NEWSLETTER

TELECOMMUNICATION ENGINEERING CENTRE

VOLUME-27 ISSUE-4 OCTOBER 2023

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MESSAGE

From the desk of....

Advisor TEC

Dear Readers,

It is a matter of great pleasure to release the July-September, 2023 issue of the Telecommunication Engineering Centre (TEC) Newsletter.

I believe that this newsletter for July - September 2023 months will serve as a window showcasing the complete profile of TEC and its achievements, progress made and curricular activities during the stipulated period.

We at TEC are committed to provide an ambience to standardize new telecom technologies and products and strengthen country's testing and certification infrastructure.

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

Best Wishes and Warm Regards,

RITU RANJAN MITTAR

1.1. NON-GEOSTATIONARY ORBIT (NGSO) SATELLITE COMMUNICATION NETWORKS

In recent years, the field of satellite communications has drawn an increased attention in the global telecommunications market as several network operators have started using satellites in backhauling infrastructures for connectivity and for fifth-generation (5G) system integration.

Non-Geostationary Orbit (NGSO) Satellites are satellites which are not stationary relative to the surface of the Earth. Unlike Geostationary Orbit (GSO) Satellites, which are located at a specific point in the sky relative to the Earth's surface, NGSO satellites are constantly moving across the sky and completes an orbit in a much shorter period of time. Until the late 1980s, these satellites had limited use for communication applications because, in general, these systems are more complex and, since geostationary satellites met most requirements anyway, not much effort was spent on their development. Evolution in non-geostationary orbit (NGSO) satellites, conveys exciting new communication capabilities to provide non-terrestrial connectivity solutions and to support a wide range of digital technologies from various industries.

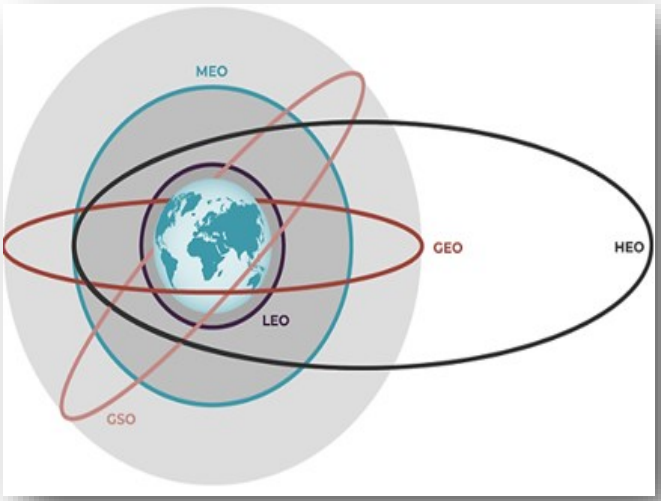
NGSO communication systems are known for a number of key features such as lower propagation delay, smaller size, and lower signal losses in comparison to the conventional GSO satellites, which can potentially enable latency-critical applications to be provided through satellites. Additionally, these modern systems use frequency bands of the fixed satellite service for the user links, i.e. the Ku and Ka bands. There is also a possibility to add higher frequencies in the future for some systems, where even more bandwidth may be available. NGSO supports a substantial boost in communication speed and energy efficiency, thus, tackling the main inhibiting factors of commercializing GSO satellites for broader utilization. This enables better coverage for mobile satellite services, improve global connectivity, and offer more efficient use of the limited radio frequency spectrum.

There are several different types of NGSO orbits which include:

Low Earth Orbit (LEO): This is the closest NGSO orbit to the Earth's surface, with an altitude ranging from about 160 km to 2000 km. LEO satellites typically orbit the Earth once every 90 minutes or less.

Medium Earth Orbit (MEO): They have an altitude ranging from about 2000 km to 36,000 km and orbit the Earth once every few hours.

Highly Elliptical Orbit (HEO): HEO satellites have a highly elliptical orbit that takes them much further from the Earth's surface with an altitude of over 36,000 km.



Satellite systems have been contributing to deliver telecommunication services in a wide range of sectors such as aeronautical, maritime, military, rescue and disaster relief. The early systems were designed to provide voice and/or low-rate data services. The first operational system was Iridium, which started service in 1998.

1.1. NON-GEOSTATIONARY ORBIT (NGSO) SATELLITE COMMUNICATION NETWORKS

Global star and Orbit communication are the three projects that became operational and started service in late 1990s. Typically, the frequency bands of the mobile satellite service (MSS) were used, namely, portions of L-band and S-band were assigned for uplink and downlink to enable the satellites to provide service globally. The second, more recently introduced category of NGSO constellations which can provide global broadband services and higher throughput, e.g., New constellations from Starlink, OneWeb, O3b etc are coming up. O3b claims to provide communication services to the underserved people in the equatorial regions of the earth to whom low-priced high-speed fibre, microwave, or satellite connections are unavailable. Further, OneWeb was one of the early projects that launched more than 70 satellites.

The deployment of satellite broadband systems operating in non-geostationary satellite orbit (NGSO) could enable people and businesses to access a range of high-capacity services, including home broadband, Wi-Fi on-board aircraft, ships and trains; backhaul for mobile phone services and Internet of Things for enterprises. Beyond this, NGSO systems are envisaged to be an efficient solution for future non-terrestrial networks (NTN) to meet the demanding sixth-generation (6G) system requirements in terms of both large throughput and global connectivity. Moreover, by harnessing satellites geographical independence, wireless connectivity can be extended to the underserved and unserved areas, where NGSO systems can facilitate the deployment of 5G and beyond networks. Considering these advantages, NGSO satellites are expected to play a crucial role in bridging the digital divide by extending backhaul for 5G services and providing high-bandwidth links directly to the end users.

Since, a large number of satellites constellations may orbit around the Earth, it increases the chances of satellite interference with existing GSO and other NGSO networks. In order to maintain co-ordination amongst satellites of various orbits and constellations, it is important to set parameters and regulations that will prevent them from causing interference.

To address this subject, TEC has issued a standard, titled, **"Interface Requirements for Non-Geostationary Orbit (NGSO) Satellite Communication Networks in Fixed Satellite Service (FSS) (Mandatory Technical Requirements) "**(https://www.tec.gov.in/pdf/IRs/ngso%20v2.7.pdf) ,which mentions Mandatory Technical Requirements and Operational Requirements for all Non Geostationary satellite orbit (NGSO) based communication networks providing Fixed Satellite Services (FSS) in Ku and Ka band. The technical and operational requirements are necessary for meeting international regulatory requirements and optimizing the network resources. The standard provides for technical and regulatory provisions related to establishment and operation of NGSO Satellite based networks/services. This will enable satellite operators to establish a smooth and functional network for NGSO Satellite communication operations in India.

1.2.

EMF Exposure Measurement from 5G Base Station

The Electromagnetic Field (EMF) exposure assessment of Mobile Base Stations has been implemented by Dept. of Telecommunications to ensure safe EMF exposure from Mobile Towers to general public. The exposure assessment is typically done to determine the size of the RF-EMF compliance boundary (exclusion zone) for the general public and workers around the antennas, and to verify that this zone is not accessible.

Alternatively, calculations or measurements are also conducted close to a base station site, in areas which are accessible for the general public, to verify that the RF-EMF exposure levels are below the applicable limits (refer Table I).

The detailed method of EMF measurement and compliance assessment of Mobile Base Stations is prescribed in TEC document titled **'Test Procedure for Measurement of Electromagnetic field from Base Station Antenna'**.

5G Technology- Path breaking advancements from previous IMT generations

I. 5G base station antennas are expected to use mMIMO antenna arrays and advanced RF technologies like 3D Beam steering and beamforming i.e. the capability of beam steering in both azimuth and elevation, as compared to sector antennas being used in the previous IMT technologies. Beam steering and beamforming allow the mMIMO base station antennas to direct the radio signal to the users and devices rather than in all directions. It uses advanced signal processing algorithms to determine the best path for the radio signal to reach the user.

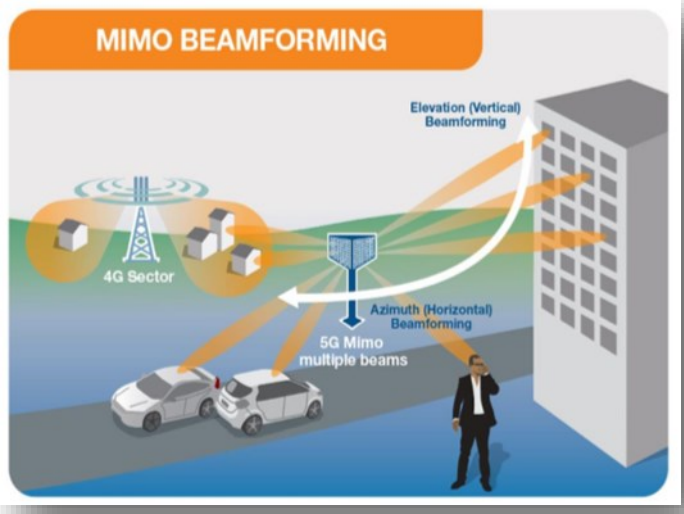


Fig: Massive MIMO beamforming and beam steering in a 5G network. [ITU-T Recommendation Series K Supplement 16 'Electromagnetic field compliance assessments for 5G wireless networks.]

Table I: General Public Exposure limits in India

Note: f is frequency in MHz

Types of Exposure	Frequency Range	Electric field strength (V/m)	Magnetic field strength (A/m)	Equivalent plane wave power density S_{eq} (W/m^2)
General public	400-2000 MHz	$0.434\ f^{1/2}$	$0.0011 f^{1/2}$	f/2000
	2-300 GHz	19.29	0.05	1

1.2. EMF Exposure Measurement from 5G Base Station

II. Secondly, 5G technology is being offered across a range of spectrum-

1. **Low band (below 1 GHz) –** providing widespread coverage across urban, suburban, and rural areas and supporting IoT for low data rate applications.
2. **Medium band (1 – 6 GHz) –** providing good coverage as well as high speeds required for 5G.
3. **High band (above 6 GHz) –** providing ultra-high broadband speeds for advanced mobile broadband applications, and most suitable for applications in dense traffic hotspots.

The spread of IMT over such wide range of spectrum calls for design of new measurement equipment which can support all frequency bands and possibly multiple measurements iterations and new evaluation criteria.

III. Lastly, 5G technology offers application specific flexible frame structure.

The changes in frame structure due to varied subcarrier spacing, symbol level assignment of uplink/downlink eventually leads to difference in power levels of pilot broadcast (reference signal) and application specific traffic beams,

the power levels of multiple such traffic beams are to be measured among shared/non-shared sites and compliance of a site is checked by calculating total exposure ratio based on extrapolation factor which is in turn calculated using various site parameters.

5G NR Frame Structure

1 FRAME 10ms = SSB(PSS+SSS) + PBCH(Data + DMRS)

10 Subframes 1ms

Slots within Subframe(number and time based on SCS)

Symbols within slot: 14 (Normal CP) / 12 (Extended CP); UL/DL assignment done at this level; OFDM symbols : U; D; F

Services which require quick response time

Frequency Band	Subcarrier Spacing SCS (KHz)	No. of slots/subframe	Slot time/subframe (ms)
FR1	15	1	1
FR1	30	2	0.5*2
FR1	60	4	0.25*4
FR2	120	8	0.125*8
FR2	240	16	0.0625*16
FR2	480	32	0.03125*32
FR2	960	64	0.015625*64

4G	5G
Fixed SCS 15KHz	Variable SCS pertaining to application
UL/DL assignment done at Subframe level	UL/DL assignment done at Symbol level

1RB=12 subcarriers
Total RBs =20
Total subcarriers = 240

1.2.

EMF Exposure Measurement from 5G Base Station

TEC Procedure for Measurement of EMF exposure from 5G Base Station

TEC has issued Addendum to TEC Test Procedure for Measurement of Electromagnetic Field from Base Station Antenna **(TEC 13019:2021)**

The Document suggests two in-situ measurement methods:

a) Broadband Method

b) Frequency Selective Method.

Broadband method as the name suggests, is used to measure the cumulative power density level/ electric field strength over a wide frequency range of 450 MHz to 4 GHz in addition to existing 700 MHz – 3 GHz range to accommodate the allocation of 5G NR mid-band (3300 MHz band). If the exposure ratio exceeds 0.5, i.e. 50%,

Frequency Selective method which is further subdivided into

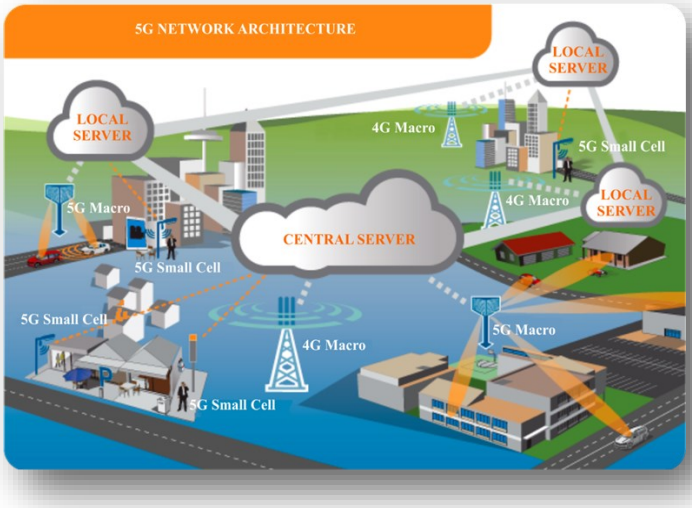
a). Code Selective method

b). Spectrum Analyzer method, shall be adopted.

Along with the conventional broadband method, another approach has been adopted in this Addendum, wherein the 450 MHz – 4 GHz frequency range has been segmented into three sub-ranges, for added flexibility in in-situ measurements at shared sites.

For measurement in mm Wave frequency ranges, frequency selective methods such as code selective and spectrum analyzer methods are much more effective.

Code selective method utilizes a dedicated decoder to measure the power/electric field strength of individual traffic beams.



This helps prevent under/overestimation of extrapolated values. In absence of dedicated decoders Spectrum analyzer method helps in measurement with similar efficacy.

In summary, this newly introduced standard (Addendum) will enable measurement of EMF exposure from 5G Base Stations across all kinds of deployments and aid in ensuring safe EMF exposure levels to the general public.

2. STANDARDIZATION

STANDARDS RELEASED BY TEC:

1. Standard for Generic Requirements (GR) for **"Interface Requirements for Non-Geostationary Orbit (NGSO) Satellite Communication Systems in Fixed Satellite Service (FSS) (Mandatory Technical Requirements)"** was formulated and issued. This standard has been finalized after multiple rounds of consultations with NGSO operators and relevant Ministries and stakeholders. It will aid in deployment of high throughput satellite communication equipment and will ensure that multiple NGSO satellite operators can deploy their network and offer services in the country by facilitating an interference free operating environment and co-existence with other services.
2. An **Addendum to "TEC Test Procedure for Measurement of Electromagnetic Field from Base Station Antenna (TEC 13019:2021)"** was issued for the measurement of EMF Exposure from 5G Base Stations. The document prescribes Broadband and Frequency Selective Methods for EMF exposure assessment from 5G Base Stations. It covers all the frequencies/frequency bands such as sub-6 GHz frequencies and mm Wave frequencies (eg. 26 GHz). This Standard will enable measurement of EMF exposure from 5G Base Stations across all kinds of deployments and aid in ensuring safe EMF exposure levels to the general public.
3. Development Coordination Committee (DCC) Meeting was held on 20.09.2023 for finalization of TEC Standard on Generic Requirements for **"Radio Modem in ISM Band (38050:2016)"**.
4. Provisional Test Guide against TEC GR for **"Millimeter Wave (E-band) Microwave Equipment (36060:2022)"** was issued.
5. TEC has successfully issued a comprehensive standard on **"Fairness Assessment and Rating of Artificial Intelligence Systems." [TEC 57050:2023]** after exhaustive consultations with various key stakeholders, including representatives from Academia, industry, researchers, and domain experts. This standard was released on 07-07-2023 during the national workshop conference aimed at enhancing Indian involvement in global standards bodies within the telecom sector. This Standard enumerates detailed procedures for accessing and rating artificial intelligence systems for fairness.
6. C&B Division issued the Test Guide (Test Schedule & Test Procedure) for Standard on **"Converged Gateway Node For Delivering Broadcast Content To Portable Devices Through Wireless LAN".** The Converged Gateway Node can be used in various scenarios such as Bharat Net in rural areas. Wi-Fi access points through PM-WANI can also deploy Converged Gateway Node so that the broadcast channels are also available to users without using internet data.

TEC has initiated the standardization work in IEEE SA. Following two PAR document(draft) have been prepared and submitted to IEEE for further process;

- Standard for Fairness Assessment and Rating of Artificial Intelligence System.
- Standard for Robustness Assessment and Rating of Artificial Intelligence Systems for Telecom Networks.

PAR stands for Project Authorization Request. It is the means by which standards projects are started within the IEEE SA. PARs define the scope, purpose, and contact points for the new project.

2. STANDARDIZATION

STANDARDS RELEASED BY TEC:

1. Transmission Division issued a Standard of no. **[TEC 85240:2023]** on **"Metal Free Optical Fibre Cable with Double HDPE Sheath for underground duct application (Type-I & Type-II)"** : This document describes the Standard for generic requirements of Metal free Optical fibre cable (Type-I & Type-II) with Double HDPE Sheath for underground installation in ducts. 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.

2. Standard No. **[TEC 85250:2023]** on **"Metal Free Ribbon Optical Fibre Cable with Double HDPE Sheath for underground duct application"** : This document describes the Standard for generic requirements of Metal free Ribbon Optical fibre cable with Double HDPE Sheath for underground installation in ducts. A ribbon shall have six fibres. 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.

3. Revision of GR on Converged Multi-Service Appli cation Access Equipment (The revised standard was released on 28th July 2023. It describes the generic requirements and specifications for network architectures based on Multi Service Application equipment for Access Platform that could be services like PON, Layer-2/Layer-3 ethernet, xDSL, access transport DWDM, 4G/5G services through bridge mode connectivity, etc. It also describes requirements for duplicity check for ONU/ONT and interoperability among OLT & ONUs/ONTs.)

4. Essential Requirements (ER) for **'V-Band Fixed Radio Systems"** has been formulated and issued by Radio Division .

CONTRIBUTIONS TO ITU

- **ITU-R SG-5** (Major Achievement)

India's contribution to 6G Vision Framework, which was earlier accepted by ITU-R's WP5D during the meetings held in June, 2023, has now also been adopted by ITU-R's Study Group-5. During the meetings held on **25-26 September, 2023 in Geneva,** the contributions which were led by TEC, resulted in adoption of India's proposals in the ITU's 6G Framework which includes- **Ubiquitous Connectivity** as dedicated usage scenario and **Coverage, Sustainability** and **Interoperability** as 6G capabilities.

This achievement in global 6G standardization will enable high speed broadband internet for both urban and rural populations for mitigating the digital divide and creating equal opportunities for all through mobile technologies.

- **ITU-T SG-11**

Following 5 contributions have been sent to ITU-T for presenting at ITU-T SG-11 meeting scheduled from 10th-20th October 2023 at Geneva:

1. Proposal for advancement in the baseline text of draft new Technical Report TR-CF-QoS **"Impact of Counterfeit Mobile devices on Quality of Service".**
2. Proposal for updating the Terms of Reference of Q12/11.
3. 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.
4. Proposal to advance the Recommendation ITU-T Q.CEIR.
5. Proposal for a new Technical Recommendation on the technical requirement and im-

2. STANDARDIZATION

• ITU-T SG-12

Shri Piyush Chetiya, DDG(MT) and Shri Venkata Rama Raju Chelle, Director (Quantum Technology) participated from TEC in the ITU-T Study Group 12 meeting held at Mexico City from 19 – 28 September, 2023. The following contributions were presented during the meeting:

1. **E.AIQ - Framework for Quality evaluation of conversational AI (C-AI) system management** Sh. Piyush Chetiya, DDG(MT) and Sh. Venkata Rama Raju Chelle, Director(Quantum Technology), TEC are the editors of this work item initiated by India. The modifications to the draft text proposed were accepted. Further, Q12/12 intends to propose the work item for consent.

2. **E.MVS- Mapping and visualization strategies for the assessment of connectivity and QoS** Sh. Abdul Kayum, DDG is the editor from India for this Work Item. The baseline text for E.MVS was improved in the meeting. Further, 3 e-meetings in November 2023, January 2024 and February 2024 on E.MVS are scheduled for E.MVS. Also, Q12/12 intends to propose the work item for consent.

3. **ITU-T TR-CEC Q2/12 "Framework for Enhanced Quality of Experience by Using Cultural and Emotional Context in Applications Based on Natural Language Understanding"** The representatives from IIT Delhi presented the contribution on the Technical Report.

4. **DFS_Inter: Extended methodology for cross-country and inter-operator Digital Financial Services testing and assessment of QoS and QoE (for the Unified Payment Interface (UPI) developed for India and extendable with global acceptance on an inclusion basis) of Payment Service Providers (PSP) through the Mobile application.** The contribution from India was discussed with the proposal to start a new work item at the next SG12 meeting.

• ITU-T SG-17

Following seven Contributions were submitted to ITU T SG 17 meeting:
The details are given below:

1. Q1/17 - New work item on "Cyber Security Reference Architecture" (CS-RA) by Sh. N. KISHOR NARANG, Narnix Technolabs Pvt. Ltd, Sh. P.K.Singh, DDG(SA),DoT and Mrs. Preetika Singh, DIR (TS), TEC.
2. Q6/17 –Inclusion of text in work item X.mt-feature: "Security features to assess mobile terminal security" by Mrs. Preetika Singh, DIR (TS), TEC.
3. Q14/17 - 3rd Revised baseline text for X.sc-dlt: Security controls for distributed ledger technology" by Mrs. Preetika Singh, DIR (TS), TEC.
4. Q4/17 - Proposed revision of SG17-TD980R3: "Security threats of software supply chain" by Ms. Jyoti Sengar, ADET (TS),TEC and Sh. Shekhar Singh, AD (IOT), TEC.
5. Q7/17 - Proposed revision of SG17-TD942R2: "Security requirements and guidelines of application and service for smart city platform" by Ms. Jyoti Sengar, ADET (TS), TEC and Sh. Shekhar Singh, AD (IOT), TEC.
6. Q6/17 - Proposed Revision of SG17-TD1032 X.sc-iot: "Security Controls for Internet of Things (IoT) systems" by Sh. Sushil Kumar, DDG (IOT) and Sh. Shekhar Singh, AD(IOT), TEC.
7. Q6/17 - Proposed Revision of TD950: X.1352: "Technical Implementation guidelines for IoT devices and gateway" by Ms. Jyoti Sengar, ADET(TS), TEC and Sh. Shekhar Singh, AD (IOT), TEC.

All the contributions were accepted and became Temporary documents of ITU T.

2. STANDARDIZATION

- ## ITU-T SG-20

1. The first meeting of **ITU-T Study Group 20 Regional Group for Asia-Pacific (SG20RG-AP)** was successfully organized under the chairmanship of Mr. Sushil Kumar, Chairman of this group & DDG (IoT) TEC on 25 -26 July 2023. This meeting witnessed active participation of around 120 delegates from 15 countries of Asia Pacific region. Mr. Uma Shankar Pandey, Member (Services) DoT; Mr. Seizo Onoe, ITU TSB director and Mr. Hyoung Jun Kim, ITU-T SG20 Chairman delivered the opening remarks. Mr. R. R. Mittar, Advisor & Head TEC, delivered the closing remarks. This regional group, proposed by India was approved in the ITU-T SG20 meeting, February 2023.

1st meeting of ITU-T Study Group 20 Regional Group for Asia-Pacific (SG20RG-AP) organized under the chairmanship of Sh. Sushil Kumar, DDG (IoT) on 25-26 July 2023

2. ITU-T SG-20 meeting on ***IoT and Smart Cities & Communities*** was held on 13-22 Sept 2023 in Arusha, Tanzania in hybrid mode. Mr. Sushil Kumar, DDG (IoT) TEC participated as head of Indian delegation in physical mode from 18-22 Sept 2023 and virtually for the remaining period. Mr. Dhanesh Goel, ADG (TC) TEC and Mr. MC Sathish Kumar, Director USOF, DoT participated in physical mode from 13-15 Sept 2023 and 18-22 Sept 2023 respectively. Total **nine contributions** (as outcome of SG-20 Regional Group for Asia Pacific meeting, chaired by Mr. Sushil Kumar DDG (IoT), virtually, 25-26 July 2023) submitted by IoT division TEC were presented and discussed in this meeting. The officers of IoT division and few industry members supported Indian delegation remotely in presenting as well as discussing these contributions and participated in other activities. These contributions are on e-learning in remote classrooms, IoT platform enabled by zero trust technology, Smart Agriculture use cases, smart aquaculture use cases, IoT-based power grid communication network, framework for smart public health emergency management, Digital twin for intelligent transport system and new work item on Smart Cities Reference Architecture etc.

3. IoT division submitted four contributions related to IoT security for the **ITU-T SG-17 meeting, Korea, 29 Aug- 8th Sept 2023**. Same were presented virtually and accepted with minor modifications in this meeting. In view of the input given by Mr. Sushil Kumar, editor of work item "IoT Security controls" deferred the submission of document for approval and agreed for changing the content.

4. Officers of IoT division & members from VIT Chennai participated in the 7th meeting of ***ITU/ FAO Focus Group on*** **'Artificial Intelligence (AI) and Internet of Things (IoT) for Digital Agriculture' (FG-AI4A)**, 14th August 2023, virtually.

UPCOMING ITU MEETINGS

S. No.	ITU-T SG	Meeting Date
1	ITU-T SG15	20th Nov– 1st Dec 2023
2	ITU-T SG09	14th -23rd Nov 2023

For more details about ITU events click here

2. STANDARDIZATION

NATIONAL WORKING GROUP MEETINGS/ PROGRESS

• NWG-11

1. 8th & 9th NWG-11 meetings were conducted by Testing And Certification Division on 05/07/2023 and 12/09/2023 respectively.
2. 3 contributions were discussed.

• NWG-12

The 8th and 9th meeting of NWG-12 for the study period 2022-24 was conducted on 11th July, 2023 and 29th August, 2023 respectively. The following existing contributions and the proposed new work items were discussed in the meeting for submission to the ITU-T SG 12 meeting held on 19 -28 September, 2023 in Mexico City:

1. **E.AIQ** - Artificial Intelligence Quotient (AI-Q) for indexing and rating AI algorithms used in conversational AI systems employed for customer service management, service optimization and management as part of service quality assessment methodologies.
2. **E.MVS** - Mapping and Visualisation Strategies for the Assessment of Connectivity and QoS
3. ITU-T TR-CEC Q2/12 "**Framework for Enhanced Quality of Experience by Using Cultural and Emotional Context in Applications Based on Natural Language Understanding**"
4. **DFS_Inter:** Extended methodology for cross-country and inter-operator Digital Financial Services testing and assessment of QoS and QoE (for the Unified Payment Interface (UPI) developed for India and extendable with global acceptance on an inclusion basis) of Payment Service Providers (PSP) through the Mobile application

• NWG-15

One meeting of NWG-15 was conducted on 18th August 2023. Total 3 contributions and the proposed new work-items / revision in existing recommendation were discussed during the meeting.

• NWG-16

1. The contributions of NWG-16 for Q5/16 were accepted in ITU-T SG16 meeting held in Geneva during 10-21 July, 2023.
2. Sixth meeting of NWG-16 was held on 24.08.2023.

• NWG-20

Five virtual meetings of National Working Group- 20 (NWG-20) were held on 3rd July 2023, 10th July 2023, 20th July 2023, 16th August 2023 and 28th August 2023 to discuss and finalize contributions for the ITU-T SG-20 meeting, 13-22 September 2023.

For more information about National Working Groups (NWGs) activities click here

Link- https://tec.gov.in/scp/

DETAILS OF IMPORTANT UPCOMING EVENTS

- **Sub-DCC & MF meeting of IT Div scheduled on 26.10.2023 for revision of GRs – PTP GM, PTP Slave and NTP server**

- The "**Second International Quantum Communication Conclave**" to be organized by TEC in collaboration with C-DOT and TSDSI is scheduled to be held on **15-16 February, 2024, New Delhi.**

2. STANDARDIZATION

TECHNICAL REPORT PUBLISHED BY TEC

- Mr. Uma Shankar Pandey, Member (S), DoT released TEC Technical Report EMF Radiation from IoT/ M2M devices (TEC 31208:2023) on 26th July 2023 in presence of Mr. Ajay Kumar Sahu, Advisor (O), DoT; Mr. R. R. Mittar, Advisor & Head, TEC and other officers of TEC. This report has been prepared by a Working Group of IoT division chaired by Mr. Sushil Kumar, DDG (IoT), in view of the requirement sent by CS division, DoT. This report includes study of national/ international standards, guidelines, policy, regulation and best practices by various international organizations/ countries on EMF Exposure and SAR limits. It also provides recommendations to related stakeholders on criteria for exclusion from RF assessment and adoption of safe RF exposure limits as per national and international guidelines.

- A Technical study on '**Planning and Deployment of 5G services in India and RF-EMF exposure limits for Base Station Antennas'** has been initiated by TEC and is being carried out by **CeWiT, IIT Madras**. The primary objective of this simulation study is to understand the effect of existing EMF Exposure Norms in India on 5G network performance, assessed in terms of network coverage, throughput and capacity.
- TEC is working on publishing a technical report on **"Television Broadcasting to Mobile Handheld Devices - Direct to Mobile (D2M) Broadcasting"** bringing out the features, deployment status, technology maturity, etc., of different technologies. The aim is to create general awareness amongst the stakeholders/ policymakers on this emerging technology landscape. In this regard, TEC released the draft report and sought the comments/ suggestions from stakeholders by 08.09.2023 which has been further extended up to 25.09.2023.

Release of TEC Technical Report '*EMF Radiation from IoT/ M2M devices*', on 26th July 2023 by Sh. Uma Shankar Pandey, Member (S), DoT in presence of Sh. Ajay Kumar Sahu, Advisor (O)

3. TESTING AND 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 like SAR, IPv6 etc before its sale, import or use in India.

a) **FRESH Certificates issued:**

Quarter Q2 = 252	Total = 1075 (till 29.09.2023)

b) **Modified/Renewed Certificates issued:**

Quarter Q2 = 42	Total = 129 (till 29.09.2023)

c) **Status of OEM registration:**

Indian OEM	17 (Total=135 till 29.09.2023)
Foreign OEM	15 (Total=184 till 29.09.2023)

For more details about MTCTE **Click here**

Link- https://www.mtcte.tec.gov.in/

CAB DESIGNATION ISSUED:

- **CAB designations issued -**

New = 03	Renewed = 02

- **Total Designated CABs = 60 (as on 31.09.2023)**

IT Safety = 41	EMI/EMC = 31
SAR Testing = 04	Environmental = 24
O.F.(single mode) =01	Optical Fiber Cable =01
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

- **Technology Approval Certificate** was issued to C-DOT for **the Point to Point Quantum Key Distribution System using COW and DPS protocols developed by C-DOT**.
- **PoC Testing** of the Secure VC Solution using Post Quantum Cryptography (PQC) between TEC, C-DOT and DOT HQ was carried out by TEC.
- M/s Altruist Technologies Private Limited, Ambala Haryana has been designated as domestic lab for testing of Conditional Access System (CAS) and Subscriber Management System (SMS) used for Broadcasting and Cable TV services vide TEC letter no. 9-1/2023-C&B/TEC dated 27.07.2023.
- **C&B Division** has issued a certificate for C-DoT CAS.
- IP MPLS Link connection between TEC New Delhi and NCCS Bengaluru for Security Lab established on 27.09.2023.
- Evaluation of Labs (M/s CN Labs, Bengaluru and M/s Compliance International Labs, New Delhi) done for enhancement of scope for CAB Designation.
- M/s Alpha Test House Lab site visit by committee on 02nd to 04th Aug 2023 & report submitted.
- M/s Compliance Int. Lab site visit on 16 Aug 2023 by committee & report submitted.
- CAB Designation Assessment case of M/s Granite River Labs India Services Private Limited, Bengaluru, submitted .
- Technology approval of MiniOLT (Office OLT -2)(TEC has issued a certificate for CDOT 4-PON port GPON Mini-OLT (Office OLT-2) and ONT 23/23A/17A/24 on 21 July 2023.)
- Technology approval of MiniOLT (Office OLT -3)(TEC has issued a certificate for CDOT 4-PON port GPON Mini-OLT (Office OLT-3) and ONT 17A/27/28 on 1st September 2023.)

VOLUNTRY TESTING

3 Type Approval, 5 Interface Approval, 1 Certificate of approval and **5 technology Approval Certificates** issued under Voluntary testing scheme during the quarter (Q2 i.e. 01 July-30 Sep 2023). Total **50 certificates** issued till 30.09.2023 (23 Type Approval, 15 Interface Approval, 2 Certificate of Approval and 10 Technology approval) since 01.04.2021.

4. KNOWLEDGE DISSEMINATION

TRAINING/ WORKSHOP/ WEBINAR/ TALKS

1. Telecommunication Engineering Centre (TEC), in collaboration with C-DoT and TSDSI, successfully conducted the "**National Workshop on Enhancing Indian Participation in Telecom Global Standards Bodies"** on 7th July 2023 at the C-DoT Campus. The organizing committee for this event was Chaired by the Deputy Director General (RC). Wherein:

- Online Module for Voluntary Certification of telecom products introduced
- Standards Coordination Portal, to serve as a central hub for sharing information and promoting collaboration in Standardization in telecom and related ICT domains launched
- TEC standard on Fairness Assessment and Rating of Artificial Intelligence Systems Unveiled
- Approval Certificate for Conditional Access System and the Technology Approval Certificate for Dual Band Outdoor Wi-Fi Access Point, was handed over to C-DoT, symbolising their commitment to quality and innovation.

Speaking on this occasion, Secretary Telecom emphasized that India has to play a leading role in the global telecom standardisation efforts. He suggested organising such events annually to bring industry, academia, startups and government organisations together for this purpose. His address focused contribution of research to economy and India becoming producers of Technology.

The workshop featured esteemed speakers and experts from industries, academia, government organization's, and renowned research and development center's. Engaging discussions revolved around topics such as the step-by-step process of standard-making processes, conversion of patents into Standard Essential Patents (SEPs), and the significant role of academic institutions in fostering a vibrant Standards Community

Participants gained insights into the structure and significance of National working groups corresponding to these international Standardizations organization's. The event provided a platform to raise awareness and encourage active Indian participation in international standardisation bodies such as ITU, 3GPP, IEEE etc. The workshop emphasized the pivotal role of standardization for businesses and start-ups, particularly through the Standard Essential Patents (SEP) mechanism.

Acknowledging the profound importance of contributing to global standards, the workshop aimed to strengthen India's standing not only in the telecom domain but also in the international arena as a whole. The event fostered collaboration, knowledge sharing, and innovation, empowering Indian stakeholders to actively contribute to shaping global standards.

4. KNOWLEDGE DISSEMINATION

2. **DDG (RC)** spoke on **"5G going onto 6G Capability Mapping"** at the Technation2023 conference, which was held on 14th September 23 , organized by DSCI.

"5G going onto 6G Capability Mapping" at the Technation2023 conference on 14th September 2023 "

3. Mr. Sushil Kumar, DDG (IoT), TEC delivered a talk on **IoT Activities in India in the ETSI IoT Conference 2023 (ETSI IoT Week),** virtually on 5th July 2023.

4. DDG (IoT), TEC delivered a talk on **M2M/ IoT Standardization and use cases including IoT Security in the Regional Workshop on M2M/ IoT Security & Use Cases**, virtually, organized by AP LSA, Hyderabad on 28th July 2023.

5. Mr. Sushil Kumar, DDG (IoT), TEC delivered a talk on **IoT and 5G Security in the International Conference on 5G Network Security**, organised by NCCS Bengalore & C-DOT on 9-10 August 2023. Same was also attended by other officers of IoT division

6. DDG (IoT), TEC delivered a talk on **M2M/ IoT Standardization and use cases including IoT Security in the Regional Workshop on M2M/ IoT Security & Use Cases**, organized by Rajasthan LSA, Jaipur on 18th August 2023 with the support of TEC/ DoT.

7. **CA Division,** TEC in Collaboration with TIC (Testing, Inspection and Certification) Council, India organised a "**Dialogue on Building Testing Ecosystem in India: Way forward**" at 15:00 hrs on 07.08.2023 at Manak Conference Hall, Ground Floor, TEC under the august presence of Advisor, TEC. Ms. Hanane Taidi, Director General, TIC Council was the guest of Honour. The event was attended by TIC Council India members like UL India Pvt. Ltd., TUV Rhineland (India) Pvt. Ltd., SGS India Pvt. Ltd. Bengaluru, TUV SUD India, Intertek India and All officers of TEC up to JTO level attended the event. In addition, M/s AAEMT Laboratory, Gurugram and M/s Nemko India Test Lab Pvt. Ltd. Faridabad also attended the event.

8. Sub-DCC meeting for revision of GRs on **"Optical Fibre Splicing Machine and Ribbon Optical Fibre Splicing Machine"** was held on 22.08.2023.

9. MATCOF meeting for revision of **"ER of Optical Fibre Cable"** was held on 22.09.2023.

10. Global Workshop on **"Advances in Optical Communications"** was held in IIT Chennai on 22nd and 23rd July 2023.

11. TS division has organized an interactive session with IIT BHU on 27.09.23 for **"Enhancing Academia Participation in ITU and Standard Bodies".**

12. Dr. Rajesh Sharma, Counsellor to PMI Geneva and Sh. Premjit Lal ,DDG(IR) has also expressed his views during the session virtually.

5. EXTERNAL ENGAGEMENTS

1. Mr. Sushil Kumar, DDG (IoT) chaired the 25th meeting of BIS LITD 27 "Internet of Things & Digital Twin" 6th September 2023 in BIS, for preparing contributions for the ISO/IEC JTC 1/ SC 41 meeting, Nov 2023. This meeting was attended by several industry members including officers of IoT division TEC. It is worth mentioning that Sh. Sushil Kumar, DDG (IoT) has been felicitated by Hon'ble Ministers- Sh. Piyush Goyal ji and Sh. Ashwini Choubey ji for the excellent work done by him in the field of Standardisation, as chairman of LITD 27.

Felicitation of Sh. Sushil Kumar, DDG (IoT) by Hon'ble Ministers- Sh. Piyush Goyal ji and Sh. Ashwini Choubey ji for the excellent work done by him in the field of Standardisation, as chairman of BIS committee LITD 27 on 'Internet of Things and Digital Twin' on World Standards Day 2023.

2. In response to the comments submitted by IoT division of TEC, The LITD 17/Panel 5 'IoT Security and Privacy' Panel BIS has recommended the following :

- To drop its standards LITD 17(19140) and LITD 17 (19141) and to adopt ISO/IEC 27400 as Indian standard.
- To move content of LITD 17 (19141) related to levels of Assurance to LITD 17 (19143).
- To have inputs from members regarding number of levels for Assurance.

It is an important development on the basis of comments submitted by TEC and the recently released **Technical report on Security by Design for IoT device Manufacturers**.

3. 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 has successfully developed a comprehensive standard on **"Fairness Assessment and Rating of Artificial Intelligence Systems." [TEC 57050:2023].** TEC is willing to work in collaboration with Stakeholders (Academia/ R&D Organisations/ Others) and have identified some opportunities/areas of collaboration. This collaborative aims to establish a robust framework for evaluating and certifying the fairness and reliability of AI technologies. A draft MoU for cooperation in the field of trustworthy AI has been prepared and published at TEC website.
4. **CA DIVISION** vide e-mail dated 10.07.2023 has sent the inputs in reference to **First Meeting of India-UK Strategic Tech Dialogue- Telecom Track** on the point **"Connecting UK and Indian Telecom Labs"**.
5. **CA DIVISION** DDG wrote a letter to Director (Operations), BBNL on dated 08.08.2023 regarding the provision of C-DoT to provide the access of Bharatnet NoC for NIS operational purposes so that the surveillance of G-PON Products inducted in the network can be carried out in effective way.

5. **TS DIVISION** collaborated with BIS joint session of 16th Meeting on 11.09.2023 on Audio, video and multimedia systems and equipment Sectional committee, LITD 07.

6. **IT DIVISION's** External engagement are

- Comments on tech specs of LAPTOPs provided to Admin
- Query reply sent to RC Division on Type Approval case of HFCL LAN Switch.
- Reply to RTEC SR, Bengaluru regarding Customs queries sent by email-23.08.2023
- Comments sent to NGN Division on CoA Enquiry case of Software based EPABX system-23.08.2023
- Comments given to IMP-TEP Division on HS Code case received from DoT Hq – 23.08.2023
- Committee report on technical evaluation of bids for purchase of All-in-one PCs on 29.08.2023.
- 4G PoC testing by Director (IT-II) in BSNL Punjab at Ferozepur & Pathankot w.e.f . 25.09.2023
- Risk and opportunity and mitigation report submitted for Potential Non-Compliance (PNC) raised during ISO 9001:2015 external audit.

6. SIGNIFICANT ACHIEVMENT

TS DIVISION

- Ms. Jyoti Sengar, ADET(TS) has attended the Study Group-17 meeting in Goyang, Korea from TEC.

TC DIVISION

- Notifications dated 03.07.2023 issued for Extension of exemption for various parameters of ER under MTCTE.
- Notification dated 20.07.2023 issued regarding exemption/ self-declaration/ test results for various PON parameters.
- Amendment notification dated 27.09.2023 issued for Extension of mandatory date of certification for 32 products (ERs) covered under MTCTE Phase-III & Phase-IV by 3 months i.e. from 01.10.2023 to 01.01.2024.

QT DIVISION

- Sh. Venkata Rama Raju Chelle , Director (Quantum Technology) participated in **3GPP SA3 meeting** and provided inputs on **Rel.19 Enablers for Zero Trust Security (eZTS)** Study proposal.
- **Sh. Rakesh Goyal , ADET** (Quantum Technology) was deployed on temporary duty with G-20 secretariat from August 16 – September 10 for organization and conduct of the **G20 summit.**

RC DIVISION

- Voluntary Certification Module (for Type Approval/Interface Approval only) launched on 07.07.2023 by Secretary (T).

C&B DIVISION

- **Constitution of Consultative Committee (CC):** TEC has a policy for adoption of standards of Telecom Standards Development Society, India (TSDSI)/international standards bodies into national Standards. Further, TEC has received TSDSI adopted ATSC 3.0 standards for its adoption as national standard. As per process, a Consultative Committee (CC) has been constituted by TEC vide OM no. 12-1/2023-C&B/ TEC dated: 20.09.2023 based on the nominations received from stakeholders.

TEC WELCOMES

Ms. Tripti Saxena Sr. DDG

7. हिन्दी गतिविधियाँ

दूरसंचार अभियांत्रिकी केंद्र, नई दिल्ली में 14 से 29 सितंबर, 2023 तक हिंदी पखवाड़ा का आयोजन सफलतापूर्वक किया गया । हिंदी पखवाड़े के उदघाटन समारोह का आयोजन 14 सितंबर, 2023 को डॉ. अब्दुल कलाम सभागार में किया गया । उदघाटन समारोह में परंपरागत सरस्वती पूजा व दीप प्रज्वलित कर **श्रीमती तृप्ति सक्सैना, वरिष्ठ उप महानिदेशक, टी.ई.सी.** द्वारा हिंदी पखवाड़ा-2023 का विधिवत उदघाटन किया गया । इस अवसर पर श्रीमती सक्सैना जी ने माननीय गृह मंत्री, भारत सरकार श्री अमित शाह जी, द्वारा हिंदी दिवस के उपलक्ष्य में जारी संदेश से सभी अधिकारियों/ कर्मचारियों को अवगत कराया और हिंदी दिवस की शुभकामनाएं दी तथा हिंदी दिवस की महता पर प्रकाश डाला । अध्यक्षा महोदया द्वारा पखवाड़े के दौरान आयोजित प्रतियोगिताओं में बढ़-चढ़कर भाग लेने तथा इस पखवाड़े के दौरान ही नहीं अपितु पूरे वर्ष हिंदी में ही कार्य करने हेतु सभी से आग्रह किया गया ।

कार्यालय में हिंदी को बढ़ावा देने तथा अधिकारियों एवं कर्मचारियों में हिंदी के प्रति रूचि सृजित करने के उद्देश्य से हिंदी पखवाड़ा के दौरान कुल 9 प्रतियोगिताओं का आयोजन किया गया । हिंदी पखवाड़े के दौरान आयोजित, प्रश्न मंच प्रतियोगिता को छोड़कर, प्रत्येक प्रतियोगिता के विजेताओं को क्रमश: प्रथम, द्वितीय और तृतीय पुरस्कार तथा 03 सांत्वना पुरस्कार दिये गए।

7. हिन्दी गतिविधियाँ

हिंदी पखवाड़े के समापन समारोह का आयोजन डॉ. अब्दुल कलाम सभागार में दिनांक 29 सितंबर, 2023 को किया गया ।

- पुणे में आयोजित अखिल भारतीय राजभाषा सम्मेलन -2023 एवं हिन्दी दिवस - 2023 के कार्यक्रम में टीईसी के दल मे निदेशक (सी&बी) भी सम्मिलित रहे।

8. 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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