

NEWSLETTER

TELECOMMUNICATION ENGINEERING CENTRE

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MESSAGE



From the desk of...

Sr. DDG TEC

Dear Readers,

It is my pleasure that I am reaching you regularly through the Quarterly Newsletter of Telecommunication Engineering Centre (TEC) by sharing our view, vision and disseminating information about our achievements and activities.

It's a matter of great pleasure and joy to share that TEC had successfully organized the "2nd International Workshop on 6G Standardizations" in New Delhi on 28th and 29th October, 2023 at IMC-23, Pragati Maidan, New Delhi. The workshop was inaugurated by Shri Devusinh Chauhan, Hon'ble Minister of State for Communications in the presence of Secretary (Telecom), DoT.

Further During the IMC 2023, a stall was put up by TEC in order to showcase the commitment of TEC to standardize new telecom technologies and products and strengthen country's testing and certification driven by spirit of Atmanirbhar Bharat.

I hope that the newsletter for October–December 2023 will certainly serve as a window showcasing the complete profile of TEC and its achievements, progress made and curricular activities during the stipulated period.

I look forward to your continued support and suggestions to further improve the Newsletter.

Best Wishes and Warm Regards,

TRIPTI SAXENA

TEC stall at

INDIA MOBILE CONGRESS 2023

India Mobile Congress, 2023, the seventh edition of IMC, with the theme “**Global Digital Innovation**” was held from 27th to 29th October 2023 at Pragati Maidan, New Delhi. **Hon’ble Prime Minister of India, Shri Narendra Modi** inaugurated the IMC 2023 and awarded 100 ‘5G Use Case Labs’ to educational institutions across the country.

During the IMC 2023, a stall was put up by TEC in order to showcase the commitment of TEC to standardize new telecom technologies and products and strengthen country’s testing and certification driven by spirit of **Atmanirbhar Bharat**. **Shri Devusinh Chauhan, Hon’ble Minister of State for Communications** visited TEC stall on 28th October 2023. He appreciated TEC’s unwavering commitment to standardization, testing and certification which is propelling indigenous tech, startups and innovative testing labs.

TEC participated in IMC with the broad objectives (i) to showcase TEC Standards/ Guidelines, Processes, Certifications etc (ii) communication & Outreach with industry in general and special emphasis on Startups, innovators, MSMEs etc. to understand their needs (iii) to promote standardization in the sector (iv) to explain enabling policies/ scheme of Government viz. PLI, PPP-MII, DCIS etc and (v) to understand ongoing technological advancements and product/ services development and aligning TEC standard formulation agenda/ programme with it.



Visit by Hon’ble MoSC



Visit by Dr. Neeraj Mittal, Secretary (Telecom)



Visit of TEC Stall by Shri Devusinh Chauhan, Hon’ble Minister of State for Communications

The Secretary (Telecom) while visiting the TEC stall appreciated the efforts of TEC and asked TEC for assessment of present Lab capacity and enhancing Lab eco-system, enhancing IOT manufacturing and utilizing IOT in driving Industry 4.0.



Visit by Member (S), DCC, Member (T) DCC and DG Telecom, Dept. of Telecom

TEC stall at

INDIA MOBILE CONGRESS 2023

Apart from above there were many visitors from Government organization, industry bodies as well as OEMs, Startups & MSMEs, who interacted with TEC official and enquired about the TEC standards, certifications and approvals. Representatives of many Industry bodies like VOICE, COAI, TEMA, TEPC etc. visited TEC stall on Atmanirbhar Bharat and interacted various aspects on Standard making certification and approval process.

TEC had showcased a presentation on a screen in the stall, explaining about different standards, standard making processes, types of conformity assessments / certifications and their procedure. It was explained that all the standards prepared by TEC are publicly available from download from TEC website without any cost. In addition, handouts were also made available about TEC Overview and important TEC standards and documents on IOT Use cases etc. Brief about various ITU NWGs were also explained and relevant visitors were encouraged to participate in the same. The stakeholders were also briefed about the Labs and testing facility available with TEC (Control Lab, Green Passport Lab, IPv6 Lab, NGN transport Lab) including the Conformity Assessment Bodies (CABs) recognized by TEC.

TEC stall also displayed/ briefed the stakeholders about various govt. policies / schemes viz. Public Procurement, Preference to Make in India (PPP MII), PLI and DCIS etc. The manufacturers/ stakeholders were explained about the PPP MII policy notification issued of DoT, notified telecom products therein, TEC GRs/IRs to be complied and the provisions related to Type Approval Certificate/ Interface Approval Certificate of TEC.

Demonstration of Test-as-a-Service

During India Mobile Congress (IMC), 2023, TEC showcased the testing & certification capabilities of the Country along with launching of **Taas (Test- as-a Service)** platform as pilot (PoC) by demonstration of remote testing in collaboration with IITM Parvartak.

Telecom Labs-Future & Opportunities (Sewa Viswas ke Saath) - Service with Trust TEC organized a session on “Telecom Labs-Future & Opportunities (Sewa Viswas ke Saath)-Service with Trust” on 29.10.2023. The session was inaugurated by Sr. DDG, TEC. The event was graced by Ms. Sageetha, DG Nepal Telecom, Regulators from Nigeria Telecom, Ms. Indu, VC, DTU and esteemed foreign dignitaries along with participants from NABL, various labs, OEMs of Test and measuring Instruments etc.



During the interaction with various OEMs, startups, industry representatives, academia and R&D organizations, TEC discussed and encouraged them to take active participation in the standardization activities. The researchers in the emerging areas such as Quantum Technology, 6G, advanced optical communications, AI/ML were informed about the importance of SEPs and conversion of their intellectual property rights into SEPs by inclusion in the global standards. TEC will continue interaction with the various organizations and encourage them for active participation in standardization activities and creation of IPRs.

2nd International Workshop on 6G Standardization

28th– 29th October 2023 at IMC 2023 , New Delhi

In every decade, the world sees a new generation of mobile communication, each offering plethora of services and capabilities unfathomable in the earlier generations. With each new generation of mobile communication, the complexity of the standardization process also scales manifold. **IMT-2030** (popularly called the '6G') is already making waves with its promise of unified human-machine and machine-machine connectivity and offers a glimpse of what lies in store for the world. In July, 2023, ITU has released its vision (framework) document for 6G which was approved by the ITU Radio communication Assembly (RA-23) at its meeting in Dubai, United Arab Emirates. This vision document has kick started the standardization process for 6G. Thus, this is an opportune time for different stakeholders, viz. government, academia, industry, etc., to come together and start research in the technologies which may define 6G.

Hence, realizing this as an opportune time, Telecommunications Engineering Centre (TEC) has organized an international workshop with an objective to provide an exceptional opportunity for the research community, industry representatives and standardization experts to come together and discuss ways and means to, increase collaboration in 6G research and development, enhance Indian participation and contribution in standardization at ITU, 3GPP, IEEE, etc. and present startups with the opportunities provided by 6G for new product development.

TEC had successfully organized the “**2nd International Workshop on 6G Standardizations**” in New Delhi on 28th and 29th October, 2023 at **IMC-23**, Pragati Maidan, New Delhi. The workshop was inaugurated by **Shri Devusinh Chauhan, Hon'ble Minister of State for Communications** in the August presence of Secretary (Telecom), DoT.

Hon'ble Minister of State for Communications Shri Devusinh Chauhan has lauded effort of Indian Telecom Industry in realization of **Hon'ble Prime Minister Shri Narendra Modi's** vision of '**AtmaNirbhar Bharat**' in Telecom sector by indigenization of 4G & 5G technologies and fastest rollout of 5G by installing 3.45 Lacs within a year.

Further Hon'ble MoSC reminded the audience the Hon'ble PM vision of **Vasudhaiv khandukam, Antodaya & Democratization of Technology** and urged **Telecom fraternity to lead India to become leader in 6G technology at global front.**

Hon'ble MoSC congratulated TEC & Telecom industry for organizing the Workshop on 6G which is set to be a milestone in 6G standardization. Hon'ble Minister pinned his hope from the 6G technology in realizing the principles of Rural coverage, sustainability and connecting the unconnected.

Dr. Neeraj Mittal, Secretary (T), DoT-HQ, reminded that India is at the cusp of telecom revolution towards 6G technology. He exalted Indian effort for adoption of Ubiquitous Connectivity, Ubiquitous Intelligence and Sustainability as key elements of 6G Technology in '**ITU 6G vision framework**' from “**Bharat 6G Vision**” document.

In realization of Mantra of Hon'ble Prime Minister on '**Democratization of Technology**', Secretary(T) has highlighted the progressive policies adopted by Government such as Production linked incentive scheme, Telecom Technology Development Fund, 6G THz test bed, Advance optical test bed etc which are acting as starting seed in design, development and deployment of 6G technology by 2030 based on principles of Affordability, Sustainability and Ubiquity. Further, these steps have started resulting into 200 patent registered by Indian industry, start-up and academia in 6G.

The talks delivered in the said workshop are available in public domain and can be accessed via following links.

- Day-1:- https://www.youtube.com/watch?v=FZsj_tBHGdk
- Day-2:- <https://www.youtube.com/watch?v=i92T952KoS8>

2nd International Workshop on 6G Standardization Glimpses



Left to Right— Shri Manish Sinha , Shri Ajay Kumar Sahu , Dr. Neeraj Mittal , Shri Devusinh Chauhan , Prof. Kiran Kuchi, Ms Gunjan Dave
Member (F) Member (S) Secretary(T) Hon'ble MoSC IIT H Member (T)



Shri Devusinh Chauhan, Hon'ble MoSC



Dr. Neeraj Mittal , Secretary (T)



Shri R. R. Mittar, Advisor TEC



Ms Tripti Saxena , Sr. DDG TEC

2nd International Workshop on 6G Standardization



Left to Right— Shri R. R. Mittar, Dr. Rajkumar Upadhyay, Prof. Abhay Karandikar, Shri Apurva Chandra, Shri V. Raghunandan, Ms Tripti Saxena
 Advisor, TEC CEO, C-DoT Secretary, DST Secretary, I&B Secretary, TRAI Sr. DDG, TEC



FREE SPACE OPTICAL COMMUNICATION

INTRODUCTION

Free Space Optical Communication (FSOC) system is a wireless form of connection designed for the interconnection of two points which have a direct line of sight. FSOC involves the optical transmission of voice, video, and data using air as the medium of transmission. The data is transmitted using lasers through atmosphere in the infra-red band on point-to-point links.



FSOC ADVANTAGES

Transmission using FSOC technology is relatively simple. It involves two systems each consisting of an optical transceiver which consists of a laser transmitter and a receiver to provide full duplex (bi-directional) capability. FSOC provides point-to-point transmission of communication information through the atmosphere using the Optical signals as the carrier frequencies. It has drawn attention in telecommunication industry, due to its cost effectiveness – easy installation, quick establishment of communication link especially in the disaster management scenario, high bandwidth provisioning and wide range of applications. The range of frequencies where FSOC operates is unregulated spectrum. This technology does not require right of way permits or spectrum licenses.

NEED FOR FSOC

To achieve continuous and high bandwidth connectivity, it is required to address the "Connectivity bottleneck" and "last mile bottleneck" of the network. Service providers are faced with the need to provide services quickly and cost-effectively at a time when capital expenditures are constrained. From a technology standpoint, there are several options to address this "connectivity bottleneck," but most are not feasible or are uneconomical. Firstly, the most obvious choice is fibre-optic cable. Without a doubt, fibre

is the most reliable means of providing optical communications. But the digging, delays and associated costs to lay fibre often make it economically prohibitive. Second option is the radio frequency (RF) technology.

RF is a mature technology that offers longer ranges than FSOC, but RF-based networks require immense capital investments to acquire spectrum license. RF technologies cannot scale and the bandwidth is limited. The third alternative is wire - and copper-based technologies, (i.e. cable modem, DSL etc.). Copper infrastructure is not a viable alternative for solving the connectivity bottleneck. The biggest hurdle is bandwidth scalability. Copper technologies may ease some short-term pain, but their bandwidth limitations make them a marginal solution. Fourth and finally, the most viable-alternative is FSOC. The technology facilitates an optimal solution, bandwidth scalability, speed of deployment (hours versus weeks or months), redeployment and portability, and cost-effectiveness. FSOC technology is particularly effective in areas that are difficult to connect using optical fibre cables (like waterbodies, hills etc.)

FSOC CHALLENGES

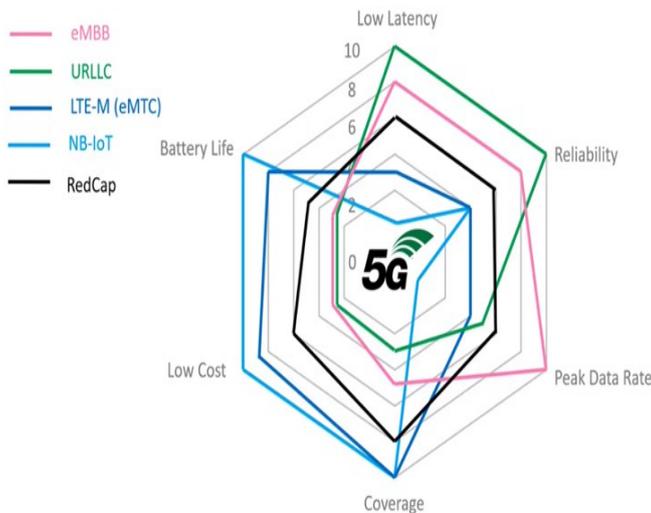
The fundamental limitation of free space optical communications arises from the environment through which it propagates. Although relatively unaffected by rain and snow, free space optical communication systems can be severely affected by fog and atmospheric turbulence. These can modify light characteristics or completely hinder the passage of light through a combination of absorption, scattering, and reflection. This can lead to a decrease in the power density of the transmitted beam, decreasing the effective distance of a free space optical link.

TEC INITIATIVES

The Certificate of Approval (CoA) was issued to M/s Google LLC in the year 2021 for their FSOC product. Subsequently, POC testing of M/s Google -X working FSOC links at Bangalore, Merrut and Kohima was undertaken during the year 2022. Recently, **on 10th January 2024, Certificate of Approval was issued to an indigenous OEM namely M/s Nav Wireless Technologies Pvt. Ltd. Gujarat for their FSOC Product.**

RedCap (Reduced Capability) NR Lite / NR light

In 3GPP Release 17, 5G RedCap (also termed as NR-Lite/ NR-Light) was introduced. It is a new standard for devices known as Reduced Capability (RedCap) devices. 5G RedCap is the latest advancement in cellular technology within the IoT landscape, catering to a range of use cases thus adding a new dimension to IoT connectivity. It addresses diverse use cases lying between high-speed Enhanced Mobile Broadband (eMBB), ultra-reliable Low Latency Communications (uRLLC), and the requirements of low throughput, battery-efficient Massive Machine-Type Communication (mMTC) technologies.



5G spider diagram combined with RedCap
(Source: Qualcomm)

For massive IoT services, narrowband IoT (NB-IoT) and enhanced machine type communication (eMTC) devices prioritize low power consumption and the lowest complexity for wide-area deployments (LPWA), while enhanced ultra-reliable, low-latency communication (eURLLC) devices deliver on the most stringent use case requirements in industry. But there exists an opportunity to address a broad range of mid-tier applications more efficiently, with capabilities between these extremes.

Different types of NR RedCap UEs / Devices may include video surveillance cameras, hand held & wearable devices and Industrial Wireless Sensors i.e. CO2 sensors, pressure sensors, motion sensors, fluid sensors etc.

Advantages of using RedCap / NR Lite over LTE:

- No need to support three different network – NR, eMTC/NB-IoT, and LTE. Telecom operators can migrate their spectrum to NR which can support both URLLC and NR-Lite on the same carrier as well as deploy eMTC/NB-IoT either in-band or in guard-band.
- Better system efficiency with NR as compared to LTE – Features like beam-formed operation, higher subcarrier spacing for latency reduction, massive MIMO for coverage etc.
- Better integration and benefits from 5G core and architecture – network slicing, service based architecture, flow-based QoS etc.

Use case requirements for connected industries using Industrial Wireless Sensor Network cannot be addressed by the NR Release 16 in terms of battery life, form factor and complexity nor by LTE-M/NB-IoT in terms of data rate, reliability and latency.

5G NR-Light enables the mix of capabilities in terms of throughput, battery life, complexity, and device density needed for a variety of use cases in a cost-efficient manner. For instance, NR-Light can be used in the smart city applications such as utility meters, smart grids, predictive maintenance, environmental sensors, city surveillance etc. Thus, RedCap expands the 5G device ecosystem for consumers and industries in ways that are beneficial both from device and network points of view.

Radio Over Fibre Systems

A Radio-Over-Fibre (RoF) system has the capability to transmit waveform information over an optical fibre network for radiocommunication services. Radio over fiber (RoF) is the technology of converting a radio wave (RF) into optical signal by modulating the intensity of the light source (typically a laser) with an RF signal and then transmitting the optical RF signal over a fiber optic cable. While technology related to Analogue RoF system is being deployed in technologically-advanced countries, technology related to Digital RoF system is in development stage. RoF systems are extremely useful in a mobile network consisting of one base station (BS) and many remote antenna sites.

RoF System connects one or more baseband units (BBUs) to the remote radio head (RRH) unit. The BBU is the baseband processing unit in a base station (BS) of the mobile telecommunication system and linked with a service provider's core network to offer various mobile Internet services to users. The RRH contains the base station's radio frequency band (RF-band) circuitry and frequency up/down converter function. Typically, each RRH has plural antennas equipped with high power amplifiers and low-noise amplifiers for supporting multi-input multi-output (MIMO) configuration.

Typically, the RoF system is having following functions:

- electrical interface to put the waveform information into the RoF system;
- electrical-to-optical (E/O) conversion of the waveform information for generating the RoF signal;
- optical interface to transmit the RoF signal into an optical fibre as well as to receive the RoF signal from an optical fibre;
- optical-to-electrical (O/E) conversion of the waveform information for detecting the RoF signal;
- electrical interface to output the waveform information from the RoF system.

To deliver these functions, the RoF system mainly consists of the following components: -

- RoF Optical Line Terminal (OLT);
- Optical Distribution Network (ODN) and
- RoF Optical Network Unit (ONU).

Figure 1 below shows an Analogue RoF system supporting international mobile telecommunication (IMT) system over optical distribution network (ODN).

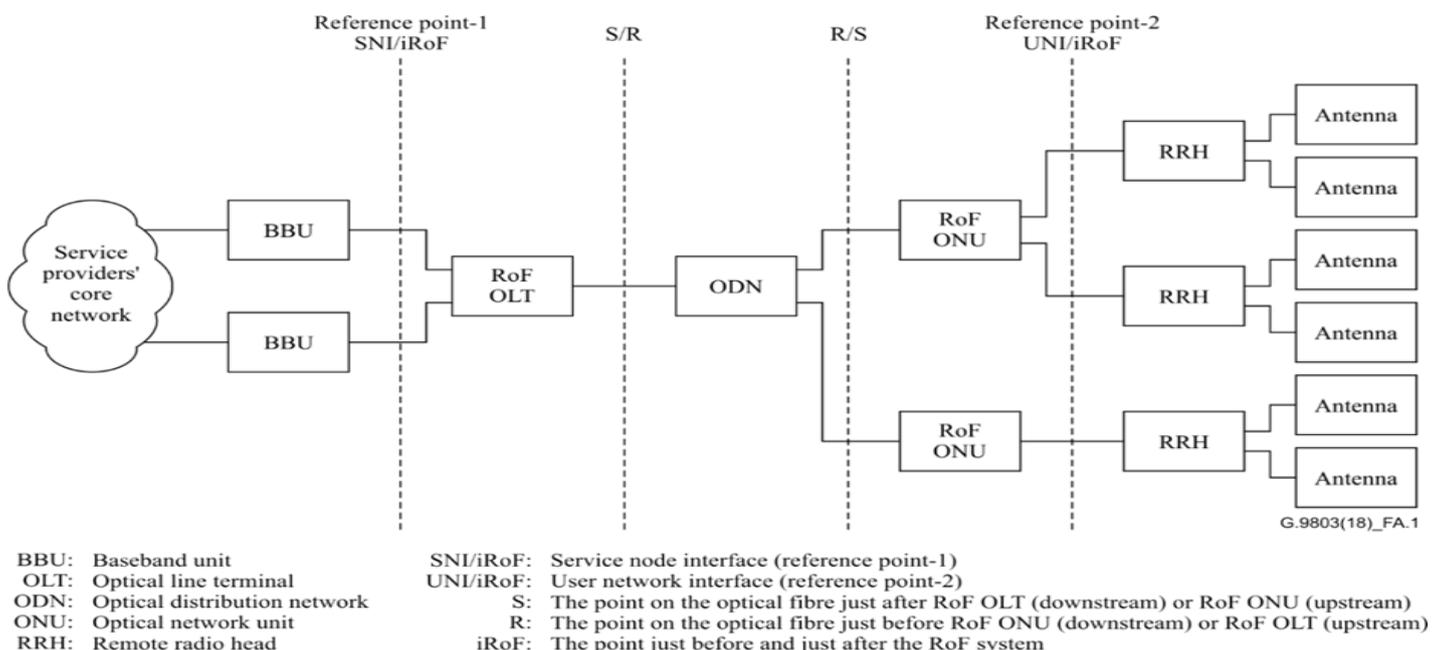


Figure 1: Typical IMT system supported by Analogue RoF system
 (Source: ITU-T G.9803 Recommendations)

Radio Over Fibre Systems

The RoF OLT is commonly located in the network site and directly connected to one or more base-band units (BBUs). The basic function of the RoF OLT is to convert radio signals to optical signals and vice versa. RoF OLT can accommodate multiple BBUs to make efficient use of the ODN.

The ODN is an optical fiber network consisting of optical fibers as a transmission media and optical splitters such as power splitters and/or passive WDM routers to provide connections between the RoF OLT and the RoF ONUs.

The RoF ONUs are usually placed in remote sites. Similar to the RoF OLT, the RoF ONU is capable of converting optical signals into radio signals and vice versa. The ONU are being designed to have protection from power transients, power surges, and power blowouts. The RoF ONUs may be remotely manageable and support configuration functions.

The RoF ONU has a user network interface (UNI) whereas the RoF OLT has a service node interface (SNI). SNI/UNI depends on the nature of services offered by the service provider. SNI and UNI are utilized to define the transmitted signal type and allowable signal delay or latency within the whole RoF system.

RoF systems also have the potential to support various fixed network services to provide compatibility with existing PON systems such as GPON, 10-Gigabit-capable passive optical network (XG-PON), NG-PON2, 50G-PON, etc. WDM would be a reasonable method to support the coexistence.

RoF systems have the potential to support various services for mobile users, residential subscribers, business customers, mobile and fixed backhauling, and other applications. Mobile services defined in ITU-R recommendations on IMT-2000 and IMT-Advanced are also supported by the RoF systems. Further, RoF system supports Dual-stack IP addresses (IPv4 & IPv6) for management and services.

The RoF system also capable to provide full fault, configuration, accounting, performance, and security (FCAPS) management capability for the RoF ONUs. An EMS (Element Management System), having a multi-user system based on a Graphical User Interface (GUI), also desirable to be provided along with the RoF system for centralized management and control of the access network.

To address the requirement of standard for the RoF systems, TEC has issued a standard, titled, **“Generic Requirements for Radio over Fibre Systems: TEC 71130:2023”** and relevant test guides **TEC 71131:2023** (available on TEC website (<https://www.tec.gov.in/standards-specifications>)).

This standard specifies the generic requirements and specifications for Radio over fibre systems for local and access networks, as per, ITU-T G.9803 Recommendations for use in Indian telecom network.

The RoF Systems are offering several advantages like low line losses, higher bandwidth, Immunity to EMI, reduced complexity of base station, lower cost of infrastructure, lower power consumption, etc. Applications of Radio Over Fiber (RoF) Systems include wireless communication networks, 5G technology, radar systems, Broadcast & satellite communication, underground transport communication network among others. It serves as a crucial technology in addressing the increasing demand for high-speed and reliable wireless communication in various domains.

STANDARDIZATION

STANDARDS RELEASED BY TEC:

- Test Guide for Metal Free Optical Fibre Cable with Double HDPE Sheath for underground duct application (Type-I & Type-II) (**Test Guide No. TEC 85241:2023**) This Test Guide of testing pertains to test schedule and procedure for evaluating conformance/functionality/requirements/ performance of Standard for Generic Requirements of Metal Free Optical Fibre Cable (Type-I & Type-II) with double HDPE sheath for underground installation in ducts (**GR No. TEC 85240:2023**). Type-I is Wet core cable and Type-II is Semi Dry core cable. The cable shall have double HDPE jacketing with glass yarn in between as reinforcement.
- Test Guide for Metal Free Ribbon Optical Fibre Cable with Double HDPE Sheath for underground duct application (Test Guide no. TEC 85251:2023): This Test Guide of testing pertains to test schedule and procedure for evaluating conformance/ functionality/ requirements /performance of Standard for Generic Requirements for Metal Free Ribbon Optical Fibre Cable with double HDPE sheath for underground installation in ducts (GR No. TEC 85250:2023). Semi-Dry Core Cable type has been mentioned in this Standard for GR. The cable shall have double HDPE jacketing with glass yarn in between as reinforcement.
- A Provisional Test Guide for TEC GR on “**Radio Modems in Unlicensed (2.4/5 GHz) Bands**” was issued.
- Test Guide namely **TEC 71131:2023** for “**Radio Over Fibre Systems**” was issued . It describes the Test procedures and Test cases of generic requirements for Radio Over Fibre Systems that have the capability to transmit waveform information over an optical fibre network for radio communication services.

ESSENTIAL REQUIREMENTS RELEASED BY TEC:-

- Essential Requirements for “**Non-Geostationary Orbit Satellite Communication Equipment**” have been finalized.
- Essential Requirements for “**V Band Fixed Radio System**” have been issued.
- Essential Requirements(ER) of **Optical Fibre Cable** were revised and issued in October 2023.

CONTRIBUTIONS TO ITU :-

1. ITU-T SG15

During ITU-T SG15 meeting held at Geneva from 20 November – 1 December 2023, following contributions / proposals were presented in the meeting:-

1. Q5/15 - Proposal for revision of ITU-T Rec. L.100 on "Optical fibre cables for duct and tunnel application"
2. Q7/15 - Proposal for a new work item for "Digitalization of operation and maintenance of optical fibre networks using distributed fibre optic sensing (DFOS)"
3. Q7/15 – Addendum for revision of Recommendation L.360: "Operations support system requirements for infrastructure and network elements management using Identification data (ID) technology"
4. Q7/15- L.Suppl.58 to Recommendation ITU-T L.250 .

STANDARDIZATION

2. ITU-T SG-13

Meeting held in ITU HQ at Geneva during 23 October - 3 November 2023, following four contributions were submitted.

- Draft new Recommendation ITU-T Y.Arch_NGNe_ncp: **“Architectural evolution for NGN control plane by applying SDN technology”**
- Draft new Recommendation ITU-T Y.Trust-Registry: **“Trust Registry for Devices and Applications: requirements, architectural framework”**
- The draft recommendation Request to TSB to conduct an analysis for the A.5 qualification of the O-RAN Alliance.
- Contribution for creation of a Focus Group on Artificial Intelligence in 6G

3. ITU-T SG-11

Following 5 contributions have been accepted in ITU-T SG-11 meeting held from 10th-20th October 2023 in Geneva:

- Proposal for advancement in the baseline text of draft new Technical Report TR-CF-QoS **“Impact of Counterfeit Mobile devices on Quality of Service”**.
- Proposal for updating the Terms of Reference of Q12/11.
- Proposal to advance ITU-T Rec. Series Q Supplement 75 (12/2021) - Use cases on the combat of counterfeit ICT and stolen mobile devices with national use case of India.
- Proposal to advance the Recommendation ITU-T Q.CEIR.
- Proposal for a new Technical Recommendation on the technical requirement and implementation strategy for Global IMEI Registry" ITU-T Q.GIR.

4. ITU-T SG-9

3rd ITU-T SG9 meeting was held in Bogota (Colombia) from 14-23 Nov 2023. Based on the recommendation of NWG-9 (in its 12th meeting), Seven (7) contributions were submitted and presented from India in this meeting.

In addition, an ITU Workshop on **“The Future of Television for the Americas”**, was also organised by ITU-T, held on 17.11.2023 during this SG-9 meeting.

In this workshop, Sh. Avinash Agarwal, DDG (C&B), TEC participated as Speaker and gave a presentation on the topic **“Perspectives from India”** in the Session 1 (Shaping the Future of Television - Market Trends, Business Models, and Policy Catalysts_

- Technical Report on Common User Profile (CUP) accepted for publication by ITU
- Supplement of CAS accepted for publication by ITU.

5. ITU-T SG-5

National Working Group- 5 meeting was held on 20.10.2023 for contributions towards ITU-T. Subsequently, following contributions were sent to ITU-T Study Group-5 meeting :

- Baseline text of draft new ITU-T Recommendation K.EMC_UWB **“Electromagnetic Compatibility requirements and test methods for Ultra Wide Band Equipment”**
- Proposal for agreement of the draft new Supplement to Recommendation ITU-T L.1700 on the subject of Low-cost sustainable telecommunication for rural communications in developing countries enabling SIP based voice calling on WLAN/Wi-Fi
- Proposed modifications to baseline text in Draft new Recommendation ITU-T K.devices **“RF-EMF exposure assessment of devices operating close to the human body”**
- Proposal for the content of new Appendix to ITU-T Recommendation K.91
- Proposal for updating the content of the ITU-T Recommendation K.small

STANDARDIZATION

TECHNICAL REPORT PUBLISHED BY TEC

1. IOT DIVISION

Secretary (T), DoT released TEC Technical Report "Technologies and Standards for Intelligent Transport System" (TEC 31218:2023) on 19th Oct 2023 in the presence of Member(S) and Member (T) and other senior officers of TEC / DoT.

This Technical Report is based on the study of national / international standards and guidelines released by ITU, 3GPP, APT, IEEE, ETSI, ISO/ SAE, 5GAA etc. and has elaborated the technologies and standards for the development of Intelligent Transport System. It has also covered the use cases and trials in India and abroad. The recommendations available in this report related to standards, spectrum and security aspects, will be a good reference for the related stakeholders in developing the eco-system for the automotive sector.



Release of TEC Technical Report on **Technologies and Standards for Intelligent Transport System** on 19th October 2023 by Secretary (T), DoT

2. RADIO DIVISION

A study paper on "Use Cases of Drones in Disaster Management" has been finalized.

EXTERNAL ENGAGEMENTS

1. IOT DIVISION

DO Letters have been sent to 12 sectoral ministries to apprise about policies/ standards/ guidelines by TEC, DoT related to IoT/ M2M domain.

2. C&B DIVISION

Telecommunication Engineering Centre (TEC) New Delhi is continuously working in the field of 'Artificial Intelligence' in achieving the objective of Government of India of building public trust in AI/ ML Systems. TEC is willing to work in collaboration with Stakeholders (Academia/ R&D Organizations/ Others) and have identified some opportunities/areas of collaboration.

3. RADIO DIVISION

Radio Division, TEC as member of Tender Evaluation Committee in Directorate of Coordination (Police Wireless) (DCPW), MHA, conducted technical evaluation of bids for procurement of DMR Equipment for State Police Departments.

4. STANDARDIZATION DIVISION

Renewal of Advanced Level Corporate Membership of Institute of Electrical and Electronics Engineers Standards Association (IEEE SA) for the year 2024 has been done for contributing to the standardization activities at IEEE.

5. FA DIVISION

Shri Rakesh Desai, DDG (FA), TEC chaired the 18th meeting of BIS LITD 11 "Fibre Optics, Fibres, Cables and Devices" held on 21st November 2023 in BIS, for revising Indian standards in view of the corresponding revision of ISO/IEC standards. Sh. Rakesh Desai also participated IEC TC 86/WG 1 and SC 86B/WG6 meetings in remote mode on behalf of BIS, India held in Milano, Italy from 15th November 2023 to 24th November 2023

TESTING & CERTIFICATION

MANDATORY TESTING (MTCTE)

Indian Telegraph (Amendment) Rules, 2017 provides that telecom equipment are to be mandatorily tested and certified against EMI/EMC, Safety, Technical, Security and other requirements before its sale, import or use in India.

a) Fresh Certificates issued:

Quarter Q3 = 219	Total = 1294 (till 31.12.2023)
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b) Modified/Renewed Certificates issued:

Quarter Q3 = 73	Total = 202 (till 31.12.2023)
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c) Status of OEM registration:

Indian OEM	11 (Total=146 till 31.12.2023)
Foreign OEM	24 (Total=208 till 31.12.2023)

For more details about MTCTE [Click here](#)

CAB DESIGNATION ISSUED:-

• CAB designations issued -

New = 03	Renewed = 05
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• Total Designated CABs = 63 (as on 31.12.2023)

IT Safety = 42	EMI/EMC = 32
SAR Testing = 04	Environmental = 25
O.F.(single mode) =02	Optical Fiber Cable =02
Wi-Fi Interface =09	Radio Safety =06
GSM/ GPRS/ EDGE=07	BLE Interface=06
RFID Interface=03	LPWAN LoRA IF=04
LTE or LTE-A IF=07	WCDMA or HSPA IF=07

- Site visit and assessment of M/s HFCL LTD. (OFC Testing Lab), Goa for CAB designation case by Committee from 12.12.2023 to 14.12.2023
- CAB designation certificate issued on 29.12.2023 to M/s HFCL LTD. (OFC Testing Lab), Goa against ER of Optical Fibre Cable
- Security Lab has been successfully set up at TEC by accessing VA tool, PT tool and Fuzzer available with NCCS Bengaluru remotely.
- The Security Lab was inaugurated by Member (Services), DCC on 21.11.2023.

VOLUNTARY TESTING :-

- 4 Type Approval, 4 Interface Approval and 1 Certificate of Approval Certificates issued under Voluntary testing and certification scheme during the quarter (Q3 i.e. 01 Oct-31 Dec 2023).
- Total 59 certificates issued till 30.09.2023 (27 Type Approval, 19 Interface Approval, 3 Certificate of Approval and 10 Technology Approval) since 01.04.2021 .

KNOWLEDGE DISSEMINATION

TRAINING/ WORKSHOP/ WEBINAR/ TALKS

1. Telecom Engineering Centre (TEC) along with Invest India and Telecom Infra Project (TIP) organised a webinar on 22nd November, 2023 on Webex Platform on the topic - **“Developing SCOPE in India as the Anchor to Globalize Open RAN”** under the chairpersonship of Advisor, TEC Sh. R.R. Mittar. The webinar focused on appraising the Industry, Academia and the Government about the SCOPE mechanism of TIP for accelerating Open RAN deployment, built in India for the world. Discussion was also held for streamlining Testing and Certification processes for ensuring smooth roll out of Open RAN technology across the globe. The dignitaries and participants looked forward to convening in India to discuss the road map ahead for the Open RAN, later in the beginning of the next year. From TIP side Presentation was given by Mr. Kristian Tiovio and Mr. Gowton Achaibar and from DoT side Presentation was given by Sh. V. K. Roy, DDG (SRI), DoT HQ. Program was organised and anchored by Dr. Prasanth Kumar, DDG (CA), TEC.
2. A workshop on **“Use Cases of Drones in Communication”** was conducted on 20.12.2023. Relevant stakeholders from industry, academia and government organizations were invited for presentation and discussion.
3. Organised a Special Awareness session/ workshop on WTSA-2024: India is going to host the prestigious **World Telecommunication Standardization Assembly (WTSA)** from 15-24 October 2024 preceded by the Global Standardization Symposium (GSS) on 14 October 2024 at Pragati Maidan, New Delhi.
4. To create the awareness about WTSA-2024 in all stakeholders such as Telecom/ICT Industry, Academia, R&D Institutions, Small & Medium Enterprises (SMEs), Start-ups, etc, a special session/ workshop was organized in Jaipur by DoT Rajasthan LSA under the guidance of Standardization Division, TEC on 27.12.2023 at 15.00 Hrs. to 16:30 Hrs. In this workshop, Shri Avinash Agarwal, DDG (Standardization), TEC gave a detailed presentation about standardization ecosystem in India and various activities related WTSA-2024.

4. R-TEC BANGLORE Visits -



Visit to TUV Lab on 07.11.2023 by Sh N Murali Krishna, DDG (SR) in connection with CAB Designation



Tejas Factory visit by Sh N Murali Krishna, DDG (SR) on 13.12.2023 in connection with type approval of GPON equipment



HR ACTIVITY

TEC WELCOMES ON NEW JOINING



- Sh. Ashok Kumar Jha DDG (RC-II)
- Sh. Sandeep Kumar Singhal DDG (RC-I)
- Sh. Vijay Kumar Roy DDG (Radio)
- Sh. Ram Sajiwan Singh DDG (IoT)
- Sh. Narendra Choubey Director (C&B)
- Sh. Shatrughna Singh AD (Tx)
- Sh. Lakhanlal Meena AD (NR)
- Sh. Deo Pratap AD (IT)
- Sh. Neetesh Kumar Meena JTO (C&B)

CONGRATULATIONS ON PROMOTION



- Ms. Jyoti Rout promoted from ADET to ADG
- Sh. Ashul Kumar Gupta promoted from AD to ADET (Radio)

TEC BIDS FAREWELL ON TRANSFER



- Sh. Ritu Ranjan Mittar Advisor
- Sh. Sushil Kumar DDG
- Smt. Shubha N. Bhambhani DDG
- Sh. Deepak Pathak Director
- Sh. Rajmohan Meena ADG
- Sh. Vimal Kumar Singh AD
- Sh. J. Raghunathan AD

राजभाषा कार्यान्वयन समिति की तिमाही

बैठक का आयोजन

दूरसंचार अभियंत्रिकी केंद्र, नई दिल्ली में दिनांक 15 दिसंबर, 2023 को श्रीमती गजाला फ़ैसल, उप महानिदेशक (टीएक्स) की अध्यक्षता में राजभाषा कार्यान्वयन समिति की तिमाही बैठक का आयोजन किया गया। इस बैठक का कार्यवृत्त हिंदी में जारी किया गया। इस बैठक में कुल 24 अधिकारियों ने भाग लिया। इस बैठक में अध्यक्षता महोदया द्वारा हिंदी की तिमाही रिपोर्ट समय पर भेजना सुनिश्चित करने तथा कार्यालय का ज्यादा से ज्यादा कार्य हिंदी में करने का आह्वान किया गया।

UPCOMING ACTIVITIES:-

- FAO Focus Group on 'Artificial Intelligence (AI) and Internet of Things (IoT) for Digital Agriculture' (FG-AI4A) in New Delhi, India, jointly with ICAR, Ministry of Agriculture and Farmers' Welfare, on 19th March 2024. The meeting will be preceded by the ITU/FAO Workshop on 'Cultivating tomorrow: Advancing digital agriculture through IoT and AI' that will take place on 18 March 2024. More information about this meeting is available on ITU webpage (<https://www.itu.int/en/ITU-T/focusgroups/ai4a/Pages/default.aspx>).
- 2nd Meeting of the APT Preparatory Group for WTSA-24 (APT WTSA24-2) will take place from 5th to 6th February 2024.

SIGNIFICANT ACHIEVEMENT

1. RC DIVISION

Launch of Online Modules of Certificate Of Approval (CoA) And Technology Approval under Voluntary Testing and Certification Scheme of Telecommunication Engineering Centre (TEC) on 28.12.2023 by Shri A.K. Sahu, Member (S), Digital Communication Commission (DCC).



As a result, now all types of certificates under Voluntary Testing and Certification including Type Approval Certificate, Interface Approval Certificate, Certificate of Approval (CoA) and Technology Approval Certificate can be applied for and processed seamlessly through the online module.

The above modules are aimed at enhancing the 'Ease of Doing Business' and promoting 'Atmanirbhar Bharat'.

The On-line modules for Type/Interface approval had been previously made operational w.e.f. 07.07.2023, following their launch by Secretary (T), Chairman DCC.

The launch marks a significant step towards streamlining the testing and certification process, fostering an encouraging ecosystem for Start-ups and MSMEs in the Telecom and related ICT sector.

The Start-ups and MSMEs can benefit by taking these certificates for their products pertaining to telecom sector for enhanced credibility of their product.

2. TC DIVISION

MTCTE and NCCS integration portal (ER+ITSAR) launched by Secretary (T) on 22.12.2023 to facilitate ease of doing business and adopt a single window approach.

3. TS DIVISION

One day training on **Testing Capabilities of Control Lab** provided on 17.10.2023 at Telecommunication Engineering Centre. Participants from C-DOT, NCCS & TEC attended this training.

About TEC

- Telecommunication Engineering Centre (TEC) is an ISO 9001:2015 Organization.
- Standards Setting Organization (SSO) for telecom & related ICT sector.
- Designated Authority (DA) for implementation of Mandatory Testing & Certification of Telecom Equipment (MTCTE) and designation of Conformance Assessment Bodies (CAB) & Certifying Bodies (CBs).
- Designated Authority (DA) for testing and certification of Conditional Access System (CAS)/ Subscriber Management System (SMS) used in broadcasting sector as per TRAI notification.
- Designated Authority (DA) for Voluntary Schemes such as Type Approvals/Interface Approvals/Technology Approvals/Certificate of Approvals.
- National enquiry point for WTO –TBT (Technical Barrier to Trade) for telecom sector.
- Complaint resolution authority for local content under PPP-MII (Public Procurement Preference to Make in India) Policy.
- Technical arm/attached office of DoT, responsible for technical inputs on technology/policy matters to DoT and other Govt. Departments/Regulator.
- Nodal agency for all ITU-T Study Group Activities and ITU-R SG5 activities.
- TEC coordinates and participates in the meetings of standards development organizations, viz., ITU, APT, WRC, 3GPP, ETSI, IEEE etc. TEC also interacts with stakeholders and associations, viz., COAI, BIS, CII, TEMA, CMAI, FICCI, etc.
- Additionally: 5G Pilot Trials- Test Guide finalized in consultation with stakeholders; BSNL 4G Proof of Concept (PoC)- Committee for monitoring of PoC trial being chaired by TEC; oneM2M and 3GPP 5G standards of TSDSI- Adoption as National standards.

SUGGESTIONS/ FEEDBACK ARE WELCOME AND MAY BE SENT AT-

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