

# NEWSLETTER

TELECOMMUNICATION ENGINEERING CENTRE

## MESSAGE



From the desk of....

**Advisor & Head, 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. Its a great pleasure to share that TEC has successfully organized the "First International Quantum Communication Conclave" at Vigyan Bhawan, New Delhi from 27-28 March, 2023 in association with C-DoT, TSDSI and IEEE Communications Society Delhi Chapter. The event was inaugurated by Sh. Ashwini Vaishnaw, Hon'ble Minister of Railways, Communications, Electronics & IT.

I believe that this newsletter for January–March 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



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# FIRST INTERNATIONAL QUANTUM COMMUNICATION CONCLAVE



Hon'ble Minister of Railways, Communications and Electronics & IT, Shri Ashwini Vaishnaw inaugurated **"First International Quantum Communication Conclave"** in the august presence of Sh. Devusinh Chauhan, Hon'ble Minister of State for Communications; Prof. Ajay Kumar Sood, Principal Scientific Adviser to Govt. of India and Secretary (Telecom), Department of Telecommunications.

## Key Takeaways:

- Organized by TEC in association with C-DoT, TSDSI and IEEE Communications Society-Delhi Chapter.
- Hon'ble MoC and Hon'ble MoSC in presence of Secretary (Telecom) also inaugurated the **exhibition of Quantum products** during the Conclave.
- Hon'ble MoC also presented the **Pandit Deendayal Upadhyaya Telecom Skill Excellence Awards – 2022** for the outstanding contributions in the areas of telecom skilling, services, manufacturing and applications.
- With an objective to find vulnerabilities in QKD, PQC solutions as well as to further strengthen the Quantum Ecosystem in India, the Quantum Hackathon 2023 was announced by Hon'ble MoC. with a prize of INR 10 Lakh for each break into the QKD or PQC systems and an opportunity to further collaborate with C-DOT.
- Attended by more than 700 participants and featured keynote speeches, panel discussions, and demonstrations by national and international experts from Industries, Start-ups, Govt. Organizations, Academia, and Research institutions focusing on the recent developments in quantum communication technologies, global trends, standardization efforts, and possible applications of Quantum Technologies to build a secure communication infrastructure.

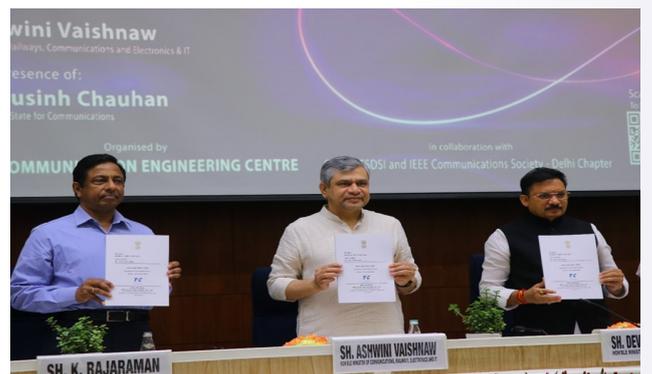


# SOME GLIMPSE OF FIRST INTERNATIONAL QUANTUM COMMUNICATION CONCLAVE



RELEASE OF TEST GUIDE FOR “QUANTUM KEY DISTRIBUTION SYSTEM” (NO: TEC 91001:2023) BY HON'BLE MOC WITH HON'BLE MOSC IN PRESENCE OF SECRETARY (TELECOM)

RELEASE OF STANDARD FOR “CLASSICAL AND QUANTUM-SAFE CRYPTOGRAPHIC SYSTEMS (NO: TEC 91010:2023) BY HON'BLE MOC WITH HON'BLE MOSC IN PRESENCE OF SECRETARY (TELECOM)



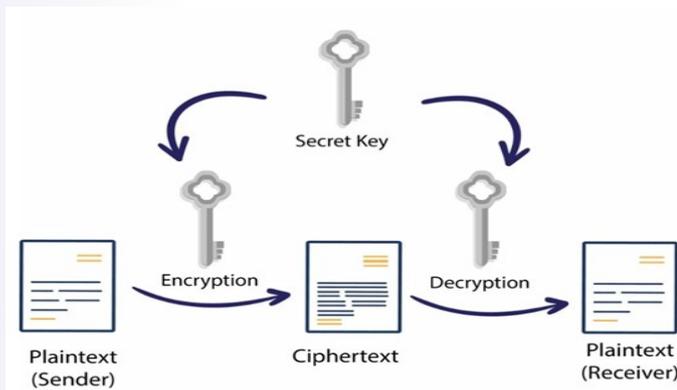
# TECHNOLOGY

## QUANTUM SAFE CRYPTOGRAPHY AND SECURITY

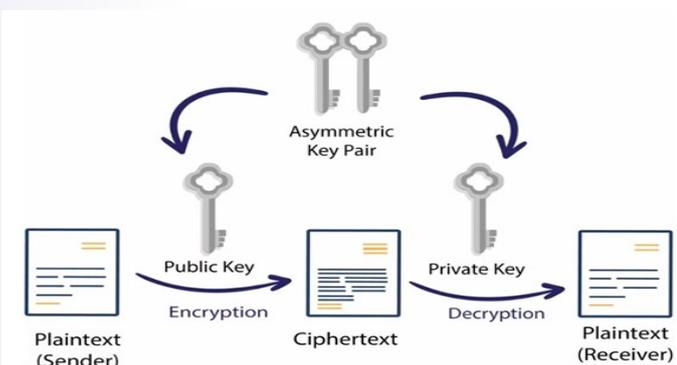
### 1. Introduction to Cryptographic systems:

Cryptography is the practice of securing communication and protecting data from unauthorized access by converting plaintext into ciphertext using mathematical algorithms, making it unintelligible to anyone without the proper key. It plays a critical role in securing our digital infrastructure. Cryptographic Algorithms are broadly classified as:

**1.1 Symmetric Key Cryptography:** Secret Key Cryptography, or symmetric cryptography, uses a single key to encrypt data. Examples are Advanced Encryption System (AES), Data Encryption Standard (DES), etc.



**1.2 Asymmetric Key Cryptography:** In asymmetric key cryptography, a pair of keys is used to encrypt and decrypt information. A public key is used for encryption and private key is used for decryption. Even if the public key is known by everyone, the intended receiver can only decode it because he alone know his private key. The popular asymmetric key cryptography algorithms are RSA algorithm, Elliptic-curve cryptography (ECC), Diffie Hellman (DH), etc



**1.3 Hash Functions:** There is no usage of any key in this algorithm. A hash value with fixed length is calculated as per the plain text which makes it impossible for contents of plain text to be recovered. It used in information security to authenticate transactions, messages, and digital signatures. Example: Secure Hash Algorithm (SHA)

### 2. Quantum Computing and the risk to Security and Privacy:

The advent of large-scale quantum computing offers great promise to science and society, but brings with it a significant threat to our global information infrastructure. Public-key cryptography - widely used on the internet today - relies upon mathematical problems that are believed to be difficult to solve given the computational power available now and in the medium term. However, popular cryptographic schemes based on these hard problems – including RSA and Elliptic Curve Cryptography – will be easily broken by a quantum computer. For example, quantum algorithms like Shor’s for factoring and Grover’s for search can break cryptographic schemes like RSA. This will rapidly accelerate the obsolescence of our currently deployed public key infrastructure and will have dramatic impacts on any industry where information needs to be kept secure.

**Table: Impact of Quantum Computing on common cryptographic algorithms**

S. N	Cryptographic Algorithms	Type	Purpose	Impact of the large scale quantum computer
1	AES	Symmetric Key	Encryption	Larger key sizes needed
2	SHA-2, SHA-3		Hash functions	Larger output needed
3	RSA	Public key	Signatures, key establishment	No longer secure
4	ECDSA, ECDH	Public key	Signatures, key exchange	No longer secure

# TECHNOLOGY

### 3. Introduction to Quantum-safe Cryptography:

Quantum safe cryptography, also known as post quantum cryptography (PQC), is a new generation of the public-key cryptographic system that is undergoing NIST evaluation. These new quantum cryptographic algorithms are based on hard mathematical problems that based on current research, even large quantum computers cannot break. The PQC schemes can be either code-based, hash-based, lattice-based, multivariate based as detailed below:

**3.1 Lattice-based Cryptography:** Lattice-based cryptography is the generic term for constructions of cryptographic primitives that involve lattices, either in the construction itself or in the security proof. Lattice-based constructions are currently important candidates for post-quantum cryptography.

**3.2 Code-Based Cryptography:** Code-based cryptography has its security relying on the hardness of problems from coding theory, for example, syndrome decoding (SD) and learning parity with noise (LPN). These cryptosystems are based on error-correcting codes to construct a one-way function. The security is based on the hardness of decoding a message which contains random errors and recovering the code structure.

**3.3 Hash-based Cryptography:** Hash-based cryptography focuses on designing digital signature schemes based on the security of cryptographic hash functions, e.g., SHA-3. These schemes are based on the security of hash functions (as a one-way function, collision-resistant property, and hardness of second pre-image attacks), and require fewer security assumptions than the number-theoretic signature schemes (e.g. RSA, DSA).

**3.4 Multivariate Cryptography:** Multivariate cryptography has its security relying on the hardness of solving multivariate systems of equations. These schemes are based on systems of multivariate polynomial equations over a finite field  $F$ .

### 4. Post-Quantum Cryptography Standardization:

The National Institute for Standards and Technology (NIST, USA) initiated a process to solicit, evaluate, and standardize quantum safe algorithms. After the three rounds of PQC Competition, NIST has selected four cryptographic algorithms for PQC Standardization as detailed below:

Algorithm	Purpose	Type
CRYSTALS-KYBER	Public-key Encryption and Key-establishment Algorithms (used for establishing a shared secret encryption key)	Lattice
CRYSTALS-DILITHIUM	Digital Signature Algorithms (used for authentication)	Lattice
FALCON		Lattice
SPHINCS+		Hash-based

Three additional algorithms are under consideration in the fourth round of the NIST evaluation process: Classic McEliece, BIKE, and HQC.

### 5. Approaches to PQC Migration:

Security of current PQC algorithms cannot be fully verified today. So, in coming years both traditional algorithms and PQC algorithms may be relied upon. Hybrid mode consisting of one traditional algorithm and one post quantum algorithm is a best solution for smooth migration to quantum-safe solution.

#### Do You Know?

Country's first quantum computing-based telecom network link is now operational between Sanchar Bhawan and National Informatics Centre office located in CGO Complex in the national capital. Hon'ble MoC, Sh Ashwini Vaishnaw has announced a Rs 10 lakh prize money for ethical hackers who can break the encryption of the system.

# STANDARDIZATION

## STANDARDS RELEASED BY TEC:

1. Generic Requirements (GR) for “**Converged Gateway Node For Delivering Broadcast Content To Portable Devices Through Wireless LAN**”. (No. TEC 57040:2023): This standard is for Converged Gateway Node for delivering broadcast content to portable devices through Wireless LAN/Wi-Fi. The end users can view the television or other audiovisual content on their portable devices without consuming Mobile/Internet/Broadband data and without requiring any additional hardware or plugin, etc.

2. GR for “**50G Higher Speed PON System for FTTx based Broadband applications**”. (No: TEC 71110:2023): This standard describes specifications for higher speed Passive Optical Networks (HS-PON) based on FTTx architectures that operate at speeds of over 10 Gbit/s per channel and upto 50 Gbit/s per channel, for residential, business, mobile backhaul, and other applications.

3. Test Guide for “**50G Higher Speed PON System for FTTx based Broadband applications**”. (TEC 71111:2023)  
It describes the Test procedures and Test cases for higher speed Passive Optical Networks (HS-PON) based on FTTx architectures that operate at speeds of over 10 Gbit/s per channel and upto 50 Gbit/s per channel, for residential, business, mobile backhaul, and other applications.

4. GR for “**Radio Over Fiber System**” (No: TEC 71130:2023 ): This standard describes a fundamental architecture and requirements for RoF systems as per ITU-T G.9803 for use in Indian telecom network. RoF system is capable to transmit waveform information over an optical fibre network for radio communication services.

5. GR for “**eNodeB for 5G NSA**” (No: TEC 21070:2023): It describes requirements for eNodeB for LTE based mobile system suitable for 5G NSA (Non-Stand alone) deployment in the Indian mobile communication networks.

6. GR for “**5G Core**” (No: TEC 22160:2023): This Standard is for 5G Core based mobile system suitable for 5G Stand alone deployment in the Indian mobile communication n/w.

7. GR for “**Compact 5G Mobile System**” (No: TEC 23090:2023) :This Standard is for Compact 5G Mobile system which may be called by other names like “5G Network in One Box (5G NIOB)” or “5G Network in a Box (5G NIB)” etc.

8. Standard for “**Design and Standard for Common Duct and Post Infrastructure along Highways and public pathways**” (No: TEC 81006:2023): This standards is for laying down Common Duct and Post Infrastructure along Highways and public pathways for facilitating sharing of ducts and posts infrastructure.

9. Revision of Standard for “**Specific Absorption Rate (SAR) for Wireless Communication Device used in close proximity to human body**” (No: TEC 13016:2020)”

10. Revision of Essential Requirements (ER) for “**E-Band Fixed Radio Relay Systems**” .

11. Revision of Essential Requirements (ER) for “E-Band Fixed Radio Relay Systems”.

12. Revision of Six number of Essential Requirements (ERs) namely **Router, LAN Switch, Infiniband Switch, IP Security Equipment, IP Multimedia Conferencing Equipment & Server**.

13. Revision of Test Guide for -

i) **Optical Dispersion Analyser** (TEC 88031:2023)

ii) **Optical Spectrum Analyser** (TEC 88081:2023)

iii) **Aerial Drop Optical Fibre Cable for Last Mile Applications** (TEC 85221:2023)

## STANDARD ADOPTION

1. TEC has adopted 3GPP Release 17 standards (TSDSI transposed) related to 5G (total 1227 documents) into National Standards.

2. TEC has initiated the process for adoption of following 3GPP standards (TSDSI transposed)-

i) **Release 13 to 17 (total 1546 documents)**

ii) **Release 15, 16 and 17 (total 2579 documents)**

# STANDARDIZATION

## CONTRIBUTIONS TO ITU

### • ITU-T SG2

1. An Indian contribution proposing **amendments to ITU-T Rec E.156** was presented by **Sh Tejpal Singh**, Advisor TRAI during the SG2 meeting held in March 2023. This contribution proposes to revise Appendix I and Appendix II of E.156 under work item E.156.

**Outcome:** Incorporated into the prior base text. The meeting called for contributions to progress further work on this new baseline text. **Q1/2 appointed Mr. Tejpal Singh (India) as the new Editor of Rec. ITU-T E.156**

2. The SG2 meeting also revisited this updated text of **TR.MMWF** based on inputs from the Russian Federation, India and Telecom Italia.

### • ITU-T SG3:

Seven contributions were submitted from India in ITU-T SG3 meeting held in March 2023.

**Significant Outcome:** Based on Indian Contribution, The ITU-T **Focus Group on Costing Model for Affordable Data Services** was established under ITU-T SG3.

### • ITU-R WP5D:

The following five contributions were submitted to ITU-R WP 5D 43rd meeting held during 31 Jan to 9 Feb, 2023 -

1. Update to the Working document towards a Preliminary Draft New Report **ITU-R M.[IMT.APPLICATIONS]**
2. Modifications to Working document towards a Preliminary Draft New Report **ITU-R M.[IMT2020.UNWANT.BS]**
3. Update to the Working Document towards a Preliminary DraftNew Rec **ITU-R M.[IMT.VISION 2030 AND BEYOND]**
4. Revision of the working document towards the revision of Resolution **ITU-R 65**
5. Modifications in Preliminary Draft revision of Recommen-

ation **ITU-R M.1036-6.**

**Outcome:** All these contributions were suitably incorporated in the ITU-R WP5D working documents.

ITU-T has published revised Recommendation **K.80 "Electromagnetic compatibility requirements for telecommunication network equipment in the frequency range 1 GHz-40 GHz"**. This work item for revision of ITU-T K.80 was initiated by India in 2022 under ITU-T SG-5. This revised K.80 covers EMC requirements upto 40 GHz. Mr. Anshul Kumar Gupta, AD (CA) TEC, DoT has created this work item and as Editor of the work item contributed significantly in finalization of this recommendation.

### • ITU-T SG9

Two contributions related to **CAS** were submitted in ITU-T SG9 RGM Q2/9 meeting on 10 February 2023.

### • ITU-T SG12

The following three contributions from India were presented by Sh Abdul Kayum, DDG (6G) and Sh Piyush Chetiya DDG (FN) in the SG12 meeting held from 18-26 January 2023:

1. **E.AIQ (Q12/12)** – AI 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 (Q12/12)** - “Mapping and visualization strategies for the assessment of connectivity and QoS”
3. A new work item titled “**Framework for Enhanced Quality of Experience by using Cultural and Emotional Context in Applications based on Natural Language Understanding**”.

# STANDARDIZATION

## • ITU-T SG13

Following five contributions were submitted and presented to SG13 meeting held from 13-24 March 2023 and all have been accepted:

1. Draft new Supplement to ITU-T Y-series Recommendations: "Standardization roadmap on Quantum Key Distribution Networks" has been accepted as recommended under Q16/13;
2. Draft new Recommendation ITU-T Y. Trust-Registry: "Trust Registry for Devices and Applications: requirements, architectural framework" has been accepted as recommended under Q16/13;
3. Draft Recommendation Y.ML-IMT2020-MLFO "Architectural framework for MLFO in future networks including IMT-2020" under Q20/13
4. Draft new Recommendation ITU-T Y.Arch\_NGNe\_ncp: "Architectural evolution for NGN control plane by applying SDN technology" has been accepted as recommended under Q2/13; and
5. Supporting contribution for extension of lifetime of Focus Group on Autonomous Networks " has been accepted as recommended under QALL/13.

## • ITU-T SG17

The meeting of ITU-T Study Group-17(Security) was held from 21 February to 23 March 2023 at ITU HQ Geneva. Smt. Preetika Singh, Director (TS) attended the meeting and presented following contributions.

1. **X.SC.DLT** (Security Controls of Distributed Ledger Technology). This pertains to Q14 of SG17. The contribution was accepted as TD 940. Smt. Preetika Singh, Director (TS) is the editor of this work item.
2. **X.5Gsec-srocv**: Security Requirements for the Operation of 5G Core Network to Support Vertical Services: This pertains to Q2 of SG 17. The contribution is accepted as TD 969. Smt. Preetika Singh, Director (TS) is also the editor of this work item.

3. **X.sc-iot: (Q6/17)**: Security Controls for Internet of Things (IoT) systems presented by IoT division.

The contribution was **finalized as TD 1032**.



## • ITU-T SG20

- Officers of IoT division and industry members participated in SG-20 meeting, Geneva, 30 Jan- 10 Feb 2023. Six contributions were submitted and presented in this meeting.

1. Work item on **IoT and ICT Requirements for deployment of smart services in rural communities approved as ITU-T standard** and is under publication as ITU-T Recommendation **Y .4218 (02/2023)**. Mr. Sushil Kumar, DDG (IoT) and Ms. Namrata Singh, ADG (IoT) worked as editors in this work item.
2. **Indian proposal for Creation of SG20 Regional Group for Asia Pacific region approved by SG-20**, resulting in **creation of this group** and also the name of Mr. Sushil Kumar, DDG (IoT) approved as the Chairman of this regional group.
3. New work item **Requirements, capabilities and architectural frameworks for e-learning in remote classrooms** approved by SG-20.
4. Three other contributions in this meeting related to **Smart Agriculture use cases, Smart education and Industrial IoT** were well appreciated and included with minor modification in the related TDs.

# STANDARDIZATION

## • ITU-T SG20

- Officers from IoT division and professors from VIT Chennai participated in the 5th meeting of ITU/ FAO Focus Group on 'AI and IoT for Digital Agriculture' (FG-AI4A), 20 Jan 2023, virtually. Revision of two contributions on the ongoing work as use cases namely **Applications of Drones, AI and IoT in Cashewnuts farming and IoT based Farmland Surveillance System with Disease Detection in Paddy Crops**, based on the projects in VIT Chennai, submitted / presented jointly, were approved in this meeting. **India is having four positions in this group.**

## TECHNICAL REPORTS

Secretary (T), DoT has released Technical Report **Security by design for IoT Device Manufacturers** (TEC 31328:2023) prepared by IoT division TEC, on 31st March 2023. This report highlights various threats and challenges related to IoT device security; includes study of national/ international standards, best practices and guidelines to mitigate these challenges. This report also provides recommendations for IoT device manufacturers and related stakeholders which will help in securing IoT ecosystem in the country.



## UPCOMING ITU MEETINGS/ EVENTS

S. No.	ITU-T SG	Meeting Date
1	FG-AI4H	03-05 July 2023
2	FG on metaverse	04-06 July 2023
3	ITU-T SG16	10-21 July 2023

S. N.	ITU-T SG	Meeting Date
4	SG20 RG-AP	25-26 July 2023
5	ITU-T SG17	29 Aug– 08 Sep 2023
6	ITU-T SG20	13-22 Sep 2023
7	ITU-T SG12	19-28 Sep 2023
8	ITU-R SG5	26-26 Sep 2023
9	ITU-T SG11	10-20 Oct 2023
10	ITU-T SG2	06-15 Nov 2023

For more details about ITU events [click here](#)

## NATIONAL WORKING GROUPS/ STUDY GROUPS MEETINGS/ ACTIVITIES

**NWG-2:** 4th meeting of NWG2: 20 January 2023

**NSG-5:** Meetings of NSG-5: 16 & 19 January, 2023.

**NWG-9:** 7th Meeting of NWG9: 29 March 2023

**NWG-11:** 5th meeting of NWG 11: 16 February 2023

**NWG-13:** 4th meeting of NWG 13: 08 February 2023

**NWG-15:** 4th and 5th meetings of the NWG-15 were held on 30 January 2023 and 20 March 2023 respectively, wherein the group approved three contributions for submission in SG15 meeting scheduled to be held from 17-28th April 2023.

**NWG-17:** Three meetings were held on 04 January 2023, 20 January 2023 and 07 February 2023

**NWG-20:** Meetings of NWG-20 was held on 5th January 2023 to discuss and finalize contributions for the ITU-T SG-20 meeting, Jan-Feb 2023.

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

# 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) Certificates issued:

Quarter Q2 = 209      Total = 636

### b) Status of OEM registration:

Indian OEM      09 (Total=103 till date)

Foreign OEM      09 (Total=150 till date)

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

## CAB DESIGNATION ISSUED:

### • CAB designations issued -

New = 02      Renewed = 01

### • Total Designated CABs = 62 (as on 31.03.2023)

IT Safety = 43	EMI/EMC = 31
SAR Testing = 04	Environmental = 24
O.F. Single Mode =02	O.F. Cable =01
Wi-Fi Interface =09	Radio Safety =04
GSM/ GPRS/ EDGE=06	BLE Interface=06
RFID Interface=03	LPWAN LoRA IF=04
LTE or LTE-A IF=06	WCDMA or HSPA IF=06

- One lab designated for **CAS & SMS testing** as per TRAI notification and TEC test guides.

## VOLUNTRY TESTING

Certificate issued in Q4 = 05 (2 Type Approval, 2 Interface Approval and 1 Technology Approval)

Total certificate issued till 31.03.2022 = 33 (18 Type approval, 9 Interface Approval, 1 Certificate of Approval and 5 Technology Approval)

- Technology Approval Certificate for C-DOT 4G EPC (4G Core) Software Solution has been issued by TEC on 19.01.2023
- C-DOT's STBR router (model no: CRAT-100/CRDT-100) has been successfully certified against TEC ER.

## UPDATES

- Acceptance of valid certificate issued by BIS or test reports issued by BIS recognized labs against safety requirements under MTCTE vide notification dated 03.01.2023
- Notification of testing of Wi-Fi CPE and IP Router including Security Testing (As per ITSAR, formulated by NCCS) under MTCTE notified dated 27.02.2023
- Simplification of MTCTE certification process from GCS to SCS for commonly deployed telecom and networking products namely WiFi products, PON devices, Routers, LAN Switches etc. w.e.f. 01 Jan 2023 has resulted in issuance of more than 110 certificates in three months.
- Notification of MTCTE reforms dated 23.03.2023 regarding exemption of MTCTE fee for Government R&D institutes like CDOT and revision of MTCTE Certificate Modification Fee from existing administrative fee and full evaluation fee( wherever applicable i.e. for GCS products) to administrative fee along with 20% of test report evaluation fee as per respective fee group of product.

# TESTING AND CERTIFICATION

- ER of Base Station for Cellular Networks was split in two ERs with variants up to 4G cellular technology in one ER and variants of 5G BTS in other ER for ease of doing business, clarity for the customs and MTCTE surveillance by LSA field units related to 5G products as 5G BTS is not covered in MTCTE Phase-III or IV.
- To facilitate the labs for the development/enhancement of testing capability/capacity in country for telecom sector, especially in field of 5G Products (5G Core, 5G BTS etc.), TEC has notified that: - **The Labs seeking designation in field of 5G Products (5G Core, 5G BTS etc.) are exempted from submission of payment of application fee for CAB Designation for a period of one year**
- For enhancement of the testing capabilities in the country specially in field of 5G products (5G Core, 5G BTS etc.) and some emerging technologies like Hypervisor, Hybrid Set Top Box, IP terminal etc., TEC has announced that **Provisional Designation** will be granted to Domestic Labs. This Provisional Designation will enable labs to acquire customers for testing of products and in building confidence regarding testing capabilities. However, such Provisionally Designated Labs will not be able to issue test reports to customer till successful NABL Accreditation for concerned scope and Provisional CAB designation is not regularized by TEC.
- With regard to have insight of the Accreditation Process of NABCB for Certification Bodies, Conformity Assessment (CA) CA division TEC had a meeting with CEO NABCB in NABCB office at Engineers Bhawan, New Delhi on 15.03.2023.
- In reference to signing of MoU with IITM Parvartak, a meeting was held on 22-23 March 2023 with IITM Parvartak for development of Test Schedule and Test Procedures (TSTPs), topology configuration scripts, and capacity building based on the requirements of TEC.
- In reference to India-Canada FTA, 7th round of negotiations held from 3-6 April 2023 in Ottawa, Canada, to

have discussions on TBT chapter under negotiations, DIR (IMP&TEP-I), AD (CA) attended the e-meeting held on 29-03-2023 under the chairpersonship of Director, Ministry of Commerce to discuss India's position and way forward for TBT chapter for articles related to FSSAI (article on Ice-wine), NABCB (Articles under Conformity Assessment), D/o Telecom (Article under Conformity Assessment) and D/o Civil Aviation and D/o Shipping (Articles under Conformity Assessment).

## POC/ FIELD TRIALS

1. The validation of following POC/ field Trials were carried out by the officers of '6G Tech. Division':
  - Field Trial of Quantum Key Distribution Link established by C-DOT between Sanchar Bhawan, New Delhi and NIC Office, CGO Complex, New Delhi
  - Secure VC Solution of C-DOT using Post-Quantum Cryptography established between C-DOT, TEC and DoT HQ.
2. C-DoT 4G RAN eNodeB Technology Approval testing is ongoing and 192 test cases out of 240 were completed at the end of March 2023.



3. Rapid Proof of Concept testing of three eNodeB 4G RAN products and one E-Band product testing has started at Bengaluru from the month of January 2023.



# KNOWLEDGE DISSEMINATION

## STUDY PAPERS

A White paper on **Human Exposure Requirement for EMF Exposure** in view of **ICNIRP 2020 Regulation** was issued by Radio Division, TEC.

For details [click here](#)

## TRAINING/ WORKSHOP/ WEBINAR

- Conducted a Workshop cum Demo on “**5G Broadcast Technology**” at Manak Hall, Ground Floor, TEC New Delhi. In the workshop M/s Qualcomm and M/s Rohde & Schwarz (R&S) had participated.
- A webinar on **Intelligent transport system – Technology & Standards** was organized by IoT division, TEC on 10th January 2023. It was inaugurated by Member (Services), DoT. The presentations were made by expert speakers from India and abroad, covering ITS/ C-V2X ecosystem, spectrum related aspects, security, solutions, operators’ and OEM’s perspective. The webinar highlighted the technologies and standards for Intelligent Transport System. It was well attended more than 120 participants across the globe.



- CA Division, TEC has organised an e- meeting with various LSA's units at 11:00 hrs on dated 16.03.2023 under the chairmanship of Sr. DDG, TEC in which presentation on **Non-Intrusive Surveillance (NIS) Portal** was given by C-DoT team.
- **In order to strengthen security posture of IT infrastructure in TEC:** Hardening of Router, WiFi & end-point devices like PCs, laptops in TEC are completed; Security Audit of all the divisions of TEC is completed; Unified Threat Management / Next Generation Firewall device (UTM/NGFW) installed in TEC network on 06.02.2023.
- Coordination in testing of secure VC solution between TEC and DoT being done by C-DoT.
- About 100 telecom products were evaluated on **trusted telecom portal**.
- Director (IT-1) as a member of the Tender evaluation committee did the Evaluation of Revamping of IT infrastructure at CBI HQ.



## HIGHLIGHT OF BUDGET 2023-24

### Strengthening 5G:

- Setting up 100 Labs for developing applications using 5G Services in engineering institutions to realize a new range of opportunities, business models and employment potentials.
- Applications covered such as Smart Classrooms, Precision Farming, Intelligent Transport Systems and Healthcare Applications

## OTHER IMPORTANT ACTIVITIES

- Management Review Meeting (MRM) of TEC for ISO 9001:2015 was held under the Chairmanship of Sr. DDG and Head of TEC on 12th January 2023.

# KNOWLEDGE DISSEMINATION

## IMPORTANT MEETINGS & ACTIVITIES

- Sh. Sushil Kumar, DDG (IoT) participated virtually in IEC- ISO- ITU Joint Smart City task force (J-SCTF) meeting, 27-28 March 2023 as an expert member from ITU.
- Sh. Abdul Kayum, DDG(6G) delivered the talks as key-note speaker in the COMSNETS TASIR "Testbeds for Advanced Systems Implementation and Research" Workshop on January 8, 2023 sharing the Indian 6G technology roadmap.



- DDG(6G) delivered the talks as Expert speaker in the panel discussion on "Quantum Technology- Now and Future" at Workshop on Quantum Science & Technology organized by IIT Bombay on February 17 and 18, 2023. The panel included Prof. Serge Haroche, Nobel Laureate in Physics.



- Sh. Venkata Rama Raju Chelle, Director (Quantum technologies) participated as an expert in the panel discussion at "Symposium on Quantum Computing Ecosystem: Basic building Blocks" organized by C-DAC on 30th and 31st January, 2023.

- To discuss mutual collaboration for contributions to international standards organizations, DDG (C&B/Std) attended a meeting in BIS HQ with BIS and TSDSI .
- DDG (IoT) chaired the 23rd meeting of BIS LITD 27 "Internet of Things & Related Technologies" on 3rd March 2023 for preparing contributions for upcoming ISO/IEC JTC1 SC41 meeting. This meeting was attended by several industry members including ADG (IoT) TEC.
- DDG (IoT) delivered a talk in the faculty development programme (ATAL-FDP) on IoT and 5G Technology and Use Cases in Agriculture, organized by JSS Noida, 3rd Jan 2023.
- DDG (IoT) delivered key note address on Initiatives on IoT/M2M Standardization in India and oneM2M Testing and Certification on 24th Feb 2023 in oneM2M Stakeholders day organized by TSDSI. Ms. Namrata Singh attended this event as well as the oneM2M TP.
- DDG (IoT) delivered a talk on TEC initiatives in IoT domain in BIS-TEC-TSDSI Joint workshop organized by BIS, 21st Feb 2023.
- **Karmayogi** team of DOT HQ and NTIPRIT held training session at TEC on 8 Feb 2023 to finalize the FRACing exercise for TEC. Officers of different sections of TEC participated in the training.



# HR ACTIVITIES

## TEC WELCOMES ON NEW JOINING 🌸 🙏

- Ms. Shubha Bhambhani, DDG (RC)
- Sh. Sujit Kumar Director (6G Technologies)
- Sh. Rajesh Tripathi Director (NGN)
- Sh. Bhavesh Anil Sharma Director (Fi)

## CONGRATULATIONS ON PROMOTION 🌸

### STS TO JAG

- Sh. Avadhesh Singh, Director (TC)
- Ms. Ranajana Sivaram, Director (MT)
- Ms. Divya Sharma, Director (TC)
- Ms. Neha Upadhyaya, Director (Radio)
- Ms. Preetika Singh, Director (TS)
- Sh. Harsh Sharma, Director (C&B)

### TES GROUP 'B' TO JTS GROUP A LEVEL

- Ms. Jyoti Sengar, ADET(TS)

## TEC BIDS FAREWELL ON TRANSFER 🌸

- Sh. Krishan Lal Chabra, DDG (Tx)
- Akhilesh Kumar Gupta, DDG
- Ms. Neeti Singh, Dir (NR)
- Sh. Dinesh Sharma, Dir (Admin)
- Ms. Ratna Thakur, Dir (Tx)
- Sh. V P Ajansondkar, ADG (IMP&TEP)
- Sh. Pankaj Kumar, ADG (HK)
- Sh. Aftab Alam, ADG( C&B)

## HAPPY RETIREMENTS 🌸 🙏

TEC bids farewell on superannuation from services to the following officers -

- Sh. Anoop Kumar, DDG (Admin)

## INTERNATIONAL WOMEN'S DAY 2023



**International Women's Day 2023: "DigitALL: Innovation and technology for gender equality"** was celebrated in Telecommunication Engineering Centre (TEC) on 13 March 2023. Session on Digital divide and secure cyber practices was organized for all women Officials/ staff of TEC.

## हिन्दी गतिविधिया

**हिंदी कार्यशाला:** दूरसंचार अभियांत्रिकी केंद्र में दिनांक 23.03.2023 को एक हिंदी कार्यशाला का आयोजन किया गया। इस कार्यशाला के अतिथि वक्ता श्री केवल कृष्ण, सेवानिवृत्त वरिष्ठ तकनीकी निदेशक (राजभाषा विभाग) द्वारा कंप्यूटर पर हिंदी में कार्य करने हेतु राजभाषा अधिनियम 1963 यथा संशोधित 1967, राजभाषा नियम 1976 यथा संशोधित 1987, राजभाषा संकल्प 1968, गूगल वॉइस टाइपिंग, कंठस्थ-2.0 टूल, उड़ान मशीन ट्रांसलेशन सिस्टम आदि के बारे में विस्तार से बताया गया।

**राजभाषा कार्यान्वयन समिति की तिमाही बैठक :** दिनांक 27-02-2023 को राजभाषा कार्यान्वयन समिति की तिमाही बैठक का आयोजन किया गया एवं कार्यवृत्त जारी किया गया।

# UPDATES

## ITU AREA OFFICE & INNOVATION CENTRE



Hon'ble Prime Minister, Shri Narendra Modi inaugurated the new **International Telecommunication Union (ITU) Area office & Innovation Centre** in India at a programme in Vigyan Bhawan on 22 March, 2023. The Prime Minister also unveiled the **Bharat 6G Vision** Document and launched the **6G R&D Test Bed**. He also launched the 'Call before u Dig' App.

Ms Doreen-Bogdan Martin, Secretary General of the International Telecommunication Union thanked the Prime Minister for helping develop the new ITU Office and innovation center in India which marks a new chapter in the long history of India and ITU. She expressed confidence that ITU's presence in the region will help the introduction of advanced technologies, improve capacity development, and foster entrepreneurship and partnerships while also responding to leads on the ground from digital services, skills, cyber security and digital inclusion.

## COMMUNICATION MINISTERS' CONCLAVE:

A Communication Ministers' Conclave was held in New Delhi, with the theme of 'Enabling Innovation in Telecommunications to Ensure Digital Transformation of the Society'. During the conclave, Hon'ble MoC Shri Ashwini Vaishnaw and Ms Doreen Bogdan-Martin, Secretary General, ITU unveiled Coffee Table Book 'ITU@India' as well as

launched the UN Wayfinder navigational mobile App. The App has been developed by C-DOT, to enable users to find their way in various blocks and floors of UN buildings in Geneva.



## CHINTAN SHIVIR

A one day Chintan Shivir was organised on March 18 by the Department of Telecom at Vigyan Bhawan under the guidance of Hon'ble MoC to brainstorm on the most critical topics relevant to the telecom sector to chalk out the strategy & way forward to achieve short and long term goals.



## 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 finalised 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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