



सत्यमेव जयते

NTIPRIT

Policy and Supervision system for C&I in India

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Agenda

1. Policy and Supervision Systems in India for development of Telecom
2. Conformity and Interoperability Regimes of Telecommunication equipment in India

Part -1

Policy & Supervision

Role of Government

- Telecom infrastructure is treated as a crucial factor to realize the socio-economic objectives in India.
- Accordingly, the Department of Telecom under Ministry of Communications has been formulating developmental policies for the accelerated growth of the telecommunication services.
- The vision of Department of Telecom is to provide secure, reliable affordable and high quality converged telecommunication services anytime, anywhere for an accelerated inclusive socio-economic development.

Telecom Ecosystem in India - Government

Policy &
Licensing

Regulation

Dispute
Resolution

Standardization

Conformance,
Testing &
Certification

Research &
Development

Universal
Service Access

International
Cooperation

Supervision

Telecom Ecosystem in India – Public sector

Telecom Service
Provision

Telecom
Manufacturing

Nationwide
Optical fibre
Network

Consultancy &
Project
Execution

Telecom Ecosystem in India – Private sector

Telecom
Service
Providers

Value Added
Service
Providers

Equipment
Manufacturers

Infra Providers
(Telecom Tower
Companies)

Policy & Licensing

Department of Telecom looks after :

- **Policy, Licensing and Coordination** matters relating to telecommunications.
- **International cooperation** in matters connected with telecommunications including matters relating to all international bodies dealing with telecommunications **including frequency management**
- Promotion of **standardization**, research and development in telecommunications.
- Promotion of private **investment** in Telecommunications.
- Financial assistance for the furtherance of **research** and study in telecommunications technology and for **capacity building** in the sector.

Regulation

Telecom regulatory Authority of India (TRAI)

- The entry of private service providers necessitated the need for an independent regulator to provide a fair and transparent policy environment which promotes a level playing field and facilitates fair competition.
- The Telecom Regulatory Authority of India (TRAI) was, established in 1997 by an Act of Parliament, to regulate telecom services, including tariff, interconnection and quality of service.
- TRAI's mission is to create and nurture conditions for growth of telecommunications in the country in a manner and at a pace which will enable India to play a leading role in emerging global information society.
- TRAI has provided the required direction to the evolution of Indian telecom market from a Government owned monopoly to a multi operator multi service open competitive market.

Dispute resolution

Telecom Dispute Settlement and Arbitration Tribunal (TDSAT)

- The TRAI Act was amended by an ordinance, effective from January 2000, establishing a Telecommunications Dispute Settlement and Appellate Tribunal (TDSAT) to take over the adjudicatory and disputes functions from TRAI.
- TDSAT was set up to adjudicate any dispute
 - between a licensor and a licensee,
 - between two or more service providers,
 - between a service provider and a group of consumers, and
 - to hear and dispose of appeals against any direction, decision or order of TRAI.

Research & Development

Centre for Development of Telematics (C-DoT)

- C-DOT is the Telecom Technology development centre of the Government of India. It was established in August 1984 as an autonomous body.
- C-DOT revolutionized rural telecommunication in India through its telecom switching products ideally suited to Indian conditions in the form of small Rural Automatic Exchanges (RAXs) and medium size switches as SBMs for towns followed by higher capacity digital switches known as Main Automatic Exchanges (MAXs).
- Beginning the journey with digital switching systems, C-DOT has traversed the complex Telecom landscape, developing products in the area of optical, satellite and wireless communication.
- The R&D centre is working on several important, cutting edge technologies and projects of National importance, such as Central Monitoring Systems for Telecom Security.

Universal Service

Universal Service Obligation Fund (USOF)

- Universal service obligation means the obligation to provide access to basic telecom services to people in the rural and remote areas at affordable and reasonable prices.
- The licensees will contribute a certain percentage of their revenues/profits to this fund and the same shall be utilised in providing the subsidies for creation of rural telecom infrastructure and services.
- Some of the major interventions of USO Fund have been :
 - Telecom Tower infrastructure in rural / inaccessible areas
 - National optical fiber network (NOFN)

Standardisation

For Creation of National Standards and Harmonisation of International Standards :

- Bureau of Indian Standards (BIS)
 - All products, except Telecom
- Telecom Engineering Centre (TEC)
 - All Telecom products
 - Telecom arm of DoT, and represents Government of India in international telecom bodies

Testing & Certification

Telecom Engineering Centre (TEC)

- Responsible for C & I Activities
- Tests and Certifies telecom equipment, interfaces, networks

Supervision / Monitoring

Telecom Enforcement and Resource Monitoring (TERM)

With the increasing number of telecom operators in the country, the Government felt the need for presence of Telegraph Authority in the in order to ensure that service providers adhere to the licence conditions and for taking care of telecom network security issues.

Security Functions

- Matters related to national security.
- Technical interface between Security Agencies and Telecom Service Providers
- *Service Testing of various Licensed Service Providers in the Licence area and checking roll-out obligation as per license condition.*
- *Checking of compliance to Electro Magnetic Field (EMF) radiation norms.*

Supervision / Monitoring

Vigilance Functions

- Curbing illegal activities in telecom services
- Control over clandestine telecom networks
- Technical arrangement for the lawful interception / monitoring of all communications passing through the licensees network.
- To ascertain that the licensee is providing the services within permitted area.

Monitoring Functions

- Monitoring of network parameters.
- Checking of the compliance by the licensee in respect of the license conditions
- To ensure optimum call completion ratio of inter operator calls.
- Disaster Management: Taking over of network in the events of natural calamities or the other emergency situations.
- Grievance redressal of subscribers in respect of deficiency by various operators.
- Customer Document Verification with the objective to ascertain whether the mobile service operators are following the DoT guidelines for Customer verification before providing connections

Telecom Ecosystem in India – Public Sector

- Govt. owned / Public Sector Telecom Service Providers
 - Bharat Sanchar Nigam Limited (BSNL)
 - Mahanagar Telephone Nigam Limited (MTNL)

- Providing Countrywide Broadband access (Bharat Net) through National Optical Fiber Network
 - Bharat Broadband Nigam Limited (BBNL)

- Telecom Consultancy & Project Execution
 - Telecom Consultants of India Limited (TCIL)

- Telecom manufacturing
 - Indian Telephone Industries (ITI)
 - Telecom Factories

Telecom Ecosystem in India – Private Sector

- Telecom Service Providers.
 - Major TSP's are
 - Airtel
 - Vodafone
 - Idea
 - Reliance / JIO

- Internet Service Providers

- Passive infra Providers / Telecom Tower Companies

- Value Added Services Providers

Part -II
Conformity & Interoperability Regime

Institutions responsible for C&I activities

- In India, Telecom Engineering Center (TEC) under Ministry of Communications, is the institution responsible for C&I activities.
- The functions of TEC are
 - Formulate technical requirements for all telecom equipment and networks, to ensure seamless functioning and inter-operability in Indian telecom network
 - Formulate standards to limit harmful electromagnetic interference to ensure proper functioning of equipment, as well as to ensure safety for human beings
 - Test and certify equipment, interfaces, and networks
 - Monitor, for compliance to the laid-down norms and standards on need basis

Legal Framework of the C&I Regime for Telecommunication /ICT equipment in the country

Under the Indian Telegraph Rules, 1951, PART XI : Testing & Certification of Telegraph, an Original Equipment Manufacturer (OEM)/ importer/ dealer who wishes to sell, import, let for hire, or possess any telecom equipment, shall first obtain Interface Approval / Compliance Certificate from Telecom Engineering Centre (TEC) and mark or affix the equipment with appropriate Interface Approval / Compliance label, among others for the following:

- To ensure that any telecom equipment does not degrade performance of existing network when connected.
- To ensure safety of the end-users.
- To protect users and general public from harmful radio frequency emissions.
- To ensure that telecom equipment complies with the relevant national and international regulatory standards and requirements.
- To ensure security of the state.

Legal Framework of the C&I Regime for Telecommunication/ICT equipment in the country

While granting licenses, Government has mandated certain conditions that the licensee (Telecom Service Provider) has to abide. Some excerpts :

- For providing the Service the Licensee shall utilize any type of equipment and product that meet TEC standards, wherever made mandatory by the Licensor from time to time.
- In the absence of mandatory TEC standard, the Licensee may utilize only those equipment and products which meet the relevant standards set by International standardization bodies, such as, ITU, ETSI, IEEE, ISO, IEC etc., or set by International Fora, such as 3GPP, 3GPP-2, IETF, MEF, WiMAX, Wi-Fi, IPTV, IPv6, etc. as recognized by TEC and subject to modifications/adaptation, if any, as may be prescribed by TEC from time to time.
- Transmission links for interconnection shall meet relevant standards or Interface Requirements (IR) issued by TEC from time to time.

License Conditions

Some excerpts of license conditions :

- Norms on Electromagnetic Field exposure by BTS (Base Stations)
 - the Licensee shall conduct audit and provide self certificate, at prescribed interval and as per procedure prescribed by Telecommunication Engineering Centre (TEC) / or any other agency authorized by Licensor from time to time for conforming to limits / levels for antenna (Base Station Radiation Emissions)
- In case of Satellite based services, the technical parameters & data rates mentioned in Interface Requirements for Satellite Communications namely No. TEC-IR/SCB-08/02-SEP.2009 issued by TEC are to be strictly complied with. Any notification or modification issued by TEC from time to time in this regard shall be binding.
- Failure on the part of Licensee to adhere to the network to network interface standards of TEC is liable to be treated as breach of LICENSE terms and conditions.

Common problems faced due to the lack of conformity and interoperability, in India

- Interface approval alone cannot be construed as a guarantee of the proper functioning, performance, or quality of the equipment.
- With No checks for conformance to standards and No mandatory certification before induction in telecom network; Products may not conform to all the desired specifications, May not interwork properly, May cause harm to other equipment or user.
- Secondly there have been concerns related to Telecom Networks compromising national security in absence of indigenous security certifications.
 - Telecom Commission has recognised the need for All telecom equipment to be tested and certified before induction in Indian telecom network and that **mandatory testing** and certification shall be got done only from authorised and certified agencies or labs in India w.r.t. user and network security and integrity.
 - However Changes in Telegraph Rules and Licenses may be required to implement this.

TEC Functions

- Specifications
 - Generic Requirements (GR)
 - Interface Requirements (IR)
 - Service Requirements (SR)

- Testing & Certification against GRs, IRs and Manufacturer's Specifications

Definitions

GENERIC REQUIREMENT (GR)

Generic Requirement of a telecom equipment issued by TEC implies a set of requirements **pertaining to performance, features, quality etc.** besides Interface Requirement (IR) of the equipment.

INTERFACE REQUIREMENT (IR)

Interface Requirement of telecom equipment implies a minimum set of requirements issued by TEC **primarily in respect of inter-operability, safety and security** that the equipment should conform to in order to connect and operate in the Indian Telecom Network.

SERVICE REQUIREMENT (SR)

Service Requirements (SR) **detail the services and network related requirements** for specific applications, which should be met by service providers in accordance with the requirements **specified by licensing authority**

Generic Requirements (GR)

- Generic Requirements are classified in two parts – minimum “mandatory” requirements and “desirable” requirements.

- These requirements refer to the following
 - Interconnectivity and interoperability requirements
 - Quality requirements
 - EMI/EMC requirements
 - Safety requirements
 - Security requirements
 - Any other equipment specific requirements that are considered mandatory
 - Desirable requirements, if any

Interface Requirement (IR):

- Interface Requirements ensure that:
 - The operating network (DOT or any other public network) or the persons using/ installing or maintaining the particular equipment are not harmed in any way. (Safety Standard)
 - During operation of the equipment there is no interference to other or by other equipment. (EMI/EMC Standards)
 - The product / network smoothly works with the existing network i.e. provides the minimum mandatory protocols, signals, responses and features for its proper working.
 - The minimum mandatory Standards' for electrical interconnect/ compatibility are met by the equipment.
 - Any inadmissible features that could affect the network interworking/ compatibility and service are precluded.
 - Equipment is not designed to evade, surreptitiously, regulations concerning the use of telecom service. In particular it should not allow the users to circumvent the tariff structure of DOT or any other service provider or to manipulate its telecom equipment.

SERVICE REQUIREMENT (SR)

Service Requirements ensure that:

- The service itself or any option available in the service should not have any inadmissible features which may be detrimental to the National Telecom Network.
- The service feature does not lead to the use of telecom services surreptitiously. In particular it should not allow the user to circumvent the tariff structure of the National Telecom network or to manipulate its telecom service.
- It should have facility to isolate the national Telecom Network lines/ network for the purpose of testing and provide adequate response for test purposes.
- The service confirms to the prevailing laws of Govt. of India.

TEC Tests and Certifies telecom products for

1. Connectivity

- Interface Approval

2. Equipment

- Type Approval
- Certificate of Approval

Conformity assessment processes in place

TYPE APPROVAL

Type Approval is a process of testing and certification of telecom product, in accordance with Test Schedule & Test Procedure (TSTP) of TEC, for conformance with the Generic Requirement (GR) of the product issued by TEC.

INTERFACE APPROVAL

Interface Approval is a process of testing and certification of telecom equipment, in accordance with Test Schedule & Test Procedure (TSTP) issued by TEC, for conformance with the Interface Requirement (IR).

CERTIFICATE OF APPROVAL

Certificate of approval is issued by TEC for the product for which the IR/GR does not exist with TEC and is issued against applicant's own specification.

Testing & Certification activities

1

- Scrutiny of application

2

- Registration of case

3

- Evaluation of product

4

- Issue of approval

Documents to be submitted

1. Forwarding letter.
2. Form A (Duly signed by authorized signatory)
3. Para wise Compliance Report as per TEC "IR" & Test Results as per Test Schedule.
4. Industrial License/SSI Registration /Certificate of Incorporation / RBI Permission to open Branch Office, FIPB clearance as applicable etc.
5. Foreign collaboration copy (if applicable)
6. System specifications containing features and facilities.
7. User's Operating Manual.
8. Complete supporting technical document for the product. The technical documents include installation document, operation manual, and maintenance manual.
9. Old Certificate copy (for Renewal case/Change of Name or Address) and an undertaking for no Hardware & Software changes (For Renewal case).
10. An Affidavit, attested by Notary Public for each product/model.
11. Infrastructure Assessment Form for the product offered by the Manufacturer for the first time & Infrastructure Assessment shall be carried out for only Indian Manufacturers only. In case of trader/Branch Office declaration that he has Test and Repair facility for the product.
12. In case of traders, authorization letter from the manufacturer appointing him as trader for the product indicating the period of validity if fixed or open ended. MOU also required to be submitted if available .
13. EMI/EMC test results and test certificates from authorized accredited lab as per TEC IR, if applicable.
14. Availability of Test Instruments and calibration certificates of those instruments need to be submitted to TEC.
15. Each Page of the documents to be submitted should be stamped and signed by the authorized signatory.

Service Standards of TEC

S.No.	Services/Transactions	Weight	Success Indicators	Service Standard	Unit	Weight	Data Source
1	Issue of Type Approval		Time to conduct testing and preparation of report	30	Days		Records
			Time for review, approval and issue of certificate	15	Days		Records of testing
2	Issue of Interface Approval		Time to conduct testing and preparation of report	30	Days		Records
			Time for review, approval and issue of certificate	15	Days		Records of testing
3	Issue of Certificate of Approval		Time to conduct testing and preparation of report	30	Days		Records
			Time for review, approval and issue of certificate	15	Days		Records of testing

Terms

- CAB
- CB
- MRA

Conformity Assessment Framework

CONFORMITY ASSESSMENT BODY (CAB)

Conformity Assessment Body is a body that conducts conformity assessment activities concerned with determining whether products, manufacturers or processes meet relevant standards and specifications.

CERTIFICATION BODY (CB)

Certification Body is a body that issues conformance certificate and may also conduct conformance assessment activities.

Conformity assessment processes : MRA

- TEC would recognize, as per International best practices, other test labs in India and abroad for the purpose of speedy and efficient testing and certification process. (MRA)

- Under the MRA, the Govt. of India , has declared its Telecommunication Engineering Centre (TEC) as the Designating Authority (DA).
 - TEC as DA will designate Conformity Assessment Bodies (CABs) & Certification Bodies (CBs) located in India to perform testing and certification of telecom products

 - TEC as DA will also recognise Foreign CABs & CBs located in the territory of MRA partner to perform testing and certification of telecom products to India's requirements.

Accreditation

- A test laboratory will be at first accredited and then designated as CAB or CB to carry out testing and certification with respect to one or more of the applicable DoT's Technical Regulations/ technical specifications / standards for telephony and/ or radio communication equipment.
- CABs shall be accredited by NABL (National Accreditation Board for Testing & Calibration Laboratories) in accordance with ISO/IEC 17025:2005 and
- CBs shall be accredited by NABCB (National Accreditation Board for Certification Bodies) in accordance with ISO/IEC guide 65:1996. This standard has been revised by ISO/IEC 17065:2012

Future Vision

- Regional collaboration :
 - Govt of India and Republic of Singapore have entered into Comprehensive Economic Cooperation Agreement (CECA), as per which both the countries have agreed on “Mutual Recognition Agreement”(MRA) in Telecom Sector.
- Attempts are being made to broad base the MRAs by having MRAs with other countries
- Test labs for SAR, LTE, IPv6 have been set up
- Work is in process for setting up a Telecom Testing and Security Certification Centre (TTSC), to enable Telecom Service Providers get their equipments tested. Standards, test procedures and test tools for the same are being developed in a pilot lab.

Thank You