75.92	143.36	140.34	61.08	60.97	33726123	33602195	11796012	11700273	21930111	21901922	65.02%	65.18%
14	PUNJAB	122.97	115.49	187.22	176.00	73.28	68.00	38985182	36852229	25886223	24695694	13098959	12156535	33.60%	32.99%
15	RAJASTHAN	81.99	78.87	141.21	139.90	60.70	56.77	65535189	63731638	29839526	30047698	35695663	33683940	54.47%	52.85%
16	TAMIL NADU ⁴	107.08	102.97	141.86	136.14	67.11	64.17	83708695	80772508	59298375	57576718	24410320	23195790	29.16%	28.72%
17	UTTAR PRADESH - [East]	68.73	66.90	124.16	120.56	50.85	49.44	102368426	100974425	39424087	39257043	62944339	61717382	61.49%	61.12%
18	UTTAR PRADESH - [West] ⁵							65459977	64058405	34513824	33745576	30946153	30312829	47.27%	47.32%
19	WEST BENGAL ⁶	70.13	69.19	118.53	115.79	55.48	55.03	57880543	57046374	22729981	22246017	35150562	34800357	60.73%	61.00%
20	KOLKATTA	148.23	140.76	#	#	#	#	25243605	24775723	23627615	23195670	1615990	1580053	6.40%	6.38%
21	DELHI	269.57	270.62	#	#	#	#	56251152	57537194	54498694	55795893	1752458	1741301	3.12%	3.03%
22	MUMBAI	145.26	135.33	#	#	#	#	38295927	37099064	37075360	35983256	1220567	1115808	3.19%	3.01%
	ALL-INDIA	86.89	84.60	138.79	134.56	59.31	57.67	1191026384	1170096377	660219032	651817584	530807352	518278793	44.57%	44.29%

Note: Teledensity is calculated for UP(E) & UP(W) jointly due to non availability of separate population data for UP(E&W). 1. Includes Jharkhand, 2. Includes Chhattisgarh, 3. Includes North East & II, 4. Includes Chennai, 5. Includes Ultrakhand and 6. Includes A&N Islands. # Rural-urban break up of population for Kolkata, Delhi and Mumbai service areas is not available. Source: Population Projections for India & States 2001-2026, O/o the Registrar General of India and subscribers' data from TSPs.

Table -2

Number of Telephones as on 30th November 2021 and 2022.

Sl.	Service Area	Wireline Phones						Wireless Phones						TOTAL TELEPHONES	
		PSUs' Operators		Private Operators		TOTAL		PSUs'		Private Operators		TOTAL		Nov'21	Nov'22
		Nov'21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22	Nov'21	Nov'22
1	ANDHRA PRADESH	1833671	2274659	683522	676231	1150149	1598428	86233103	82329823	9182467	8294784	77050636	74035039	88066774	84604482
2	ASSAM	185824	261452	102769	108550	83055	152902	24386765	24585121	3127340	3297907	21259425	21287214	24572589	24846573
3	BIHAR ¹	388971	613727	178936	165899	210035	447828	87041746	91220048	5453955	5730007	81587791	85490041	87430717	91833775
4	GUJARAT	1020566	1138273	436908	347835	583658	790438	68690269	66255654	5558866	5186621	63131403	61069033	69710835	67393927
5	HARYANA	318850	410810	182355	194277	136495	216533	27860123	26755023	4962800	4702058	22897323	22052965	28178973	27165833
6	HIMACHAL PRADESH	114626	137035	88334	87954	26292	49081	10461197	9769221	2710918	2526660	7750279	7242561	10575823	9906256
7	JAMMU & KASHMIR	261993	329887	105788	89322	156205	240565	11752683	12057578	1313912	832052	10438771	11225526	12014676	12387465
8	KARNATAKA	2491995	2993851	870560	882307	1621435	2111544	66611282	66267612	6953582	6514593	59657700	59753019	69103277	69261463
9	KERALA	1301020	1336939	1069835	1013989	231185	322950	44341325	42531895	10675401	9980393	33665924	32551502	45642345	43868834
10	MADHYAPRADESH	941463	1214261	291409	258892	650054	953369	79415899	76175008	5967688	5504944	73448231	70670064	80357362	77389269
11	MAHARASHTRA	1363597	1436014	749978	635365	613619	800649	94330535	91225300	6594366	6390616	87736169	84834684	95694132	92661314
12	NORTH-EAST ³	148699	199944	81557	75703	67142	124241	12075363	12127487	1350345	1379535	10725018	10747952	12224062	12327431
13	ORISSA	299019	369394	193146	173283	105873	196111	33427104	33232801	6246307	6323737	27180797	26909064	33726123	33602195
14	PUNJAB	797070	1092003	258750	323156	538320	768847	38188112	35760226	5307331	4987442	32880781	30772784	38985182	36852229
15	RAJASTHAN	645661	792099	301005	282290	344656	509809	64889528	62939539	6178117	6356440	58711411	56583099	65535189	63731638
16	TAMIL NADU ⁴	2271600	2518536	1036242	979124	1235358	1539412	81437095	78253972	9932629	9620725	71504466	68633247	83708695	80772508
17	UTTAR PRADESH - [East]	562920	688872	189592	136164	373328	552708	101805506	100285553	11120915	9786103	90684591	90499450	102368426	100974425
18	UTTAR PRADESH - [West] ⁵	537663	704791	203375	187788	334288	517003	64922314	63353614	5651015	5615695	59271299	57737919	65459977	64058405
19	WEST BENGAL ⁶	346007	461149	229424	261610	116583	199539	57534536	56585225	2661598	2371529	54872938	54213696	57880543	57046374
20	KOLKATTA	844354	833726	394976	211488	449378	622238	24399251	23941997	2236564	2158282	22162687	21783715	25243605	24775723
21	DELHI	3767142	4064405	1295076	1172042	2472066	2892363	52484010	53472789	2154158	1690857	50329852	51781932	56251152	57537194
22	MUMBAI	3090507	3213811	1475547	1298869	1614960	1914942	35205420	33885253	1106687	1071148	34098733	32814105	38295927	37099064
ALL - INDIA		23533218	27085638	10419084	9562138	13114134	17523500	1167493166	1143010739	116446941	110322128	1051046225	1032688611	1191026384	1170096377

Note:1. Includes Jharkhand, 2. Includes Chhattisgarh, 3. Includes North East (I & II), 4. includes Chennai, 5. Includes Uttarakhand and 6. Includes A&N Islands.
Source: Subscribers' data from TSPs.



Department of Telecommunications
Ministry of Communications
Government of India
New Delhi