Indian Standardizations Landscape

Priority Sectors – Digitization and Green & Clean technologies

(July 2023)

SESEI | Seconded European Standardisation Expert in India

Enabling Europe-India Cooperation on Standards

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1. Acronyms

S. No.	Acronym	Expansion
1	**3GPP**	3rd Generation Partnership Project
2	**A2LA**	American Association for Laboratory Accreditation
3	**ACMA**	Automotive Component Manufacturers Association of India
4	**AI**	Artificial Intelligence
5	**AISC**	Automotive Industry Standards Committee
6	**AITS**	Association for Intelligent Transport Systems
7	**AMP**	Automotive Mission Plan
8	**ANSI**	American National Standards Institute
9	**APLAC**	Asia Pacific Laboratory Accreditation Co-operation
10	**APT**	Asia Pacific Telecommunication
11	**ARAI**	Automotive Research Association of India
12	**ARIB**	Association of Radio Industries and Businesses
13	**ASSOCHAM**	Associated Chambers of Commerce and Industry of India
14	**ASTM**	American Society for Testing and Materials
15	**ATMA**	Automotive Tyre Manufacturers' Association
16	**BEE**	Bureau of Energy Efficiency
17	**BIS**	Bureau of Indian Standards
18	**BOs**	Branch Offices
19	**BSI**	BSI Group India Pvt. Ltd.
20	**BU**	billion unit
21	**CAB**	Conformity Assessment Bodies
22	**CAF**	Conformity Assessment Framework
23	**CAREL**	Core Advisory Group for Research and Development (R&D) in Electronics Hardware
24	**CASCO**	Committee on Conformity Assessment
25	**CBIP**	Central Board of Irrigation & Power
26	**CCA**	Controller of Certifying Authorities
27	**CCPA**	Central Consumer Protection Authority
28	**CCS**	Combined Charging System
29	**C-DAC**	Centre for Development of Advanced Computing
30	**C-DOT**	Centre for Development of Telematics
31	**CDR**	Conjugate data repetition
32	**CEA**	Central Electricity Authority
33	**CEAMA**	Consumer Electronics and Appliances Manufacturers Association
34	**CEDC**	Civil Engineering Division Council

35	**CETEs**	Centre for Electronics Test Engineering
36	**CeWIT**	Center of Excellence in Wireless and Information Technology
37	**CGPDTM**	Controller General of Patents, Designs & Trade Marks
38	**CHAdeMO**	CHArge de Move
39	**CHDC**	Chemical Division Council
40	**CII**	Confederation of Indian Industries
41	**CIPET**	Central Institute of Plastics Engineering and Technology
42	**CIRT**	Central Institute of Road Transport
43	**C-MET**	Centre for Materials for Electronics Technology
44	**CMVR - TSC**	Central Motor Vehicles Rules -Technical Standing Committee
45	**CNITSEC**	China Information Technology Certification Centre
46	**COAI**	Cellular Operators Association of India
47	**CoFIP**	Collision free Interlaced pilots
48	**CPCB**	Central Pollution Control Board
49	**CPRI**	Central Power Research Institute
50	**CPSE**	Central Public Sector Enterprise
51	**CRS**	Compulsory Registration Scheme
52	**CSIR**	The Council of Scientific and Industrial Research
53	**CSS**	Centrally Sponsored Scheme
54	**DDG**	Decentralised Distribution-Cum-Generation
55	**DHI**	Department of Heavy Industry
56	**DIPP**	Department of Industrial Policy & Promotion
57	**DMIC**	Delhi - Mumbai Industrial Corridor
58	**DMICDC**	Delhi - Mumbai Industrial Corridor Development Corporation Limited
59	**DoT**	Department of Telecommunications
60	**DQS**	Delhi Quality Services
61	**DRDO**	Defence Research and Development Organisation
62	**DSCI**	Data Security Council of India
63	**DST**	Department of Science & Technology
64	**EBGI**	European Business Group India
65	**EESL**	Energy Efficiency Services Limited
66	**EIAs**	Export Inspection Agencies
67	**EIC**	Export Inspection Council
68	**ELCINA**	Electronic Industries Association of India
69	**EMS**	Environmental Management Systems
70	**EPC**	Export Promotion Councils of India
71	**ER&DCI**	Electronic Research and Development Centre of India
72	**ERDA**	Electrical Research and Development Association
73	**ERTLs**	Electronics Regional Test Laboratories

74	**ESC**	Electronics Export and Computer Software Promotion Council
75	**ESDM**	Electronic System Design & Manufacturing
76	**ETDC**	Electrotechnical Division Council
77	**ETDCs**	Electronics Test and. Development Centres
78	**ETSI**	European Telecommunications Standards Institute
79	**EV**	Electric Vehicle
80	**FADC**	Food and Agricultural Division Council
81	**FAME**	Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles
82	**FDI**	Foreign Direct Investment
83	**FICCI**	The Federation of Indian Chambers of Commerce and Industry
84	**FIEO**	Federation of Indian Export Organizations
85	**FMCS**	Foreign Manufacturers Certification Scheme
86	**FRAND**	Fair, Reasonable and Non-Discriminatory
87	**GARC**	Global Automotive Research Center
88	**GC**	Governing Council
89	**GDG**	Green Discussion Group
90	**GDP**	Gross Domestic Product
91	**GISFI**	Global ICT Standardization Forum for India
92	**GIST group**	Graphics and Intelligence based Script Technology
93	**G-PON**	Gigabit Optical Passive Network
94	**GRB (India)**	ARAI Working Party on Noise
95	**GRE (India)**	ARAI Working Party on Lighting and Light-Signaling
96	**GRPE (India)**	ARAI Working Party on Pollution and Energy
97	**GRRF (India)**	ARAI Working Party on Brakes and Running Gear
98	**GRs**	Generic Requirements
99	**GRSG (India)**	ARAI Working Party on General Safety Provisions
100	**GRSP (India)**	ARAI Working Party on Passive Safety
101	**GSC**	Global Standards Collaboration
102	**GSM**	Global System for Mobile
103	**HAPS**	High Altitude Platform Station
104	**IAF**	International Accreditation Forum
105	**IBSA**	India-Brazil-South Africa
106	**IC3S**	Indian Common Criteria Certification Scheme
107	**ICA**	Indian Cellular Association
108	**iCAT**	International Center for Automotive Technology
109	**ICC**	International Code Council
110	**ICIMOD**	International Centre for Integrated Mountain Development
111	**ICT**	Information and Communications Technology

112	**IEC**	International Electrotechnical Commission
113	**IEEE**	Institute of Electrical and Electronics Engineers
114	**IEEMA**	Indian Electrical & Electronics Manufacturers' Association
115	**IEGC**	Indian Electricity Grid Code
116	**IIP**	Indian Institute of Petroleum
117	**IIQM**	Indian Institute of Quality Management
118	**IISc**	Indian Institute of Science
119	**IMTMA**	Indian Machine Tool Manufacturers' Association
120	**INFCO**	Committee on Information
121	**INMARSAT**	International Mobile Satellite Organization
122	**INSS**	Indian National Strategy for Standardization
123	**INTELSAT**	International Telecommunication Satellite Organization
124	**IoT**	Internet of Things
125	**IP**	Intellectual Property
126	**IPR**	Intellectual Property Rights
127	**IRC**	Indian Roads Congress
128	**IRs**	Interface Requirements
129	**ISGF**	India Smart Grid Forum
130	**ISGTF**	India Smart Grid Task Force
131	**ISI**	Indian Standards Institute
132	**ISMS**	Information Security Management System
133	**ISO**	International Organization for Standardization
134	**ISRO**	Indian Space Research Organisation
135	**IT&E**	Information Technologies and Electronics
136	**ITA 2000**	Information Technology Act 2000
137	**IT-ITeS**	Information Technology - Information Technology Enabled Services
138	**ITS**	Intelligent Transportation Systems
139	**ITSM**	IT Service Management
140	**ITTAC**	Indian Tyre Technical Advisory Committee
141	**ITU**	International Telecommunication Union
142	**KYC**	Know Your Customer
143	**LITDC**	Electronics and Information Technology Division Council
144	**LTE**	long-term evolution
145	**M2M**	Machine To Machine
146	**MAIT**	Manufacturers' Association for Information Technology
147	**MAXs**	Main Automatic Exchanges
148	**MCIT**	Ministry of Communications & Information Technology
149	**MDA**	Market Development Assistance
150	**MEDC**	Mechanical Engineering Division Council
151	**MeitY**	Ministry of Electronics & Information Technology

152	**MHDC**	Medical Equipment and Hospital Planning Division Council
153	**MLA**	Multilateral Recognition Arrangement
154	**MNES**	Ministry of Non-Conventional Energy Sources
155	**MNRE**	Ministry of New and Renewable Energy
156	**MoCA**	Ministry of Consumer Affairs
157	**MoEF**	Ministry of Environment & Forests
158	**MoHI&PE**	Ministry of Heavy Industries & Public Enterprises
159	**MoP**	Ministry of Power
160	**MoRT&H**	Ministry of Road Transport & Highways
161	**MoU**	Memorandum of Understanding
162	**MoUD**	Ministry of Urban Development
163	**MRA**	Mutual Recognition Agreement
164	**MSDC**	Management and Systems Division Council
165	**M-SIPS**	Modified Special Incentive Package scheme
166	**MSME**	Ministry of Micro, Small & Medium Enterprises
167	**MTDC**	Metallurgical Engineering Division Council
168	**NABCB**	National Accreditation Board for Certification Bodies
169	**NABET**	National Accreditation Board for Education and Training
170	**NABH**	National Accreditation Board for Hospitals and Healthcare Providers “
171	**NABL**	National Accreditation Board for Testing and Calibration Laboratories
172	**NAMP**	National Air Monitoring Programme
173	**NASSCOM**	National Association of Software and Services Companies
174	**NATRAX**	National Automotive Test Tracks : Indore, Madhya Pradesh
175	**NATRIP**	National Automotive Testing and R&D Infrastructure Project
176	**NATRIP**	The National Automotive Testing and R&D Infrastructure Project
177	**NCST**	National Centre for Software Technology
178	**NCVRS**	National Center For Vehicle Research & Safety
179	**NDCP**	National Digital Communications Policy
180	**NeGP**	National e-Governance Plan
181	**NEMMP**	National Electric Mobility Mission Plan
182	**NFV**	Network Function Virtualization
183	**NGN**	Next Generation Network
184	**NIAIMT**	National Institute for Automotive Inspection, Maintenance & Training
185	**NIC**	National Informatics Centre

186	**NIIPM**	National Institute of Intellectual Property Management
187	**NIMZs**	National Investment & Manufacturing Zones
188	**NInC**	National Innovation Council
189	**NIP**	New Item Proposal
190	**NIUA**	National Institute Of Urban Affairs
191	**NMCC**	National Manufacturing Competitiveness Council
192	**NMP**	National Manufacturing Policy
193	**NNI**	Network-Network Interfaces
194	**NPE**	National Policy on Electronics
195	**NRP**	National Rail Plan
196	**NSGM**	National Smart Grid Mission
197	**NT**	Network
198	**NTP**	National Telecom Policy
199	**PASC**	Pacific Asia Standards Congress
200	**PCDC**	Petroleum, Coal and related Products Division Council
201	**PCS**	Public Charging Stations
202	**PDPB**	Personal Data Protection Bill
203	**PGEDC**	Production and General Engineering Division Council
204	**PIII**	Public Information Infrastructure and Innovations
205	**PIS**	Patent Information System
206	**PLI**	Production Linked Incentives
207	**PMA**	Preferential Market Access Policy
208	**PMI**	Project Management Institute
209	**PMUs**	Phasor Measurement Units
210	**PPP**	Public Private Partnership
211	**PRSG**	Project Review and Steering Groups
212	**PSI**	Product Specific Information
213	**PSUs**	Public Sector Undertakings
214	**QCI**	Quality Council of India
215	**QMS**	Quality Management System
216	**QoS**	Quality of Service
217	**R&D**	Research and Development
218	**RBI**	Reserve Bank of India
219	**RC**	Regional Coordination
220	**RDSO**	Research Design and Standards Organisation
221	**REMCO**	Committee on Reference Materials
222	**RET**	Renewable Energy Technology
223	**RNES**	Radio Network Evolution and Spectrum
224	**ROs**	Regional Offices
225	**RvA**	Raad vor Accreditate (Dutch Council for Accreditation)
226	**SAARC**	South Asian Association for Regional Co-operation
227	**SACC**	Scientific Advisory Committee of the Cabinet

228	**SACEP**	South Asia Co-operative Environment Programme
229	**SARSO**	South Asian Regional Standards Association
230	**SASA**	Services, Applications, Systems and Architectures
231	**SCL**	Semiconductor Complex Limited
232	**SDN**	Software Defined Networking
233	**SDO**	Standard Development Organization
234	**SDO**	Standards development organization
235	**SDoC**	Self-Declaration-of Conformity
236	**SEPs**	Standards Essential Patents
237	**SERB**	Science and Engineering Research Board
238	**SERC**	State Electricity Regulatory Commissions
239	**SESEI**	Seconded European Standardization Expert in India
240	**SG**	Study Groups
241	**SIAM**	Society of Indian Automobile Manufacturers
242	**SIG**	Special Interest Group
243	**SMEs**	small and medium enterprises
244	**SMNP**	Smart Meter National Programme
245	**SNAP**	Standards National Action Plan
246	**SR**	Service Requirements
247	**SSC**	Sector Skill Council
248	**STQC**	Standardization Testing and Quality Certification
249	**TCL**	Telecommunications Consultants (India) Limited
250	**TCOE**	Telecom Centres of Excellence
251	**TCs**	Technical Committees
252	**TDB**	Technology development Board
253	**TDSAT**	Telecommunications Dispute Settlement and Appellate Tribunal
254	**TEC**	Telecom Engineering Centre
255	**TEDC**	Transport Engineering Division Council
256	**TEMA**	Telecom Equipment Manufacturers Association of India
257	**TEPC**	Telecom Equipment and Services Export Promotion Council
258	**TRAI**	Telecom Regulatory Authority of India
259	**TSDSI**	Telecommunication Standards Development Society for India
260	**TSPs**	Telecom Service Providers
261	**TSs**	Technical Standards
262	**TSTP**	Test Schedule & Test Procedures
263	**TXDC**	Textile Division Council
264	**UIDAI**	Unique Identification Authority of India
265	**UNCED**	United Nations Conference on Environment and Development

266	**UNEP**	United Nations Environment Programme
267	**UNI**	User-Network Interfaces
268	**UNICEF**	United Nations International Children's Emergency Fund
269	**VRDE**	Vehicle Research and Development Establishment
270	**WG**	Working Groups
271	**WRDC**	Water Resources Division Council
272	**WTO/TBT**	World Trade Organization - Technical Barriers to Trade

2. Context

Acknowledging the importance of Standards and the crucial role they play in trade, research, and innovation, European standard development organizations i.e., CEN, CENELEC and ETSI along with European Commission (DG GROW) and EFTA established Seconded European Standardisation Expert in India Phase V (SESEI-V), a project focused mainly on "Standards & Public Policy".

Like its previous phases, the primary purpose of the Project is to enhance the visibility of European standardization activities, harmonisation to International Standards, increase the cooperation between Indian and European standardization bodies and provides necessary guidance and support on market access related topics. The project also supports India in standardization related aspects of its integration in the WTO trading system, by identifying all potential opportunities for enhanced international cooperation and global harmonization of standards.

The project SESEI has the ambition to facilitate EU-India cooperation in standardization matters, as well as to support Regulatory Dialogue activities involving the European Commission and the Indian Government, in support of an increase of trade flows.

Cooperation around Standardization and its harmonisation to International Standards and promoting existing international standards fares high on the agenda for both India and EU/EFTA.

The focus on trade, future technologies, standards, and sustainable development has clearly been brought out by the "EU-India Strategic Partnership: A Roadmap to 2025", endorsed by India and the EU, in July 2020. The cooperation agreements endorsed through the "Roadmap to 2025" emphasised on resuming trade negotiations, resolution of market access related issues, cooperation on global digital standards and network security, 5G technology and beyond 5G, Joint Task Force on Artificial Intelligence, Quantum and High-Performance Computing, protection of personal data and privacy, Circular Economy, and Resource Efficiency Partnership, Partnership on Smart and Sustainable Urbanization etc.

The European Union and India have also launched a Trade and Technology Council (TTC). Under this TTC, three working groups have been established covering digital governance and connectivity, green tech, and trade.

To create cooperation between EU/EFTA and India on Standards and Policy topics, it is essential to have correct understanding of the Indian standardisation System, the procedure and process for standards formulation, key players, influencers, etc. This understanding of the Indian standards ecosystem was crucial for the Project partners to forge ahead with the Project SESEI and align with the appropriate Indian players for collaboration in areas of mutual interest and harmonization of standardization.

The **"Indian Standardization Landscape Report"**, is a comprehensive report prepared by Seconded European Standardization Expert in India (SESEI) to provide deep understating of the Indian Standards development eco-system and the important government bodies engaged in the standards development process, concerning the project priority sectors covering Digitization and Clean & Green Technologies etc.

This is the 4th Edition of the Indian Standardisation Landscape Report and through this report It is our endeavour to provide the readers with the overview of the Indian standardisation system, main standards making bodies (SDO's) and the other key players.

3. Executive summary

In the recent years, India as a country has witnessed unprecedented growth and this explosive growth in the Indian economy has been attributed to the digitalisation and rise of the country's IT/ICT/ITeS industry.

As per the latest India development Update released by World Bank, India's growth continues to be resilient despite some signs of moderation in growth. The Update notes that although significant challenges remain in the global environment, India is one of the fastest growing economies in the world. The overall growth remains robust and is estimated to be 6.9 percent for the full year with real GDP growing 7.7 percent year-on-year during the first three quarters of fiscal year 2022-23.

Emerging technologies have played a major role in fueling the growth of the Indian economy. The use of big data, cloud computing, and artificial intelligence has helped businesses in India to become more efficient and productive. As a result, the country's GDP has grown at a rapid pace.

The Indian government has also been supportive of the economic growth and fuel this growth, It has introduced various initiatives while extensively promoting the use of digital technologies and is consistently working towards strengthening the digital public infrastructure, services and inclusiveness for adoption of emerging technologies and digitization.

It has also been accepted that Standards are fundamental to technological advancement and its implementation as well for ensuring availability of a robust ecosystem. The Fourth edition of the Indian Standardization Landscape report consists of main standardization bodies in India, key players

influencing the standards development process, accreditation and certification bodies in India, their role as well as information on other SDO's National and International having their presence in India.

The foremost and important Standards Development body in India is **the Bureau of Indian Standards (BIS).** It is the National Standards body functioning under the aegis of Ministry of Consumer Affairs, Food and Public Distribution, Govt. of India.

The erstwhile Indian Standards Institution (ISI) (now Bureau of Indian Standards) was established in year 1947 with the objective of harmonious development of standardization activity in India. Over the years various methods, procedures, rules, regulations etc. were established for carrying out standardization activities in a more effective, harmonious, and efficient manner.

The Bureau of Indian Standards Act, 1986 and subsequently the **BIS Act 2016** positions BIS as the National Standards Body for the harmonious development of the activities of standardization and to establish, publish, review and promote Indian Standards, in relation to any goods, article, process, system or service by a process of consultation involving consumers, regulatory and other Government bodies, industry, testing laboratories or calibration laboratories, scientists, technologists, and members of the Committees of the Bureau through duly constituted committees.

BIS as the National Standards Body and India as a signatory to the WTO-TBT Agreement, the standards formulation activity of BIS is aligned with the 'Code of Good Practice for the Preparation, Adoption and Application of Standards'.

For formulation of Indian Standards, BIS functions through the technical committee structure comprising Sectional Committees under respective Division Councils set up for specific technologies and economic sectors. The Sectional Committees may be supported by Subcommittees, Panels and Working Groups which may be set up for dealing with specific group of subjects. The committee structure of BIS seeks to bring together all stakeholders' interest in relevant standardization areas, so that standards are developed keeping in view national interests and after taking into consideration all significant viewpoint through a process of consultation.

In line with the other international Standards Development Bodies, BIS released its Standards National Action Plan for the period of 2022-2027 (**SNAP 2022-27),** which defines the standardisation vision and mission of BIS, identifies the strategic imperatives of BIS, draws an action plan towards addressing these through various initiatives, enumerates a set of transcending priorities in standardisation, identifies key standardisation topics/subjects that are to be taken up assigning the priorities, and to be implemented in the during the period of 2022 to 2027. For all these initiatives and associated actions, the BIS technical committees would play a key role and serve as a guiding force. Under the SNAP 2022-27, Digitization, Green Energy and Sustainable Development have been identified as the key areas of focus.

The **Telecom Engineering Centre (TEC)** and the **Telecommunication Standards Development Society for India (TSDSI)** are the standardisation Bodies in the realm of ICT- Telecom and other related emerging technologies.

TEC is an engineering wing of Department of Telecom, under Ministry of Communication and majorly **contributes towards ITU (International Telecommunication Union)**. TSDSI is a constituent SDO of

Global Standards Collaboration (GSC), Partner Type-I of oneM2M (leading forums driving M2M service layer standards) as well as it is one of the seven Organizational Partners of 3GPP.

TEC as a technical body and a nodal agency of the **Department of Telecommunications**, Ministry of Communications, government of India, is responsible for drawing up of standards, generic requirements, interface requirements, service requirements and specifications for telecom products, services, and networks. The technical activities at TEC are carried out through various specialized core divisions of TEC such as Mobile Technology, 6G, Quantum Computing, Radio-communication, Satellite communication, Future Networks, Telecom Security, Internet of Things (IoT), Information Technology, Transmission, Fixed Access, Broadcasting & Convergence, MTCTE, Indigenous Manufacturing Promotion & TBT Enquiry Point etc.

A policy for adoption of Standards of Telecom Standards Development Society, India (TSDSI) and other international standards bodies into National Standards was prepared by TEC and is called 'Standardization Guide' and is based on ISO/IEC Guide 21-1 and it outlines the process to be followed and the procedure to be used by TEC, while ratifying/ adopting TSDSI /international telecom standard as National standard in India.

Recently, TEC has adopted TSDSI Transposed Standards from oneM2M Release 3 as National Standards. A total of 27 specification from oneM2M Release 3 were adopted as National Standards. Similarly, 3GPP Release 17 standard specifications (total 1227 documents) were adopted by TEC as National Standard without any changes ("identical adoption").

TEC is also the Designating Authority (DA) for Telecom Equipment and as DA is responsible for designating Conformity Assessment Bodies (CABs)/ Certification Bodies (CBs) in India to perform testing and certification of telecom products. The role of TEC as DA is also recognizing Foreign CABs/ CBs located in the territory through MRA as partner to perform testing and certification of telecom products to Indian requirements.

Telecommunications Standards Development Society of India (TSDSI) is the Standards Development Organization (SDO) for Telecom/ICT products and services in India. It was formed in year 2014 with the support of the Indian government – Department of Telecom, and its members include government agencies, industry players, and academia to develop Indian Telecom Standards, for contributing to next generation telecom standards towards oneM2M, 3GPP and drive the eco-system of IP creation in India. It is registered as a not-for-profit society, under the Indian Societies Registration Act XXI of 1860.

TSDSI develops standards for access, back-haul, infrastructure systems, solutions and services that best meet India specific Telecom/ICT needs and is based on research and innovation in India. TSDSI also plays an important role in encouraging generation of Indian IPRs in this technology intensive field and get them incorporated into international standards. The Standardization Roadmap 2.0 for the period of 2021-2023 as prepared by TSDSI identifies technology topics that are aligned with the future technological development like Security, 6G/5G Enhancements, AI/ML, Cloud, Spectrum Studies etc.

TSDSI is the full Organizational Partner in 3GPP, and is Partner Type I of oneM2M, one of the leading forums driving M2M service layer standards and is a Member of Global Standards Collaboration (GSC). TSDSI's charter includes contribution to global telecommunications standardization process by

facilitating representation of Indian requirements in international SDOs and to act as a catalyst for adoption of indigenously developed IP in global Standards. TSDSI has Cooperation agreement with ETSI and many other International SDO's.

Technical regulations and standards formulation in Automotive sector are addressed by the **Automotive Research Association of India (ARAI),** which is a co-operative industrial research association established by the automotive industry with the Ministry of Heavy Industries (MHI) and Ministry of Road Transport and Highways (MoRTH). ARAI provides technical expertise in R & D, testing, certification, homologation and framing of vehicle regulations. The Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India, has recognized ARAI as a Scientific and Industrial Research Organisation (SIRO). Further, ARAI is one of the prime Testing and Certification Agency notified by Government of India under Rule 126 of Central Motor Vehicle Rules, 1989.

India signed the UN WP 29 1998 Agreement in February 2006. It continues to actively participate in the Global Technical Regulation (GTR) formulation by contributing data and subject matter expertise. India has currently more than 70% safety regulations which are either partially or fully technically aligned with GTRs and UN Regulations while retaining Indian specific driving and environmental conditions. Regulations are reviewed periodically by AUTOMOTIVE INDUSTRY STANDARDS COMMITTEE (AISC) and amendments are recommended to the Technical standing Committee on CMVR for adoption and subsequent notification by MoRT&H under the CMVR. Since 2000, ECE Regulations have been referred to as basis for formulating Indian regulations and since 2003, increased efforts are being made to technically align with GTR / ECE. Variance from GTR / ECE exists on formatting, phraseology and administration related issues. ARAI has been assisting Government in formulating **automotive standards and regulations**. The state-of-the-art Laboratories of ARAI are well equipped with the most advanced facilities in the areas of Emission Evaluation, Noise Vibration and Harshness, Structural Dynamics, Powertrain Engineering, Computer-aided engineering, Vehicle Evaluation, Active & Passive Safety, Material Evaluation, Automotive Electronics, Forging & Heat treatment Research, and Calibration etc. ARAI also has a renowned Academy. E Mobility-Centre of Excellence, Environmental Research Laboratory, Virtual Calibration Centre, Futuristic Adaptive Smart Techniques (FAST) Laboratory are some of the recent additions to ARAI's comprehensive capabilities.

In addition to the BIS, TSDSI, TEC and few sectors specific Standards Development Bodies (SDOs) there are several other key players that influence standards development in the country and these includes the government bodies, specifically Ministries and the Industry Associations having representation of specific sectors or Industry. These Industry Associations provide inputs, expertise, and recommendations to influence the development of standards that are relevant to their respective industries. In this report, the details of these important Industry Associations have also been provided.

India's national accreditation system under the Quality Council of India (QCI) has been ranked 5th in the world in the recent Global Quality Infrastructure Index (GQII) 2021. Accreditation helps establish the competence and credibility of conformity assessment bodies (CABs) which perform testing, certification, inspection, etc. The National Accreditation System as per international standards in India is established by the Quality Council of India (QCI), a body established in 1997 jointly by the Department for Promotion of Industry & Internal Trade (DPIIT), Ministry of Commerce & Industry, and the Indian industry. It is operated through the constituent Boards of QCI, primarily the National Accreditation Board for Certification Bodies (NABCB), which provides accreditation to the certification, inspection, and validation / verification bodies, and the National Accreditation Board for Testing &

Calibration Laboratories (NABL), which provides accreditation to the testing, calibration, and medical laboratories. Both, NABCB and NABL are signatories to the Multilateral Recognition Arrangements of the international bodies, the International Accreditation Forum (IAF), and the International Laboratory Accreditation Cooperation (ILAC).

The Indian Landscape around Standardizations, Policy & Legislation report as detailed below provides a great insight into the Indian standardization setup.

4. Main Standardisation Bodies in India

In India, there are following main standardization bodies for standards formulation, especially concerning the Project priority sector of Digitization and Green & Clean Technologies.

- Bureau of Indian Standards (BIS)
- Telecom Engineering Centre (TEC)
- Telecommunications Standards Development Society of India (TSDSI)
- Automotive Research Association of India (ARAI)

3.1 Bureau on India Standards (BIS)

a. Overview

BIS is the National Standard Body of India under Department of Consumer affairs, Ministry of Consumer Affairs, Food & Public Distribution, Government of India. It is established under the BIS Act 2016 for the harmonious development of the activities of standardization, marking and quality certification of goods and for matters connected therewith or incidental thereto.

The Bureau of Indian Standards Act, 2016, came into effect on 12 October 2017. The highlights of the BIS Act are:

- Positions BIS as the National Standards Body.
- Align various conformity assessment schemes with global practices.
- Enables the Government of India to authorize any agency apart from BIS to certify and enforce conformity to underlying standards.
- Enables the Government to list products under a compulsory certification program on the ground of safety, health, national security, environment, and mitigation of deceptive practices.
- Enables the Government to enact the hallmarking scheme for precious metals under mandatory certification.
- Provides end-user protection measures such as security against sub-standard or generic products, compensation to the end-users, etc.

BIS through its core activities of standardization and conformity assessment, has been providing traceability and tangibility benefits to the national economy in a number of ways-

- Providing safe reliable quality goods
- Minimizing health hazards to consumers
- Promoting exports and imports substitute
- Control over proliferation of varieties etc. through standardization, certification and testing.

BIS has its Headquarters at New Delhi, and its 05 Regional Offices (ROs) are at Kolkata (Eastern), Chennai (Southern), Mumbai (Western), Chandigarh (Northern) and Delhi (Central). Under the Regional Offices are the Branch Offices (BOs) located at Ahmedabad, Bangalore, Bhubaneswar, Bhopal, Coimbatore, Dehradun, Faridabad, Ghaziabad, Guwahati, Hyderabad, Jaipur, Kochi, Lucknow, Nagpur, Parwanoo, Patna, Pune, Rajkot, Raipur, Durgapur, Jamshedpur and Vishakhapatnam, which offer certification services to the industry and serve as effective link between State Governments, industries, technical institutions, consumer organization etc. of the respective region.

b. Standards National Action Plan (SNAP) 2022-27

Bureau of India Standards (BIS) had framed the Standards National Action Plan (SNAP) in the year 2019, proposing a set of actions that would enable BIS to fulfil its mandate as the National Standards Body and deliver standards according to the market needs in an efficient and timely manner. SNAP 2019 had an implementation timeframe of 3 years which ended in 2022 following which framing of the next version of SNAP was taken up.

SNAP 2022-27 defines the standardisation vision and mission of BIS, identifies the strategic imperatives of BIS, draws an action plan towards addressing these through various initiatives, enumerates a set of transcending priorities in standardisation, identifies key standardisation topics/subjects that are to be taken up assigning the priorities, to be implemented in the next five years, i.e. 2022 to 2027. For all these initiatives and associated actions, the BIS technical committees would play a key role and serve as a guiding force.

SNAP 2022-27 will play an important role in steering the national standardization efforts which would lead to standards becoming a key enabler of India's economic aspirations. The implementation of key recommendations and strategies of the document will be pivotal in enriching and strengthening "Quality Culture" in the Nation. Read more/download>>

c. Technical Activities

Keeping in view, the interest of consumers as well as the industry, BIS is involved in various technical activities as given below:

1. Standards Formulation
2. Product Certification Scheme
3. Compulsory Registration Scheme
4. Foreign Manufacturers Certification Scheme
5. Hall Marking Scheme
6. Laboratory Services
7. Laboratory Recognition Scheme
8. Sale of Indian Standards
9. Consumer Affairs Activities
10. Promotional Activities
11. Training Services, National & International level

12. Information Services

Standards Formulation:

One of the major functions of the Bureau of India Standards (BIS) is the formulation, recognition and promotion of the Indian Standards. BIS as the National Standards Body and India a signatory to the WTO-TBT Agreement, the standards formulation activity of BIS is aligned with the 'Code of Good Practice for the Preparation, Adoption and Application of Standards' (see Article 4 and Annex 3 of WTO-TBT Agreement).

BIS has identified 16 sectors which are important to Indian Industry. For formulation of Indian Standards, BIS functions through the technical committee structure comprising Sectional Committees under respective Division Councils set up for specific technologies and economic sectors. The Sectional Committees may be supported by Subcommittees, Panels and Working Groups which may be set up for dealing with specific group of subjects. The committee structure of BIS seeks to bring together all stakeholders' interest in relevant standardization areas, so that standards are developed keeping in view national interests and after taking into consideration all significant viewpoint through a process of consultation. Decisions in BIS technical committees are reached through a process of consensus.

Till date, Bureau of Indian Standards (BIS) has formulated over 22,300 Standards for products, process specification, service sectors, code of practice, methods of test terminology. These cover important segments of economy, which help the industry in upgrading the quality of their products and services.

No. of Standards published by each Division Council of BIS		
S. No	**Technical Department**	**Total Standards**
1	Ayush Department (AYD)	0
2	Civil Engineering Department (CED)	1879
3	Chemical Department (CHD)	2023
4	Electrotechnical Department (ETD)	1843
5	Food and Agriculture Department (FAD)	2259
6	Electronics and Information Technology Department (LITD)	1658
7	Mechanical Engineering Department (MED)	1422
8	Medical Equipment and Hospital Planning Department (MHD)	1506
9	Management and Systems Department (MSD)	462
10	Metallurgical Engineering Department (MTD)	1712
11	Petroleum, Coal and Related Products Department (PCD)	1584
12	Production and General Engineering Department (PGD)	2592
13	Service Sector Department (SSD)	151

No. of Standards published by each Division Council of BIS		
S. No	**Technical Department**	**Total Standards**
14	Transport Engineering Department (TED)	1244
15	Textiles Department (TXD)	1534
16	Water Resources Department (WRD)	472
	Total	22341

Source: **Published standards**

As a policy, while developing any Indian Standard, BIS technical committees consider the availability of an International Standard (International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) on the subject. The committees try to align the standard with the international standards to the extent possible at times, ISO/IEC standards are not adopted in totality by the concerned technical committee taking into account the country specific concerns on health, safety, environment, national security and prevention of deceptive practices. At present, as per the PIB Delhi, over 87% of the Indian standards are harmonized with ISO/IEC standards for which the International Standards exists.

Product Certification Scheme:

BIS through BIS Act, 2016 operates a product certification scheme for standardization of goods that enter the market for sale to consumers. Under the product certification scheme – I, BIS grants licence to use the standard mark or grants certificate of conformity as per conformity assessment schemes given in BIS (Conformity Assessment) Regulations, 2018 . The conformity assessment schemes are laid down in BIS (Conformity Assessment) Regulations, 2018 which are based on principles laid down in IS/ISO/IEC 17067: 2013.

The Product Certification Scheme aims at providing Third Party assurance of quality, safety, and reliability of products to the customer. Presence of BIS certification mark, known as Standard Mark, on a product is an assurance of conformity to the specifications. The manufacturer is permitted to self-certify the licenced products after ascertaining its conformity to the standard. Though its surveillance operations, the Bureau maintains a close vigil on the quality of certified goods. The conformity is ensured by regular surveillance of the licensee's performance by surprise inspections and testing of samples, drown both from the market/factory.

Although, the scheme itself is voluntary in nature, the Government of India, on considerations of public health and safety, security, infrastructure requirements and mass consumption has enforced compulsory certification on various products through Orders issued from time to time under various Acts.

To ensure enhanced consumer safety & compliance to statutory provisions, some products like gas cylinders, regulators and valves, BIS certification scheme requires each lot or batch to be inspected by BIS certification officers before release of the product.

There are three types of product certification scheme:

1. Domestic Manufacturers Certification Scheme
   i. Normal Procedure
   ii. Simplified Procedure
2. Foreign Manufacturers Certification Scheme
3. ECO Mark Scheme

Domestic Manufacturers Certification Scheme

The applicant may choose one of the two options available for grant of licence:

Option 1: The applicant is required to submit the filled in application along with required documents and requisite fee to the Branch Office under whose jurisdiction the manufacturing unit is located. Subsequently, after recording of the application, a preliminary factory evaluation is carried out by BIS officer to ascertain the capability of the applicant/manufacturer to produce goods according to the relevant Indian Standard and to verify the availability of complete testing facility and competent technical personnel. Samples are tested in the factory and drawn for independent testing. Grant of license is considered by BIS provided the samples pass during independent testing, preliminary evaluation is satisfactory, and the applicant agrees to operate the defined Scheme of Testing & Inspection and pay the prescribed marking fee. By this procedure, the license is expected to be granted within 4 months of recording of application by BIS and 6 months in case of all India first license for a product.

Option 2: In this procedure, the applicant is required to submit test report(s) from specified laboratories along with the application. Grant of license is considered provided the verification visit is found to be satisfactory and the applicant agrees to implement the defined scheme of testing and inspection and pay the prescribed marking fee. Sample(s) is (are) drawn during the verification visit for independent testing, but the conformity of this sample does not form a pre-condition for grant of license. However, the test result is used for review purpose.

***Guideline for grant of license is available here. Click here** to refer BIS Act 2016, BIS Rules 2018, BIS (Conformity Assessment) Regulations 2018 and various guidelines framed there under.*

Foreign Manufacturers Certification Scheme

Bureau of Indian Standards (BIS) has been operating a Foreign Manufacturers Certification Scheme (FMCS) since the year 2000 under BIS Act, 2016 and Rules & Regulations framed there under. Under FMCS, license is granted to a Foreign Manufacturer for use of Standard Mark on a product that conforms to an Indian Standard. The standards may be under mandatory or voluntary certification.

The license is granted by Foreign Manufacturers Certification Department (FMCD) located at BIS Headquarters, New Delhi. The BIS license is granted for a location where the product is manufactured and tested as per relevant Indian Standard(s) and Standard Mark is applied on the product conforming to such Indian Standard(s). Click here to read more about FMCS.

Note: The Scheme is applicable for grant of licence for all products except Electronics & IT Goods notified by MeitY.

ECO Mark Scheme

Government of India instituted "ECO Mark Scheme" for labeling of environment friendly products. The Scheme is being administered by the Bureau of Indian Standards. The Scheme covers various product categories like Soaps and Detergents, Paints, Food Items, Lubricating Oils, Packing/Packaging Materials, Architectural Paints and Powder Coatings, Batteries, Electrical and Electronic Goods, Food Additives, Wood Substitutes, Cosmetics, Aerosols and Propellants, Plastic Products, Textiles, Fire-extinguisher, Leather and Coir & Coir Products. The presence of ECO Logo along with ISI Mark on a product indicates that the product meets certain Environmental criteria along with the Quality requirements as specified in the relevant Indian Standard.

The combination of ISI Mark and ECO Logo is as given below:

To operate the Scheme, BIS has included additional requirements for ECO Mark in the concerned Indian Standards. The terms and conditions governing operation of the Licence shall be as per the Bureau of Indian Standards Act, Rules and the Regulations framed thereunder.

For more information please click here and the list of products under compulsory certification scheme-I (ISI mark scheme) is available here

Compulsory Registration Scheme:

Ministry of Electronics and Information and Technology (MEITY) along with Bureau of Indian Standards (BIS) introduced Compulsory Registration Scheme (CRS) in 2012 with the objective to curb sale of spurious imported products in the country. Under this scheme it is mandatory for manufacturers to get their products registered before launching them in market. Since then, Government of India has notified around 81 electronic products that require mandatory registration under the Bureau of Indian Standards (BIS) before sale in the country.

Compulsory Registration Scheme (CRS) is being operated by BIS as per the provision of Scheme - II of the BIS (Conformity Assessment) Regulations, 2018 for the product categories notified by MEITY and MNRE.

Overseas Manufacturers are required to have a local representative in India who will represent the manufacturer locally and will be responsible for placing the product in the market. To make this program robust, Market Surveillance has been designed to ensure compliance.

For more information about CRS please *Click here and for the list of product categories, please click here.* The *list of BIS approved labs is available here.*

Laboratory Recognition Scheme (LRS):

To protect consumer's interest, BIS operates various conformity assessment schemes. Under these schemes, BIS grants licenses/registrations to such manufacturers who are capable of producing goods conforming to relevant Indian Standards, on continuous basis. To support these scheme, which requires testing of products on regular basis for checking conformity to the relevant Indian Standards, BIS has established a network of eight laboratories. For list of BIS laboratories click here.

As it is neither physically possible nor economically viable for BIS laboratories to develop testing facilities for each and every product covered under BIS Product Certification Scheme, a Laboratory Recognition Scheme (LRS) has been formulated with the objective of having sufficient number of outside laboratories in India and abroad to cater to the needs of Product Certification Scheme. Please click here for the list of BIS Recognized Lab.

The Laboratory Recognition Scheme (LRS) is governed by the provisions under Section 13 (4) of The BIS Act 2016 and the BIS Rules, 2017 [32 (2), (3) & (4). These statutory provisions confer upon BIS, powers to recognize any laboratory in India or in any other country for carrying out testing of samples in relation to use of the Standard Mark and such other functions as may be necessary. The Rules also provide for de-recognition of a recognized laboratory by the Bureau for non-fulfilment of any condition laid down at the time of recognition. The guidelines for recognition and de-recognition of the laboratories have been laid down in this Scheme. BIS also maintains a record of such laboratories as are recognized by it for testing of samples of articles or processes in relation to relevant Indian Standards. For more information, please click here>>

Standardisation Cell

The Standardization Cell is an institutional mechanism for effective coordination & synergy with Bureau of Indian Standards (BIS) for a robust quality ecosystem in the country. The Standardization Cell in Ministries/Departments/Industry Associations is envisaged to act as a channel of communication among the government, industry and BIS to facilitate the identification of new subjects and relevant experts for standardization in different sectors. The cell will also facilitate the availability of timely inputs on standardization and enhance implementation of standards.

SDO Recognition Scheme

As per BIS Act, 2016, BIS may recognize or accredit any institution in India or outside which is engaged in standardization. As the National Standards Body, it is the responsibility of BIS, to ensure that there is synergy in the standardization work taking place in the country and that there is no overlap or duplication of the work carried out by other Standards Developing Bodies.

To attain the One Nation One Standard vision of the Government of India, BIS launched a scheme which provides for Recognition of SDO. A number of government organizations have applied to Bureau of Indian Standards (BIS) for recognition under the BIS scheme of Standards Development Organizations (SDOs). In May 2021, the Research Design and Standards Organization (RDSO), Ministry of Railways, has been granted the first recognition under the Scheme for Recognition of SDOs in the country. The recognition is valid for 3 years and will require renewal after completion of the validity period.

Learn Science by Standards initiative

BIS has announced the launch of 'Learning Science via Standards', a unique initiative for students for learning science via standards. The 'Learning Science via Standards' initiative focuses on a series of lesson plans aimed to use scientific concepts, principles and laws to help students understand their practical applications in manufacturing, functioning and testing of quality characteristics of different products as stated in the relevant Indian Standards. The subjects for the lesson plans are largely related to products used in day-to-day life and have been chosen based on their relevance to education as part of the course curriculum as well as to industrial applications. The 'Learning Science via Standards' initiative is expected to benefit a wide range of students, including those in schools, colleges, and technical institutions. It will also contribute towards their capacity building to engage successfully in a variety of economic sectors in the country.

d. International Collaborations

International Cooperation and Agreements:

Bureau of Indian Standards (BIS) as the National Standards Body of India has been participating in International Standardization activities and projecting India's interest during various stages of the development of International Standards. BIS is a member of International Organization for Standardization (ISO) and through the Indian National Committee (INC) is a member of International Electrotechnical Commission (IEC). BIS is also a member of regional standards bodies like Pacific Area Standards Congress (PASC), South Asian Regional Standards Organization (SARSO) and under the framework of IBSA (India, Brazil and South Africa).

To facilitate acceptance of Indian products in the International Market, BIS has been to extent possible harmonizing its standards with ISO/IEC standards by adopting these standards as Indian Standards. At present, over 85% of the Indian standards are harmonized with ISO/IEC standards for which the International Standards exists.

BIS has also entered into MoUs with NSBs of many countries (refer section Bilateral Co-operations below).

BIS and ISO:

BIS has been an active member and has been contributing to policy as well as in technical matters related to international standardization. BIS has also been to the extent possible harmonizing its standards with the standards of ISO by adopting these standards as Indian standards.

At the policy level, India:

- Periodically served as a member of the ISO Council.
- Currently a Member of Technical Management Board of ISO from January 2023 to December 2025.
- Participating member of ISO Policy Development Committees on Developing Country Matters (DEVCO), Committee on Conformity Assessment (CASCO), Committee on Consumer Policy

(COPOLCO), Committee on Reference Materials (REMCO) and Technical Management Board – Groups (TMBG).

- Holds Convenorship of the DEVCO Working Group on 'Resources to enhance NSB capabilities in standards development and use.

India (BIS) is also actively involved in the international standardization work in the various technical committees and working groups of ISO by participating in these committees, proposing and leading new subjects of standards development, holding Secretariat responsibilities of technical committees, holding Chairmanships or Convenorships of Committees/Working Groups, etc. At present India is a Participating (P) member of 500 committees and Observer (O) member in 181 committees. India participates in the ISO technical committees through corresponding National Mirror Committees of BIS. Participation in ISO work is through participation of delegation of experts where important in the committee meetings, by commenting on documents and by voting on documents through electronic voting system. Indian experts are participating in work of over 400 different working groups of ISO TCs.

India also holds the Secretariat of 11 ISO committees and Convenorship of 21 ISO working groups.

The committees for which BIS holds the Secretariat are as follows:

S. No	BIS Committee No.	BIS Committee Title	International Committee No.	International Committee Title
1	FAD-9	Spices And Condiments	TC 34 / SC 7	Spices, Culinary Herbs and Condiments
2	LITD-14	Software And System Engineering	TC 1 / SC 7	Software and Systems Engineering
3	CHD-17	Leather, Tanning Materials and Allied Products	TC 120	Leather
4	CHD-17	Leather, Tanning Materials and Allied Products	TC 120 / SC 1	Raw hides and skins, including pickled pelts
5	CHD-17	Leather, Tanning Materials and Allied Products	TC 120 / SC 2	Tanned Leather
6	CHD-17	Leather, Tanning Materials and Allied Products	TC 120 / SC 3	Leather Products
7	MED-24	Security Equipment	TC 332	Security equipment for financial institutions and commercial organizations
8	CHD-35	Air Quality	TC 146 / SC 1	Stationary Source Emissions
9	WRD 1	Hydrometry	TC 113	Hydrometry
10	WRD 1	Hydrometry	TC 113/SC 1	Velocity area methods
11	WRD 1	Hydrometry	TC 113/SC 6	Sediment transport

BIS and IEC:

India started taking part in IEC from 1911. BIS took over the responsibility of Indian National Committee of IEC (INC-IEC) in 1949 from Institution of Engineers. Since, then the INC-IEC is actively participating in the activities of the IEC both at the policy level and technical work and carrying out the responsibilities as member body of IEC Council.

- Presently, India is a member of IEC Standardization Management Board (SMB) and Market Strategy Board (MSB), the highest policy-making bodies of IEC responsible for technical matters and for identifying relevant subject areas for future work respectively.
- India has participating member status in 120 Technical Committees and observer member status is 54 Technical Committees of IEC. India holds the convenorship on 14 IEC committees. Participation in IEC work is done through participation of delegation of experts in the committee meetings, by commenting on documents and by voting on documents through electronic voting system.
- India holds the Chairmanship of the IEC Systems Committee on 'Low Voltage Direct Current (LVDC) and LVDC for electricity access' and of IEC/TC 33 'Power capacitors and their applications.

Bilateral Co-operations:

BIS is also actively involved in bilateral cooperation with National Standards Bodies of other countries and with other Standards Developing Organizations for co-operation in areas of standardization, testing, certification, training etc. BIS has signed Memorandum of Understanding (MoU) in the fields of standardization and conformity assessment and is in the process of having such arrangements with several other countries. In addition, BIS has also signed Bilateral Cooperation Agreements (BCA)/Mutual Recognition Agreements (MRA) with the National Standards Bodies of several countries. BIS also plays an active role in formulation and implementation of regional standards and on conformity assessment scheme for the SAARC countries under the South Asian Regional Standards Organization (SARSO).

List of important MoUs and BCAs/MRAs signed with countries/organizations:

List of important MoUs and BCAs/MRAs				
S. No.	**Country**	**Organization**	**Total of MoU/Bilateral Cooperation**	**Document**
1	------	ISO	Memorandum of Understanding (MoU) the Bureau of Indian Standards (BIS) – National Institute of Training for Standardization (NITS) and the International Organization for Standardization (ISO)	View
2	European Union	CEN	MoU for national adoption of CEN Standard EN 115:1995 + A1:1998 + A2:2004 "Safety rules for the construction and installation of escalators and passenger conveyers" in India	View
3	European Union	ETSI	Memorandum of Understanding between The Bureau of Indian Standards and The European Telecommunication Standards Institute	View

4	European Union	CEN-CENELEC	Memorandum of Understanding between Bureau of Indian Standards and European Committee for Standardization and European Committee for Electrotechnical Standardization	View
5	Germany	DIN	Memorandum of Understanding (MoU) between Bureau of Indian Standards, New Delhi represented by the Director General Mr. Svayam Prakash Sharma and DIN Deutsches Institut für Normung, Berlin represented by Director Dr-Ing. Torsten Bahke on cooperation and mutual interest in the fields of standardization and certification	View
6	Germany	DKE	Memorandum of Understanding between Bureau of Indian Standards, New Delhi and DKE German Commission for Electrical, Electronic and Information Technologies of DIN and VDE, Frankfurt am Main	View
7	Greece	The National Quality Infrastructure system/ Hellenic Organization for Standardization (NQIS/ ELOT)	Memorandum of Understanding (MoU) between the Bureau of Indian Standards (BIS) and The National Quality Infrastructure system/ Hellenic Organization for Standardization (NQIS/ ELOT) in the field of standardization	View
8	USA	BIS, ANSI & CII	MoU to establish an India - U.S. Standards Portal between BIS, CII and the American National Standards Institute (ANSI)	View
9	USA	American National Standards Institute (ANSI)	MoU between BIS and the American National Standards Institute	View
10	USA	Underwriters laboratories (UL)	Memorandum of Understanding between Bureau of Indian Standards and Underwriters Laboratories Inc. (UL)	View

BIS also participate and follow India-Brazil-South Africa (IBSA) Dialogue Forum. http://www.ibsa-trilateral.org/

Complete list of MoUs and BCAs/MRAs signed by India with countries/organizations is available here

BIS WTO-TBT Enquiry Point

Ministry of Commerce, the nodal ministry for WTO matters in India, has designated Bureau of Indian Standards as the WTO TBT Enquiry Point for India for all queries except those related to the telecom sector (for which the TBT Enquiry Point is Telecommunication Engineering Centre - TEC). For more details about the WTO-TBT Enquiry Point and to see WTO-TBT Notifications please click here

3.2 Telecommunication Engineering Centre (TEC)

a. Overview

The **Telecommunication Engineering Center** (TEC) is a technical body and a nodal agency of the **Department of Telecommunications**, Ministry of Communications, Government of India responsible for drawing up of standards, generic requirements, interface requirements, service requirements and specifications for telecom products, services and networks.

TEC functions are as below:

- TEC is a technical body representing the interest of Department of Telecom, Government of India.
- Prepare specification of common standards with regard to Telecom network equipment, services and interoperability.
- Specifications released as Generic Requirements (GRs), Interface Requirements (IRs) and Service Requirements (SR).
- Issuing Interface Approvals, Certificate of Approvals, Service Approvals & Type Approvals.
- Formulation of Standards and Fundamental Technical Plans.
- Interact with multilateral agencies like APT, ETSI and ITU etc. for standardization.
- Develop expertise to imbibe the latest technologies and results of R&D.
- Provide technical support to DoT and technical advice to TRAI & TDSAT.
- Coordinate with C-DOT on the technological developments in the Telecom Sector for policy planning by DoT.
- Designated National Enquiry point for WTO –TBT (Technical Barrier to Trade) for telecom sector.

TEC has four Regional Centres called RTECs. These are RTEC (NR) at New Delhi, RTEC (ER) at Kolkata, RTEC (WR) at Mumbai and RTEC (SR) at Bengaluru. RTECs are responsible for testing and certification of products, equipment and systems. It carries out Certification & Approval of Telecom Products against TEC standards/specifications i.e.GR/IR/ER of TEC or applicant's own specifications. RTECs carry out testing, evaluate the test reports and accord approval for issue of Type Approval Certificate (TAC)/ Interface Approval certificate (IAC)/ Certificate of Approval (COA). RTECs also carry out evaluation of test reports for MTCTE certification and recommends for issue of MTCTE certificate to TC Division.

Each of the RTEC is headed by a Dy. Director General. The coordination of activities of RTECs and issue of certificate is vested with Regional Coordination (RC) Unit at TEC New Delhi headed by a DDG.

Main Functions of RTEC:

- Acceptance of application for issue of new certificate or renewal of old certificate against TEC standards/specifications i.e. GR/IR/ER or manufacturers own specifications
- Issue of demand letter for test fee as per latest TEC tariff
- Acceptance of fee and Registration of application for issue of certificate

- Testing of equipment and evaluation of test reports as per TEC standards
- Renewal/ Modification of IAC and TAC for cases related to change of name/address of applicant/OEM.
- Handling of queries and interaction with Manufacturers/ Traders/Vendors under their jurisdiction

Other Functions:

- Evaluation of test reports for MTCTE Certification and submission of comments to TC Division.
- Assessment of infrastructure for the testing capability of test labs for CAB designation along with MRA division.
- Involvement in testing of Equipment for Technology Approval as per TEC GR along with concerned Expert Groups of TEC.
- Testing and evaluation of test reports for Proof of Concept (PoC)/ Traffic Trial of telecom various projects.
- Participation in Development Coordination Committees (DCC) and Sub-DCC committees for development of TEC standards i.e. GR/IR/SRs of products.
- Dissemination of knowledge about technological developments and coordination of research and industry in the field of Telecommunication

For more information, please click here>>

b. Standardization Policy

Telecommunications Engineering Centre (TEC), Department of Telecommunication (DOT) has approved a policy for adoption of standards of Telecom Standards Development Society, India (TSDSI)/international standards bodies into National Standards. TEC's policy document called 'Standardization Guide' based on ISO/IEC Guide 21-1 outlines the process to be followed and the procedure to be used by TEC, while ratifying/ adopting TSDSI /international telecom standard as National standard in India. It has further been notified by TEC vide Office Memorandum No. 2-1/2018/SD/TSDSI/TEC/5 dated 8th May 2020.

The main points of the Standardization Guide are as given below:

1. TEC will adopt the standards after wide public consultation process instead of ratification (ratification doesn't include public consultation).
2. For adoption, ISO/IEC – Guide 21 has been used as guide document.
3. The standards should be adopted by TEC as National Standards. National Standards adopted shall be voluntary unless made mandatory by its use, reference or adoption by regulation/ Government directive.
4. The adoption may be parallel adoption i.e. during standard development phase (where TEC is participating in standard development) or after publication of the standard by TSDSI / international standard body.
5. TEC shall implement the standard adoption process with the help of institutional framework which will consist of:
   - Telecom Standards Advisory Committee (TSAC)
   - Consultative Committees (CC)
   - Task Force (TF) setup for the purpose
   - Standardization Secretariat

6. IPR shall not be subject matter of adoption.
7. If subsequent to adoption of TSDSI/ any other SDO standard by TEC, the Global Standards Body like ITU etc. accepts/adopts a revised/ amended version of the parent International Standard, then TEC may adopt such revised/ amended version.

Please click here to download "Standardization Guide"

c. Technical Activities

The technical activities at TEC are carried out through various specialized core divisions of TEC such as Mobile Technology, 6G Technogym & Quantum Computing, Radio-communication, Satellite communication, Future Networks, Telecom Security, Internet of Things (IoT), Information Technology, Transmission, Fixed Access, Broadcasting & Convergence, Standardization, MTCTE, Indigenous Manufacturing Promotion & TBT Enquiry Point etc. List of Divisions and their work areas in short is given in below table.

S. No.	Division	Work Areas
1	6G Technologies	6G Technologies; Quantum Communication Technologies; Next Generation Passive Optical Network; Green Telecommunication and Emergency and Mission Critical Communication (Public Protection and Disaster Relief) etc.
2	Access Lab (AL)	Setting up Access Lab
3	Administration (A)	Administration, management, and material management related activities etc.
4	Control Lab (CL)	Setting up of Control Lab
5	Convergence & Broadcasting (C&B)	Artificial Intelligence; Broadcasting; Convergence; Distributed Ledger Technology/ Blockchain; Emerging Technologies etc.
6	Customer Premises Equipments & Terminals Lab (CPE & TL)	Setting up of Customer Premises Equipments & Terminals Lab (CPE & TL)
7	Fixed Access (FA)	Fixed Access Technology, Reduction of Carbon footprint, E-Waste, Energy Efficiency & Green Telecom etc.
8	Future Networks (FN)	Future Network & Technology Development, Broadband Network Policy Initiatives & Technology Solutions, Preferential Market Access (PMA) methodology etc.
9	Indigenous Manufacturing Promotion & TBT Enquiry Point (IMP & TEP)	Matters related to policy & implementation of DoT PPP MII order, handling all matters related to TEC in DoT PLI scheme, Establishment & Operation of WTO TBT Enquiry Point (of telecom sector) in TEC and other works related to WTO TBT Agreement, Working with DoT and other organizations for devising & promoting special schemes like Phased Manufacturing Programme (PMP) in telecom & related ICT sector.

10	Industry Coordination (IC)	Handling matters related to industry issues/ grievances and pilot trials of new upcoming technologies.
11	Information Technology (IT)	IPv6 implementation, Standardization of IT equipment & Services etc.
12	Internet of Things (IoT)	IoT/M2M, Study and Standardization of M2M Gateway and Architecture, Smart Power, Smart Automotive, Smart Health, Smart Safety and Surveillance solutions etc.
13	Mobile Technologies (MT)	5G, LTE-Advance, LTE, WCDMA (including HSDPA, HSUPA, HSPA, HSPA+ etc.), CDMA 2000 1X, WIMAX, Numbering Plan etc.
14	MTCTE	Policy and Operational Aspects of MTCTE, Management of TBT Enquiry Point etc.
15	Personnel & Training (P&T)	Handling personal matters of staff and the organization
16	Radio (R)	Terrestrial Radio Communication & Ground Equipment for Satellite Communication Systems, Radio wave propagation Studies, Spectrum, EMI/EMC Standard, Disaster management, Safety etc.
17	Regional Coordination (RC)	Activities related to testing & certification of telecom products of the RTECs etc.
18	Safety Lab (SL)	Work related to ISO 9001: 2015 Certification etc.
19	Standardization (SD)	Standardization in ICT, Cross-sector standardization co-ordination etc.
20	Telecom Security (TS)	Operation of NGN Transport lab, IPv6 Ready lab, Setting up a Telecom Security Test lab in TEC etc.
21	Telecom Skill Development (TSD)	Facilitating manpower training for MTCTE, students training in telecom sector, etc.
22	Transmission (TX)	Optical Transport and Optical Fiber Cables/systems, Transmission synchronization equipment etc.

For more information please click here>>

Labs in TEC:

- Access Lab (AL)
- Control Lab (CL)
- Customer Premises Equipments & Terminals Lab (CPE & TL)
- IPv6 Ready Logo Test Lab
- Next Generation Network (NGN)
- SAR Lab
- Security Lab (SL)

I. Procedures and Guidelines for formulation of TEC Standards / Documents

In May 2008, Network Conformity Standards System & Procedures CSSP was formulated for Standardization of process & procedures, numbering scheme, structure of TEC documents viz. Generic Requirements (GR)/Interface Requirements (IR)/Service Requirements (SR)/ Test Schedule and Test Procedure (TSTP). It also envisaged the process for formulation of documents i.e., GR/IR/SR etc. through involvement of Groups, Committees and Forums along with their modification, withdrawal, and review.

Subsequently, it was decided to convert existing TEC documents (GR/IR/SR etc.) into Standard documents and provide a new numbering scheme. This revised version of Procedures and Guidelines for Formulation of TEC Standards/Documents erstwhile CSSP after consultation with concerned TEC Divisions, also includes the formulation of Essential Requirements (ERs) with the launch of Mandatory Testing and Certification of Telecommunications Equipment (MTCTE) from August 1, 2019.

The purpose of this document is to outline the process to be followed and the procedure to be used by TEC, for formulation of:

- TEC Standards (erstwhile specifications viz. GRs/IRs/SRs/SDs)
- Test Guide (erstwhile TSTP) associated with TEC Standards.
- Essential Requirements (ERs) and
- Adoption of Standards.

The document also contains the framework for the procedure for formulation of:

- Committees
- Sub-Committees and
- Forums

These Committees/Sub-Committees/Forums are formed for development of TEC documents including revision of documents, as mentioned above. Read more/Download>>

II. Mandatory Testing and Certification of Telecom Equipments (MTCTE)

The Department of Telecommunications, Ministry of Communications, Government of India vide Gazette Notification No. G.S.R. 1131(E) dated 5th September 2017 has amended the Indian Telegraph Rules, 1951 (Amendment 2017) to introduce Mandatory Testing & Certification of Telecom Equipment (MTCTE). Telecommunication Engineering Centre (TEC) is implementing MTCTE in India in phases. In MTCTE, every telecom equipment needs to undergo mandatory testing and certification prior to sale, import for use in India. The testing is to be carried out for conformance to Essential Requirements for the equipment, by Indian Accredited Labs designated by TEC and based upon their test reports, certificate shall be issued by TEC.

MTCTE covers 55 types of telecom products along with associated variants.

The products covered in Phase-I are:

- 2-Wire Telephone Equipment
- G3 Fax Machine
- Modem
- Cordless Telephone
- ISDN Customer Premises Equipment

- Private Automatic Branch Exchange

Following products listed under Phase 2:

- Passive Optical Network (PON) family
- Feedback Devices
- Transmission Equipment (SDH, Multiplexing Equipment)

Products listed under Phase 3:

- Base station for cellular network
- Repeater for cellular network
- Compact cellular network
- Smart electricity meter
- Tracking device
- Internet of Things (IoT) Gateway
- End-point device for environmental monitoring
- Equipment operating in 2.4 & 5Ghz band

List of products covered under Phase 4:

- Transmission terminal equipment
- Optical fiber (single mode)
- Optical Fibre Cable
- Satellite communication equipment
- Radio Broadcast Receiver
- Mobile radio trunk system
- High Frequency (HF) radio
- VHF/UHF radio system equipment
- PTP/PMP (Point-to-Point/Point-to-Multipoint) microwave fixed radio system
- IP security equipment
- Router
- LAN (Local Area Network) switch
- Precision time control Grandmaster equipment
- IP multimedia conferencing equipment
- Mobile Management Entity
- Conferencing equipment
- Signaling Gateway
- Media Gateway
- Softswitch
- Digital Subscriber Line equipment
- Session border controller
- Base Station Controller
- Mobile Switching Centre (MSC)
- Equipment Identity Register (EIR)
- Subscriber Identity Module (SIM)
- OTA (Over The Air) platform & device manager platform
- Infiniband Switch
- Home Location Register

- Serving GPRS (General Packet Radio Service (mobile data standard on the 2G and 3G cellular communication networks)) support node
- Serving gateway
- Mobile management entity
- Short Message Service Centre (SMSC)
- Cell Broadcast Centre
- Service Control Point (SCP)
- Operation Maintenance Centre (OMC)
- Gateway Mobile Location Centre (GMLC)
- Service Mobile Location Centre (SMLC)

For more information about MTCTE, please click here>>

III. Conformity Assessment

TEC has been appointed as the Designating Authority (DA) for Telecom Equipment. TEC as DA will be designating Conformity Assessment Bodies (CABs)/ Certification Bodies (CBs) located in India to perform testing and certification of telecom products. The role of TEC as DA is also to recognizing Foreign CABs/ CBs located in the territory of MRA partner to perform testing and certification of telecom products to Indian requirements.

The following documents lay down the procedures and criteria for designating Conformity Assessment Bodies for testing and/or certifying the MRA partnership requirements. The document also lays down the procedure for recognizing Foreign CABs/ CBs designated by the MRA partners to certify to Indian requirements. To qualify for designation/ recognition, the CABs/ CBs must fulfill the criteria as given in the scheme at clause no. 9.

- Scheme for Designating Domestic Testing and Certification Bodies for Conformity Assessment of Telecommunication Equipment (New Scheme of CAB Designation-Issue 3-TEC 04019:2023 - effective from 19.04.2023)
- Scheme for Recognising Foreign Testing and Certification Bodies for Conformity Assessment of Telecommunication Equipment (Issue 2- December 2017)

TEC as the Designating Authority reserves the right to amend and introduce new requirements to this scheme as and when required.

A Conformity Assessment Body (CAB)/ Certification Bodies (CBs) in India interested in certifying and/or testing of any telecom products to the requirements of a foreign country/custom territory that has entered into Mutual Recognition Agreement or Arrangement with India need to apply to TEC. Similarly, the Foreign CABs/CBs designated by the MRA partner may apply for Recognition for testing and /or certifying the Indian requirements.

At present, India has Mutual Recognition Agreement or Arrangement (MRA) with Singapore in Telecom Sector. IDA Singapore has scheme for recognition of CAB / CBs which gives details of their Telecom Specifications and Test Procedure. Details about Singapore on Telecom sector is available at Infocomm Development Authority (IDA), Singapore.

- CAB details w.r.t. Test parameters
- Click here for payment for CAB through NTRP (online)
- Provisional Designation for Domestic Conformity Assessment Bodies (CABs)

- Designation of Labs as Conformity Assessment Body (CAB) for 5G Products
- Labs (CAB) Designated by TEC
- CAB Designation withdrawn

For more information, please click here>>

d. International Collaborations

TEC has established international cooperation with various organizations and countries to enhance the exchange of knowledge and expertise in the field of telecommunications.

- 3rd Generation Partnership Project (3GPP)
- European Telecommunications Standards Institute (ETSI)
- OneM2M
- International Telecommunication Union (ITU): National Working Groups corresponding to ITU Study Group
- Institute of Electrical and Electronics Engineers (IEEE)
- Internet Engineering Task Force (IETF)
- Asia Pacific Telecommunity (APT)
- Open Community for Ethics in Autonomous and Intelligent Systems (OCEANIS)

3rd Generation Partnership Project (3GPP)

TEC has taken individual membership of 3GPP through Department of Telecommunications. Through this, TEC participates in various meetings, seminars, workshops of 3GPP. TEC has also taken up adoption of 3GPP standards transposed by Indian SDOs like TSDSI. TEC has initiated the process of adoption of TSDSI transposed standards corresponding to the new and updated specifications of 3GPP Release 15, 16 and 17 (total 2579 documents) as National Standard.

TEC also refers various 3GPP standards and specifications in its various specifications like Generic Requirements (GR), Interface Requirements (IR), System Requirements (SR) and Essential requirements (ER) for telecom equipment, networks, systems and services.

OneM2M

TEC through TSDSI participates in standardization activities at oneM2M. TEC has also approved adoption of TSDSI transposed oneM2M Release 2 in September 2020 and Release 3 in August 2022. These National standards are available on the TEC website. These national standards shall be voluntary unless made mandatory by its use, reference, or adoption by regulation or Government directive.

International Telecommunication Union (ITU)

Department of Telecommunications is the nodal department representing government of India in ITU and TEC is the body coordinating the Indian activities corresponding to ITU-T study groups. TEC is having following National Working Groups (NWGs) in line with ITU-T Study Groups:

S. No.	Name of the NWG	Corresponding Study Group	Activities
1	NWG 2	ITU-T SG 2	Operational aspects of Service provision and Telecommunication Management
2	NWG 3	ITU-T SG 3	Tariff and Accounting Principles and international telecommunication/ICT economic and policy issues
3	NWG 5	ITU-T SG 5	Environment and circular economy
3	NWG 9	ITU-T SG 9	Broadband Cable and TV
4	NWG 11	ITU-T SG 11	Protocols and test Specifications
5	NWG 12	ITU-T SG 12	Performance, QoS and QoE
6	NWG 13	ITU-T SG 13	Future Networks (&Cloud)
7	NWG 15	ITU-T SG 15	Transport, Access and Home
8	NWG 16	ITU-T SG 16	Multimedia and related digital technologies
9	NWG 17	ITU-T SG 17	Security
10	NWG 20	ITU-T SG 20	IoT, smart cities & communities
11	NSG 5	ITU-R SG 5	Radiocommunication

3.3 Telecom Standards Development Society of India (TSDSI)

a. Overview

Telecommunications Standards Development Society of India (TSDSI) is a membership based, Standards Development Organization (SDO) for Telecom/ICT products and services in India. TSDSI was formed in 2014 with the support of the Indian government, and its members include government agencies, industry players, and academia to create an Indian Telecom Standards Development Organization (TSDO), for contributing to next generation telecom standards and drive the eco-system of IP creation in India. It is registered as a not-for-profit society, under the Indian Societies Registration Act XXI of 1860.

Objectives of TSDSI are:

- Developing, promoting and standardizing India-specific Telecom/ICT requirements and solutions

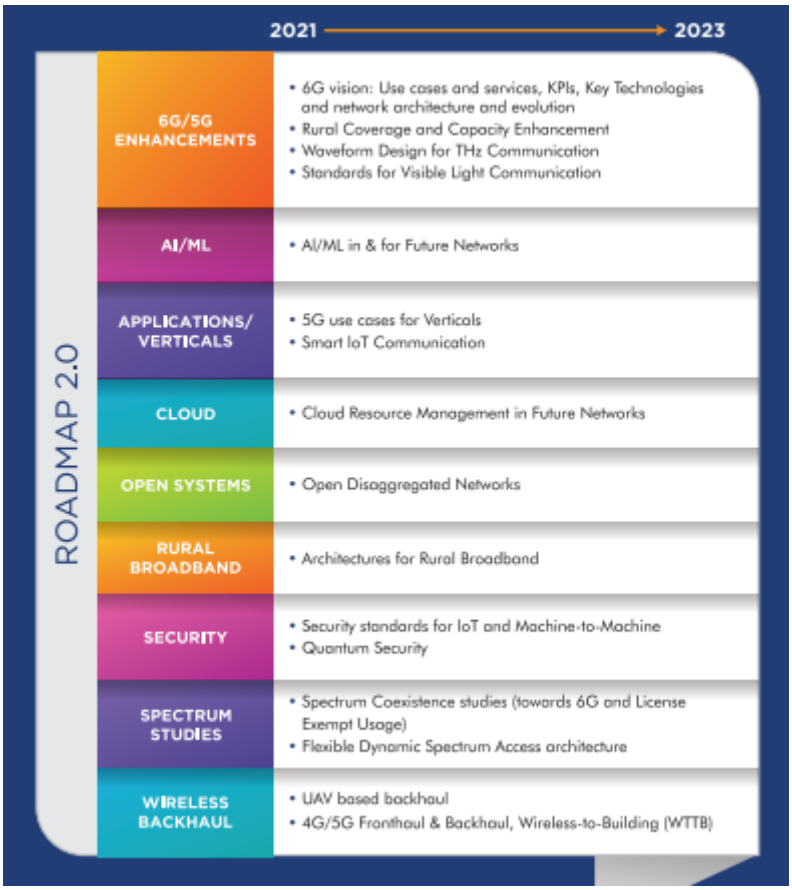
- Working closely with global standards' bodies to reflect Indian requirements into international telecom/ICT standards
- Helping create standards-based manufacturing expertise in the country
- Providing guidance and leadership to developing countries

TSDSI develops standards for access, back-haul, and infrastructure systems, solutions and services that best meet India specific Telecom/ICT needs, based on research and innovation in India. TSDSI also plays an important role in encouraging generation of Indian IPRs in this technology intensive field and get them incorporated into international standards. This in turn promotes indigenous research, product development and manufacturing. TSDSI has a sound IPR policy in place. You can read/download TSDSI IPR Policy here>>

Department of Telecommunications & Ministry of Electronics and Information Technology, Govt. of India are jointly supporting TSDSI as India's Telecom/ICT SDO. For more information about TSDSI please click here>>

b. Standardization roadmap 2.0 (2021-2023)

The Telecommunications Standards Development Society, India (TSDSI) has released its Standardization Roadmap 2.0 for the period of 2021-2023 to identify technology topics that are strategically important for carrying out technical studies or developing standards. The roadmap identified 16 topics which have been arranged in 9 clusters. These clusters are indicative of a broad area of technology under which number of topics are covered. The topics are aligned with the expected future course of technological development as may be noted from the titles of the clusters like Security, 6G/5G Enhancements, AI/ML, Cloud, Spectrum Studies etc. Some of the topics have already matured to a stage of having been introduced in TSDSI for further work and others are expected to follow in due course.



Source: TSDSI

Topics covered in the roadmap are in addition to the ongoing work in the Study Groups or any other item introduced in the Study Groups for development of standards. Roadmap is a dynamic document as the needs for standardization in different areas will continue to emerge and TSDSI will remain responsive to India specific standardization needs. For more information please click here>>

c. Technical Activities

Technical activities of TSDSI are conducted in two Study groups, namely, Study Group-Networks and Study Group-Services & Solution.

I. **Study Group (SG)-Networks:** SG-Networks is responsible for standardization activities for the following:
   a) Wireless communication systems including Radio-based access and Mobile core networks, the functional elements constituting these networks and the interfaces between these networks.
   b) Overall system architecture as well as the protocol interface between various user equipment or customer premises equipment and the elements in the access network e.g., base stations, relay stations, etc.
   c) Software defined networking (SDN) aspects and Network function virtualization (NFV) of the access and core networks.
   d) Backhaul using wireless & wireline, microwave, optical and/or packet-based transport networks and related SDN & NFV aspects, systems, equipments, optical fiber cables, along

with the related control plane, network management, performance monitoring & reporting, synchronization, interfaces, multi-layer optimization techniques and testing aspects.

e) Spectrum studies related to the above areas, and technical recommendations.
f) Interference studies including co-channel, adjacent channel, and inter-system interference.

SG-Networks works closely with SG-Services & Solutions for service-level requirements. **For more information about SGN please** click here

II. **Study Group-Services & Solution: SG-Services & Solutions** is responsible for standardization activities for the following:
   a) Definition of requirements for telecom industry and related services and applications, including:
      - Service level requirements and features for various domains and applications (e.g., IoT/M2M, Automotive, Public safety, Health).
   b) Development of end-to-end service capabilities and architecture, based on the requirements, including:
      - Technical specifications for application layer functional elements and interfaces.
      - System aspects such as QoS, interoperability, etc.
      - Data management aspects such as schemas, analytics, provisioning, etc.
      - Localization components in services and systems e.g., Indian languages.
   c) Security and Privacy aspects in the end-to-end telecom networks. It includes.
      - Determining the security and privacy requirements for telecom networks including the mobile cellular and fixed-line networks across user equipments, access network, transport network, core network and service layer security aspects.
      - Specifying the related security architectures and protocols.
   d) Energy performance for telecommunication networks including access, user equipment, aggregation, core including the underlying transport systems, including:
      - Setting the energy performance related requirements across the end-to-end network
      - Benchmarking network energy performance
      - Energy optimization for networks
      - Energy performance testing
   e) Recommendations of test requirements and evaluation methodologies for any service level conformance testing activities.

SG-Services & Solutions works closely with SG-Networks for those aspects that are related to security in access network, core networks or wireless/wireline based backhaul networks. For more information please click here

Standards formulation:

All technical activities are conducted in specific Study Groups (SGs). These groups may have dedicated work groups (WGs) to work on identified study and/or standardization items. A member organization can subscribe to any technical group (SG or its WG) and participate in its proceedings.

1. **Formulation of draft standards:** The formulation process for a new Standard shall be as under:

   a. A Member of the Society may identify a Telecom / Digital communication issue in need of Standardisation. Alternatively, DoT may ask TSDSI to take up Standardisation of an issue of National interest.

b. For a new issue to be taken up, it is necessary that a number of members commit to support the work.
c. The Member shall submit the suggested research item to the Governing Council which shall allocate it to the relevant SG.
d. The SG shall approve the issue as a Study Item and allocate it to the relevant WG.
e. The WG will work to formulate a new Standard, in consultation with all interested members. It will develop text for the draft Standard taking all relevant inputs into account and consulting other relevant parts of the Society.
f. The issues will be addressed through technical studies in a particular area of Telecom / Digital communication Standardisation and are driven by contributions. An issue will normally be terminated once the defined work has been completed, or the task is revised in the light of developments, which can be technical, market-oriented, network or service driven.
g. The finalised draft Standard, on the basis of a series of deliberations and resolution of issues, will be submitted to WG/SG meeting for approval.

2. **Approval of Standards:** After a draft Standard is considered to be mature, and is consented by WG/SG, it shall be sent for approval as under:
   a) The draft Standard shall be circulated electronically to all the members who may send their comments, if necessary.
   b) If no comments, other than editorial changes, are received, the draft is considered as approved after the editorial changes are duly made.
   c) If substantive comments are received, all these comments shall be further discussed in WG/SG meetings.
   d) The process of seeking comments and discussions shall be repeated to resolve all the unsettled issues. After completion of this process, the draft shall be finalised for submission for approval to the General Body.
   e) After approval by the General Body, the proposed Standard shall be sent to DoT for approval and adoption as National Standard.

All Study Groups and their constituent Work Group(s) have a Chair and a Vice Chair each, elected in their individual capacities by the members to moderate/conduct the activities of the group following the principles of openness, transparency, fairness, consensus, and due process.

For more information about TSDSI Rules, Procedures, SOPs and Policies, please click here>>

Adoption of Standards:

TSDSI enters into agreements with other standards bodies whereby TSDSI gets the right to convert the latter's specifications into its own specifications. Such adoption agreements contain conditions which apply to the conversion. Typically, the copyright is retained by the owner organization. Patent policy of the owner organization applies for the patents contained in the adopted standards.

Conversion of the specifications into TSDSI standards is done through the process of transposition which involves, inter-alia, putting TSDSI numbers for each specification, incorporating appropriate disclaimers, statements on copyrights and patent policy etc.

Details of the patent policy and the declared patents are required to be obtained from the concerned standards body if the same are not available on their respective website. For more information, please click here>>

d. International Collaborations

TSDSI Alliances:

1. **Organizational Partner of 3GPP:** TSDSI has been a full Organizational Partner in 3GPP since January 2015, joining six other national and regional SDOs and taking their IPR into the global arena. This also enables them to contribute to the development of upcoming standards such as 5G and beyond.
   - ✓ In March 2023, TEC has initiated the process of adoption of TSDSI transposed standards corresponding to the new and updated specifications of 3GPP Release 15, 16 and 17 (total 2579 documents) as National Standards.
   - ✓ TSDSI's 5Gi standard has also been formally merged with the 3GPP 5G Standard and implemented into the 3GPP Rel-17 NR specifications.
2. **Partner Type1 of oneM2M**: TSDSI is Partner Type I of oneM2M, one of the leading forums driving M2M service layer standards. This entitles TSDSI member organizations to become Individual Members of oneM2M and contribute to standards development in M2M space. A few TSDSI members have already developed prototype oneM2M framework compliant platforms and are actively engaged in contributing to further refinement of the oneM2M framework.
   - ✓ TSDSI transposed oneM2M release 2 and release 3 have been adopted as National standards in September 2020 and August 2022 respectively.
3. **Member of Global Standards Collaboration (GSC):** TSDSI is a constituent SDO of Global Standards Collaboration (GSC) – a voluntary forum of the world's leading information and communication technologies standards organizations (SDOs). This forum meets once a year to deliberate upon strategic topics around ICT based standardization that has a global impact.

TSDSI partnerships: TSDSI's charter includes contribution to global telecommunications standardization process by facilitating representation of Indian requirements in international SDOs and to act as a catalyst for adoption of indigenously developed IP in global Standards.

1. **Cooperation Agreement:**
   - ✓ European Telecommunications Standards Institute (ETSI)
   - ✓ Open Connectivity Foundation (OCF)

2. **MoUs:**
   - ✓ 5G Infrastructure Association (5G IA)
   - ✓ Advanced Television Systems Committee (ATSC)
   - ✓ Global Certification Forum (GCF)
   - ✓ The Institute of Electrical and Electronics Engineers Standards Association (IEEE-SA)
   - ✓ Taiwan Association of Information and Communication Standards (TAICS)
   - ✓ Telecommunications Industry Association (TIA), US
   - ✓ Telecommunications Technology Association (TTA), Korea
     Wireless World Research Forum (WWRF)

3. **Letter of Intent to Co-operate:**
   - ✓ Association of Radio Industries and Businesses (ARIB), Japan

- ✓ Alliance for Telecommunications Industry Solutions (ATIS), US
- ✓ China Communications Standards Association (CCSA)
- ✓ Telecommunications Technology Committee (TTC), Japan

TSDSI at ITU:

- TSDSI is a member of ITU-T SG15 (Networks, Technologies and Infrastructures for Transport, Access, and Home).
- TSDSI is working with ITU-R SG5 (Terrestrial Communications) to participate actively in IMT2020 activities.
- TSDSI has successfully introduced an indigenous developed 5G candidate standard at the International Telecommunications Union (ITU) WP-5D Meeting in Geneva held during December 10-13, 2019.

TSDSI's 5Gi standard has been formally merged with the 3GPP 5G Standard and implemented into the 3GPP Rel-17 NR specifications in RAN#95e meeting in March 2022. 3GPP RAN approved two Rel-17 Change Requests (CRs) that enables Pi/2-BPSK waveform with filtering to be implemented in the 5G Networks. This indigenously developed technology enables the deployment of 5G cell sites with long range – an important requirement for improving cellular and IoT connectivity in rural India.

Adoption of this technology in the 5G standards will enable India to leap forward in the 5G space, with key innovations introduced by Indian entities accepted as part of global wireless standards for the first time. The nation stands to gain enormously both in achieving the required 5G penetration in rural and urban areas as well as in nurturing the nascent Indian R&D ecosystem to make a global impact.

For more information on TSDSI's a) Rules & Regulation click here *b) Working Procedures click* here *c) IPR Policy click* here *d) Guidelines click* here *e) published standards click here*

3.4 Automotive Research Association of India (ARAI)

a. Overview

Automotive Research Association of India (ARAI), established in 1966, is the leading automotive R&D organization of the country set up by the Automotive Industry with the Government of India. ARAI is an autonomous body affiliated to the Ministry of Heavy Industries, Government of India. The Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India, has recognized ARAI as a Scientific and Industrial Research Organisation (SIRO). Further, ARAI is one of the prime Testing and Certification Agency notified by Government of India under Rule 126 of Central Motor Vehicle Rules, 1989.

ARAI has been playing crucial roles assuring safe, less polluting, more efficient and reliable vehicles. Working in harmony and confidence with its Members, Customers and Government it provides services and expertise in the areas of Engineering Services, Certification & Standardisation, Research & Development, Technology Development and Knowledge Initiatives. And also offers Automotive Technologies and India Specific Data Bases for automotive product development for Indian market.

ARAI has been assisting Government in formulating **automotive standards and regulations**. ARAI serves hundreds of customers in a year including Automotive OEMs; Engine, Component and Systems Suppliers; large number of SMEs; and host of Industries/ Organisations from Non-Automotive sectors too.

The state-of-the-art Laboratories of ARAI are well equipped with the most advanced facilities in the areas of Emission Evaluation, Noise Vibration and Harshness, Structural Dynamics, Powertrain Engineering, Computer-aided engineering, Vehicle Evaluation, Active & Passive Safety, Material Evaluation, Automotive Electronics, Forging & Heat treatment Research, and Calibration etc. ARAI also has a renowned Academy. E Mobility-Centre of Excellence, Environmental Research Laboratory, Virtual Calibration Centre, Futuristic Adaptive Smart Techniques (FAST) Laboratory are some of the recent additions to ARAI's comprehensive capabilities.

ARAI is certified to ISO 9001, ISO 14001, ISO 27001 and ISO 45001; and is also accredited for its testing and calibration scope as per ISO/IEC 17025 by NABL.

For more information, please click here

b. Technical Activities

ARAI offers comprehensive certification and homologation services for an entire range of automotive vehicles, systems, and components. ARAI also assists the vehicle manufacturers for export homologation activities. ARAI is establishing a comprehensive infrastructure and facilities for testing, certification, and development of the electric and hybrid vehicles. ARAI assists the Government of India in the formulation of automotive industry standards and harmonization of regulations. ARAI is also assisting Government of India in establishing vehicle Inspection and Certification centres all across the country.

Testing and Certification:

ARAI is responsible for testing and certifying vehicles, engines, and automotive components to ensure their compliance with the Indian regulatory standards. It conducts various tests, including emission testing, crash testing, noise testing, and performance evaluation. ARAI is recognised by the international certification authorities of Singapore, Netherlands and Australia for carrying out tests as per their standards and regulations. ARAI is also establishing a comprehensive infrastructure and facilities for testing, certification and development of the electric and hybrid vehicles in its E-Mobility Centre of Excellence.

Standardization:

ARAI contributes to the development of automotive industry standards in India. It actively participates in the formulation and revision of national and international standards related to vehicle safety, emissions, and other relevant areas.

Automotive Industry Standards Committee (AISC) is set up under Central Motor Vehicles Rules - Technical Standing Committee (CMVR - TSC) by Ministry of Road Transport & Highways, Dept. of Road Transport & Highways (MoRT&H, DoRT&H)) in the year 1997 to review the safety in the design, construction, operation and maintenance of motor vehicles. The composition of the AISC is as under:

- Ministry of Road Transport & Highways, Department of Road Transport & Highways (MoRT&H, DoRT&H)
- Ministry of Heavy Industries, Department of Heavy Industry (MoHI, DHI)
- Ministry of Micro, Small & Medium Enterprises (Office of the Development Commissioner, MSME)
- The Automotive Research Association of India (ARAI)
- Central Institute of Road Transport (CIRT)
- The International Centre for Automotive Technology (ICAT)
- Indian Institute of Petroleum (IIP)
- Vehicle Research and Development Establishment (VRDE)
- Society of Indian Automobile Manufacturers (SIAM)
- Tractor Manufacturers Association (TMA)
- Automotive Component Manufacturers Association of India (ACMA)
- Bureau of Indian Standards (BIS): Technical Committee "Transport Engineering Division Council (TEDC)" for Standardization in the field of transport engineering

ARAI has published over 290 Automotive Industry Standards. The List of Standards published by the AISC can be accessed at link

India has also signed the 1998 agreement, under which, the country is committed to participate in formulation of Global Technical Regulations. It is important that views of Indian auto industry as well as test agencies are transmitted with authenticated data to the respective groups under which the discussions take place. To achieve this objective, six mirror groups are formulated in India, which work on various standards under the subject. The 6 GR groups (subsidiary technical bodies of WP.29) are:

- GRPE (India): Working Party on Pollution and Energy
- GRSG (India): Working Party on General Safety Provisions
- GRRF (India): Working Party on Brakes and Running Gear
- GRE (India): Working Party on Lighting and Light-Signalling
- GRB (India): Working Party on Noise
- GRSP (India): Working Party on Passive Safety

The Indian working groups consist of experts from the industry, test agencies and other organizations and deliberate on various subjects / regulations falling within their purview and submit their recommendations to the national secretariat for further actions.

5. Other Standards Developing Organizations (SDOs)

In India, there are many other industries and professional bodies which formulate sector specific standards, which may be referred as Standards Developing Organizations (SDOs). The statutory provisions given under Section 10 (2) (c) of the BIS Act 2016 and Section 30 of the BIS Rules, 2018 confer upon BIS, powers to recognize any Standards Developing Organization in India for development of standards.

Indian voluntary Standards development organizations	
Organization	**Standard Published**

Bureau of Energy Efficiency (BEE)	Government of India set up "Bureau of Energy Efficiency (BEE)" under the provisions of the Energy Conservation Act, 2001 with the primary objective of reducing energy intensity of the Indian economy. The Standards and Labeling Scheme (S&L) is one of the major thrust areas of BEE. The scheme was launched in May 2006, with the objective of giving the consumer an informed choice about the energy saving and thereby cost saving potential of the relevant marketed product, The scheme provides for display of energy performance labels on high-energy end-use equipment & appliances and lays down minimum energy performance standards.
Central Pollution Control Board (CPCB): Ministry of Environment, Forest and Climate Change	CPCB serves as a field formation and also provides technical services to the Ministry of Environment and Forests of the provisions of the Environment (Protection) Act, 1986. It lays down standards for air quality, water quality criteria from different sources, emission norms for vehicles, emission norms & sound levels for diesel engines & generator sets. CPCB also prepares manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks, and ducts. For more information related to standards and guidelines please visit at https://cpcb.nic.in/
Export Inspection Council of India (EIC)- Ministry of Commerce	EIC itself does not formulate any standard and instead recognizes the technical regulations or national standards of the importing countries /international standards provided that such specifications are not below the minimum standard specification prescribed in the order/notification issued by Govt. of India for the product.
Quality Council of India (QCI)	NABH – Standards for Hospital Accreditation NABET – Standard for School Accreditation
Standardization Testing and Quality Certification (STQC) Directorate – Ministry of Electronics and Information Technology (MEITY)	E-Gov Standards on the following subjects: 1. Network and Information Security 2. Metadata and Data Standards for Application Domains 3. Quality and Documentation 4. Localization and Language Technology Standards 5. Technical Standards and E-Governance Architecture 6. Legal enablement of ICT systems
Central Electricity Authority (CEA) - Ministry of Power	The functions and duties of CEA are delineated under Section 73 of the Electricity Act, 2003. Besides, CEA has to discharge various other functions as well under Section 3 (National Electricity Policy & Plan), Section 8 (Hydro Electric Generation), Section 34 (Grid Standards), Section 53 (Provision relating to Safety and

	Electric Supply), Section 55 (Use of Meters) and Section 177 (Making of Regulations) of the Electricity Act, 2003. - specify the technical standards for construction of electrical plants, electric lines and connectivity to the grid; - specify the Grid Standards for operation and maintenance of transmission lines; For further information relating to regulations and standards, please click at https://cea.nic.in/?lang=en
Central Electricity Regulatory Commission	As entrusted by the Electricity Act, 2003 the Commission has the responsibility to discharge the following functions (standards related): • to specify Grid Code having regard to Grid Standards • to specify and enforce the standards with respect to quality, continuity and reliability of service by licensees https://cercind.gov.in/index.html
Department of Fertilizers - Ministry of Chemicals and Fertilizers	The department focuses on various aspects of the fertilizer industry including production, pricing, subsidies and import/export. It also works in collaboration with relevant agencies and standards bodies to develop and update standards. https://www.fert.nic.in/home-page
Ministry of Road Transport and Highways (MoRTH)	Evolves standard specifications for roads and bridges in the country.
Indian Roads Congress (IRC)	More than 100 Standards on 1. Standards relating to roads, viz. survey, investigation, equipment, design, construction, environment, maintenance, geometrics, safety, road signage & technology. 2. Standards, Specification and Codes of Practice on Bridges and also Guidelines for their inspection, maintenance, testing and rating. 3. Standards Plans and specifications of Ministry of Road Transport & Highways
National Medicinal Plants Board- Ministry of Ayush	Voluntary standards for medicinal plants based on good agricultural/collection practices.
Central Drugs Standard Control Organization (CDSCO)- Ministry of Health and Family Welfare	Lay down the standards for Drugs and health care devices / technologies, approve new drugs under the Drugs and Cosmetics Act.
Oil Industry Safety Directorate (OISD)- Ministry of Petroleum and Natural Gas	Product design, safety standards, Codes of practices, Guidance standards in Oil and Gas sector; 120+ Standards published. https://www.oisd.gov.in/
Petroleum and Explosives Safety Organization (PESO) (Ministry of Commerce and Industry)	PESO is engaged in the activities related to safety in manufacture, possession, use, sale, import, export and handling of explosives, petroleum, flammable and non-flammable compressed gases and other hazardous substances

	through comprehensive administration of the rules framed under the Explosives Act, 1984 and Petroleum Act 1934. https://peso.gov.in/web/
Petroleum and natural Gas Regulatory Body (PNGRB): Ministry of Petroleum and Natural Gas	Lay down the technical standards and specifications including safety standards in activities related to petroleum, petroleum products and natural gas. https://pngrb.gov.in/eng-web/
Directorate of Marketing and Inspection (DMI)- AGMARK	Grading Standards covering 164 commodities in the following categories Pulses, Cereals, Essential Oils, Makhana, Vegetable Oils, Fruits & Vegetables Roasted Bengal Gram, and Vermicelli, Macaroni & Spaghetti
Food Safety and Standards Authority of India (FSSAI), (Ministry of Health and Family Welfare)	FSSAI has been established under the Food Safety and Standards Act, 2006 as a statutory body for laying down science-based standards for articles of food and regulating manufacturing, processing, distribution, sale and import of food so as to ensure safe and wholesome food for human consumption. General standards that apply to all foods as well as over 300 product standards are available on FSSAI website and constantly being revised/amended. https://fssai.gov.in/index.php?page=standards.php
Agricultural and Processed Food Products Export Development Authority (APEDA)	Standards for organic production and Systems (under the National programme for Organic Production - NPOP
Marine Products Export Development Authority (MPEDA)	Carry out inspection of marine products, its raw materials, fixing standards and specifications, regulate and take all necessary steps for maintaining the quality of sea food that are marketed overseas.
Dedicated Standards bodies	
Organization	**Standard Published**
Directorate of Standardization (DoS)- Ministry of Defence	Standards for Defence purchases and codification of defence inventories
Inter Plant Standardization in Steel Industry (IPSS)	Standards on Consumable Stores & Equipment, Design Parameters, and Management for SAIL Steel plants
Railways Design & Standards Organization (RDSO)	Development of standards for materials and products specially needed by Indian Railways

Source: Indian Standards Portal

For more information about organizations/departments of Government of India formulating Standards & Technical Regulations and their area of activity, please click here

6. Other key actors influencing standards development in India

In addition to the Bureau of Indian Standards (BIS) and other Standards Development Bodies (SDOs) as described above, there are several other key actors that influence standards development in the country. These actors include:

1. **Government Agencies:** Government agencies play a role in standards development. These include the Ministry of Electronics and Information Technology (MEITY), Ministry of Power (MoP), Ministry of New and Renewable Energy, Ministry of Environment, Forest and Climate Change (MoEF&CC), and Ministry of Commerce and Industry (MCI), Ministry of Housing and Urban Affairs (MOHUA), Ministry of Road and Transport Highways (MoRTH) among others. These agencies ensure that standards are aligned with their respective sectors and regulatory requirements.

2. **Industry Associations:** Various industry associations in India actively participate in the standards development process. These associations represent specific sectors, such as the Confederation of Indian Industry (CII), Federation of Indian Chambers of Commerce and Industry (FICCI), Associated Chambers of Commerce and Industry of India (ASSOCHAM), Manufacturers` Association for Information Technology (MAIT), EBG federation, Cellular Operators Association of India (COAI), Data Security Council of India (DSCI), Global ICT Standardization Forum for India (GISFI), Broadband India Forum (BIF), IET India and The Energy and Resources Institute (TERI) etc. They provide inputs, expertise, and recommendations to influence the development of standards that are relevant to their respective industries.

   - **Confederation of Indian Industry (CII):** CII works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes. For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

     Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few. CII, with the Theme for 2023-24 as 'Towards a Competitive and Sustainable India@100: Growth, Inclusiveness, Globalisation, Building Trust' has prioritized 6 action themes that will catalyze the journey of the country towards the vision of India@100. For more information please click here>>

   - **Federation of Indian Chambers of Commerce and Industry (FICCI):** FICCI, a non-government, not-for-profit organisation, is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry.

     Key sectors include:

- Intellectual Property Rights (IPR)
- AI and Digital Transformation
- IT and IT enabled services
- Environment and Climate Change
- Plastic Waste Management
- Clean Energy etc.

It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 2,50,000 companies. FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community. For more information please click here>>

- **Associated Chambers of Commerce and Industry of India (ASSOCHAM):** It is the country's oldest apex chamber. It brings in actionable insights to strengthen the Indian ecosystem, leveraging its network of more than 4,50,000 members, of which MSMEs represent a large segment. With a strong presence in states, and key cities globally, ASSOCHAM also has more than 400 associations, federations and regional chambers in its fold.

  Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. The Chamber is an agile and forward-looking institution, leading various initiatives to enhance the global competitiveness of the Indian industry, while strengthening the domestic ecosystem.

  ASSOCHAM is driving four strategic priorities - Sustainability, Empowerment, Entrepreneurship and Digitisation. The Chamber believes that affirmative action in these areas would help drive an inclusive and sustainable socio-economic growth for the country.

  ASSOCHAM is working hand in hand with the government, regulators and national and international think tanks to contribute to the policy making process and share vital feedback on implementation of decisions of far-reaching consequences. In line with its focus on being future-ready, the Chamber is building a strong network of knowledge architects. Thus, ASSOCHAM is all set to redefine the dynamics of growth and development in the technology-driven 'Knowledge-Based Economy. The Chamber aims to empower stakeholders in the Indian economy by inculcating knowledge that will be the catalyst of growth in the dynamic global environment. For more information please click here>>

- **Manufacturers` Association for Information Technology (MAIT)**: Set up in 1982 for purposes of scientific, educational and IT Industry promotion, **MAIT** has emerged as an effective, influential, and dynamic organization in these 30 years. Representing Hardware, Training, R&D & Hardware Design and other associated service segments of the Indian IT Industry, **MAIT's** charter is to develop a globally competitive Indian IT Industry, promote the usage of IT in India, strengthen the role of IT in national economic development, promote business through international alliances, promote quality consciousness in the IT Industry and transform the Indian IT Industry into a World Scale Industry leading to a World Class Usage and thus a World Size Market.

MAIT is represented on all concerned Government of India forums and works in close association with the Ministry of Electronics & IT (MEITY), Department of Telecom (DoT), Ministry of Communications & IT, Ministry of Commerce & Industry, Ministry of Environment & Forests, Directorate General of Foreign Trade (DGFT) under Ministry of Commerce and Industry, Directorate General of Supplies and Disposals (DGS&D) under Ministry of Commerce and Industry, Department of Industrial Policy and Promotion (DIPP), Ministry of MSME, Ministry of Finance, Planning Commission, UIDAI, BEE, BIS, NPC, CPCB, ESC, NIC, STQC, CII, FICCI, ASSOCHAM, etc. for the advancement of the IT Industry in India. For more information about MAIT please click here

- **EBG Federation:** The EBG federation was registered on 11th March, 2015 as a section 8 company under the Companies Act 2013. It is a not-for-profit company striving to offer support and collective representation to the European businesses in India. The EBG federation was established in the year 1997 as the European Business Group (EBG) by the joint efforts of the European Commission and the European Business community in India. Since then, EBG has come a long way to be recognised by the Government of India and the European commission as the industry advocacy group representing interests of the European companies in India. EBG Federation is supported by the Delegation of the European Union to India and represents the 27 Member States of the European Union, United Kingdom as well as accession countries and its partners in European Economic Area (EEA). The EU Ambassador is the Patron of the EBG Federation. Currently, EBG has Chapters in Delhi, Mumbai, Bangalore and Chennai with approx. 170 companies as members.

  The primary objective of EBG is to actively support the growth in Indo-European trade relations, become the most relevant advocate for European businesses in India and ensure that the needs of the European businesses are well presented to policy and decision makers.

  The focus areas of EBG are as follows:

  - To become a platform of support and representation for the European businesses in India.
  - Act as a forum for European corporates and entities to voice their values and needs to the Government and the larger business community in India through interactive meeting with Indian industry, and others in the areas of business and culture to facilitate greater understanding, dialogue and cooperation between all stakeholders.
  - Bring out, annually, high level Position Paper (PP) with a sectoral focus on key segments of operational business and bring this PP to the notice of the Indian Government, the European Commission, diplomatic missions of the European countries in India, Corporate bodies, Chambers of Commerce and Industry and other key stakeholders.
  - Provide a platform for individual sector committees in various sectors (Alcoholic Beverages, Automotive, Aviation, Banking & Financial Services, Chemicals & Petrochemicals, Defence, Energy (Oil & Gas and Power), Financial Services, FMCG, Healthcare, Homeland Security, ICT & Innovation, Logistics, Pharmaceuticals, Retail, Telecommunications) to actively engage with key policy changes to enable business growth in each of those areas.

- Support the European SME Forum. EBG's SME Forum has now been launched and in the process of being set up.

EBG is also an active member of the European Business Organization's worldwide network.

EBG's aim is to promote the growth and development of European Business Group activities in India and be the umbrella organization to represent the interests of the European businesses who have invested in or looking to invest in India. For more information please click here>>

- **Cellular Operators Association of India (COAI):** Over the years COAI has emerged as the official voice for the Indian telecom industry and interacts directly with Ministries, Policy Makers, Regulators, Financial Institutions and Technical Bodies. It provides a forum for discussion and exchange of ideas between these bodies and the Service Providers, who share a common interest in the development of mobile telephony in the country. COAI collaborates with other Industry Associations such as CII, FICCI, ASSOCHAM, AUSPI, ISPAI, VSAT association etc., with the objective of presenting an industry consensus view to the Government on crucial issues relating to the growth and development of the Indian telecom Industry. COAI also interacts with various international organizations such as ITU, GSMA, UMTS, TIA, ITIC, GSA, MMF, Digital Europe, WWRF and 3GPP etc.; Country Embassies as well as the Press & Media to ensure that the issues pertaining to the mobile phone industry are discussed, understood and debated on a wider platform. For more information, please click here>>

- **Data Security Council of India (DSCI):** DSCI, is a not-for-profit, industry body on data protection in India, setup by NASSCOM, committed to making the cyberspace safe, secure and trusted by establishing best practices, standards and initiatives in cyber security and privacy. To further its objectives, DSCI engages with governments and their agencies, regulators, industry sectors, industry associations and think tanks for policy advocacy, thought leadership, capacity building and outreach activities. For more information please click here

- **Global ICT Standardization Forum for India (GISFI)**: GISFI is an Indian standardization body active around Information and Communication Technologies (ICT) and related application areas, such as energy, telemedicine, wireless robotics, biotechnology. GISFI addresses the research and product development of ICT in India and provides a bridge towards the globalization of the Indian achievements; the issues of technology, governance, and development; and a platform for raising an awareness of the importance and the internationalization of the higher education in the field are supported by the partnership with the Government of India. The working groups organized in GISFI draw knowledge from academia, business, civil society, and Government/policy-making circles. For more information please click here>>

- **Broadband India Forum (BIF):** BIF functions as an independent policy forum and think-tank that works for the development & enhancement of the entire broadband ecosystem in a holistic, technology-neutral, and service-neutral manner. BIF's endeavour is to promote, support and enhance all policy, regulatory & standards initiatives for the proliferation of high-quality broadband in the country to empower consumers with efficient and

economical broadband to realize the true Digital India. BIF works closely with the Government and the Regulator in this mission and is dedicated forum with participation from all stakeholders, including Technology Providers, Telecom Operators, Internet Service Providers, Value-Added Service Providers, Satellite Operators and service providers, MSOs, Start-ups, and professional entities, as well as seasoned Industry professionals who are familiar with different technologies, operations, regulations, and policies. For more information about BIF, please click here>>

- **The Institution of Engineering and Technology (IET) India:** The IET office started operations in India in 2006, in Bangalore with vision to become the most relevant and therefore the most preferred institution for engineering and technology professionals in India. IET India strategy is to be a key influencer in academia, industry and government in order to impact standards, innovation and policy to help create a future-ready engineering workforce and solve societal challenges of national importance. The technologies that IET India has chosen to focus on are:
  - The Internet of Things (IoT)
  - Future of Mobility and Transport

  For more information about IET India, please click here>>

- **The Energy and Resources Institute (TERI):** TERI is an independent, multi-dimensional organization, with capabilities in research, policy, consultancy and implementation. TERI's mission is to usher transitions to a cleaner and sustainable future through the conservation and efficient use of energy and other resources, and innovative ways of minimizing and reusing waste.

  TERI pursues its mission by working towards the following key goals:
  - Enhancing access to clean energy for all
  - Helping a global transition to renewable energy pathways
  - Enhance energy efficiency, especially in industries, public utilities and buildings
  - Facilitating more efficient use of materials, especially iron and cement
  - Enhancing conservation, utilization of and access to water, including watershed management
  - Enabling the planning and governance of environmentally sustainable cities through green buildings and through management of solid waste, sewage, sanitation, mobility and air quality
  - Building resilience to adverse impacts of climate change due to cyclones and variations in hydrology and temperature
  - Accelerating pollution abatement through innovative policies and environment treatment products
  - Enhancing ecosystem services, especially in forestry and biodiversity
  - Developing green mobility solutions
  - Enabling sustainable food production and nutritional security through quality planting material, bio-based agricultural inputs and crop diversification
  - Developing innovative solutions for clean air, regionally and in cities

For more information about TERI please click here>>

3. **Research Institutions and Academia:** Academic institutions and research organizations in India also contribute to standards development. They conduct research, provide technical expertise, and participate in standardization activities. Institutions like the Indian Institutes of Technology (IITs), Indian Institute of Science (IISc), DST, C-DOT, CEWiT, C-DAC, Council of Scientific and Industrial Research (CSIR) and National Laboratories etc. play a crucial role in shaping standards in their respective domains.

a) Department of Science and Technology (DST)

Department of Science & Technology (DST) was established in May 1971, with the objective of promoting new areas of Science & Technology and to play the role of a nodal department for organizing, coordinating and promoting S&T activities in the country. It gives funds to various approved scientific projects in India. It also supports various researchers in India to attend conferences abroad and to go for experimental works. For more information, please click here>>

b) Centre for Development of Telematics (C-DOT)

The Centre for Development of Telematics (C-DOT) is the Telecom Technology Development Centre of the Government of India. It was established in August 1984 as an autonomous body. It was vested with full authority and total flexibility to develop state-of-the-art telecommunication technology to meet the needs of the Indian telecommunication network.

C-DoT over the years, has evolved into a full-fledged telecom R&D institution, that complies with level -5 maturity on CMMI model, and has capabilities to undertake large scale state of the art telecom technologies development programs. C-DoT as a torch bearer of indigenous telecom R&D continues to develop latest technology products in areas like Optical, Switching, Wireless, Security and Network Management while also working on futuristic technologies like M2M/IoT, 5G, AI etc. For more information on CDOT Solutions, Products and Services please click here

c) Center of Excellence in Wireless and Information Technology (CEWiT)

The Centre of Excellence in Wireless Technology (CEWiT) is an autonomous research Society of IIT Madras set up by Ministry of Communications and IT in partnership with the Indian telecom industry. CEWiT's vision is to provide technological leadership to the Indian wireless industry and address the needs of the Indian market through advanced R&D and value creation. CEWiT works as a neutral partner to industry stakeholders and policy makers on various technological aspects of the wireless communication industry. The Centre has several experts in the Radio access technologies, specifically focusing on 4G and 4G-Advanced technologies like LTE and WiMAX. CEWiT also provides technical leadership to the Broadband Wireless Consortium of India. For more information on CEWiT please click here

d) Centre for Development of Advanced Computing (C-DAT)

Centre for Development of Advanced Computing (C-DAC) is the premier R&D organization of the Ministry of Electronics and Information Technology (MeitY) for carrying out R&D in IT, Electronics and associated areas. At present, most of the R&D activities fall into following categories.

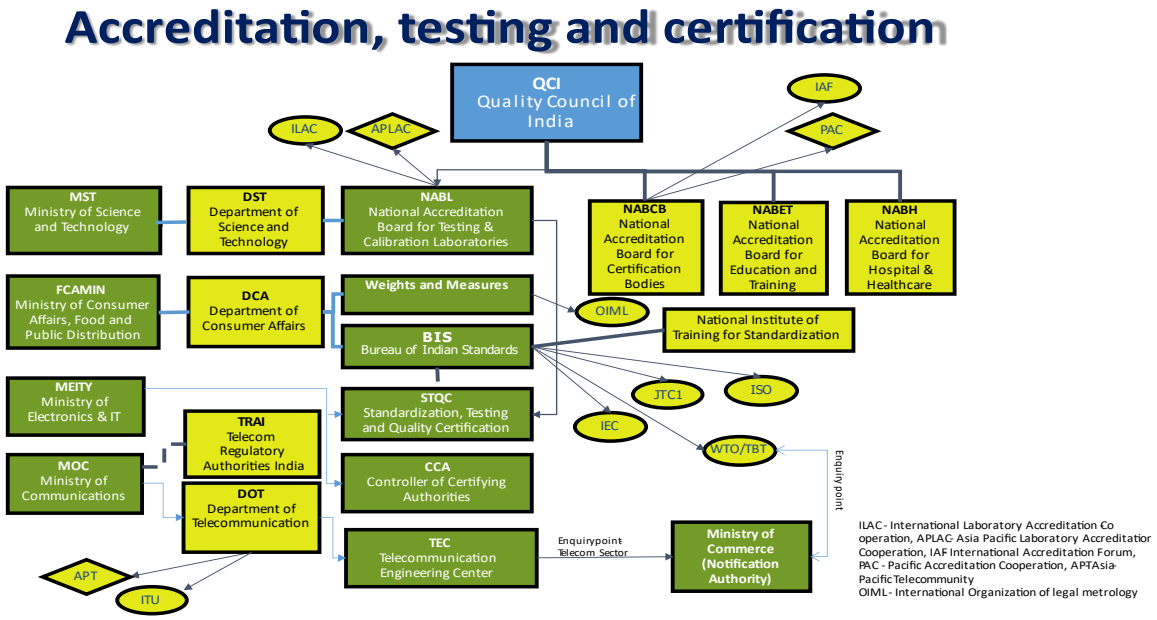
- High Performance Computing
- Multi-lingual Computing
- Professional Electronics
- Information and Cyber Security
- Health Informatics
- Software Technologies

For more information please click here>>

It is important to note that while these actors influence standards development in India, the BIS remains the primary authority responsible for the formulation and implementation of national standards.

7. Accreditation, Testing & Certification Bodies in India

In India, unlike Europe, there is very little, if any, market-surveillance, almost no product liability court cases and it is common to find non-conformant inferior quality products. Official sanctions are minimal and very time consuming and so most consumers do not even report non-conformance. This has resulted in consumers and entities relying on (company) branded products which guarantee quality and/or government approved certifications and logos such as ISI Mark, Gold hallmarking which provide the necessary trust. The only entities which do have power to impose sanctions, confiscate products, etc. are the Indian export councils which provide the guarantees. Thus, it is common to see local products being promoted as “Export Quality” since products for exports from India are monitored and certified by the certification bodies.



Quality Council of India (QCI):

Quality Council of India (QCI) was set up as a non-profit autonomous society registered under Societies Registration Act XXI of 1860 to establish an accreditation structure in the country. QCI is governed by a Council comprising of 38 members and has an equal representation of Government, Industry and other Stakeholders. The Council is the apex level body responsible for formulating the strategy, general policy, constitution and monitoring of various components of QCI including the accreditation boards with objective to ensure transparent and credible accreditation system.

Main functions of QCI are:

i. To develop, establish & operate National Accreditation programmes for various service sectors such as education, healthcare, environment protection, governance, social sectors, infrastructure sector, vocational training etc., in accordance with the relevant international standards & guides for the conformity assessment bodies certifying products, personnel, management systems, carrying out inspection and for the laboratories undertaking testing & calibration and such other areas of organized activities that have significant bearing in improving the quality of life and well-being of the citizens of India.
ii. To develop accreditation standards to support accreditation programs where such standards are not available at the national/international level.

QCI has four Accreditation Boards involved in accreditation programmes. Each board is functionally independent and works within their core area of expertise.

1. **National Accreditation Board for Certification Bodies (NABCB):** NABCB provides accreditation to Certification and Inspection Bodies based on assessment of their competence as per the Board's criteria and in accordance with International Standards and Guidelines. NABCB is internationally recognized and represents the interests of the Indian industry at international forums through

membership and active participation with the objective of becoming a signatory to international Multilateral / Mutual Recognition Arrangements (MLA / MRA). NABCB is a member of International Accreditation Forum (IAF) and Pacific Accreditation Cooperation (PAC) as well as signatory to its Multilateral Arrangements (MLA)s for QMS, EMS, FSMS & Product certification.

NABCB is also a Full member of International Laboratory Accreditation Cooperation (ILAC) & Asia Pacific Laboratory Accreditation Cooperation (APLAC) as well as signatory to its Mutual Recognition Arrangements (MRA)s for inspection.

2. **National Accreditation Board for testing & calibration Laboratories (NABL)**: NABL is an accreditation body, with its accreditation system established in accordance with ISO/ IEC 17011. "Conformity Assessment –Requirements for Accreditation bodies accrediting conformity assessment bodies." NABL provides voluntary accreditation services to:
   - Testing laboratories in accordance with ISO/ IEC 17025 'General Requirements for the Competence of Testing and Calibration Laboratories'
   - Calibration laboratories in accordance with ISO/ IEC 17025 'General Requirements for the Competence of Testing and Calibration Laboratories'
   - Medical testing laboratories in accordance with ISO 15189 'Medical laboratories - Requirements for quality and competence'
   - Proficiency Testing Providers (PTP) in accordance with ISO/IEC 17043 "Conformity assessment — General requirements for proficiency testing" and
   - Reference material producers (RMP) in accordance with ISO 17034 "General requirements for the competence of reference material producers".

   NABL, with an objective to ensure the acceptance of test/ calibration results issued by the accredited conformity assessment bodies (CAB) across the borders, maintains linkages with the international bodies-
   - International Laboratory Accreditation Co-operation (ILAC) and
   - Asia Pacific Accreditation Co-operation (APAC)

   NABL is a full member of **ILAC** and **APAC** and regularly takes part in their meetings.

   NABL is **Mutual Recognition Arrangement (MRA)** signatory to **ILAC** as well as **APAC** for the accreditation programs – Testing and Calibration (ISO/IEC 17025), Medical (ISO 15189), Proficiency Testing Providers (PTP) (ISO/IEC 17043) and Reference material producers (RMP) (ISO 17034).

   Such international arrangements/ MRA are based on peer evaluation and acceptance of other MRA Partner accreditation systems. MRA facilitate acceptance of test/ calibration results between countries which MRA partners represent. Certificate issued to NABL for **APAC/ ILAC** MRA Signatory.

3. **National Accreditation Board for Hospitals and healthcare providers (NABH):** NABH is set up to establish and operate accreditation programme for healthcare organisations on patient safety and quality of healthcare based upon national/international standards. NABH is an Institutional Member of the International Society for Quality in Health Care (ISQua), a member of the

Accreditation Council of International Society for Quality in Health Care (ISQua) and on board of Asian Society for Quality in Healthcare (ASQua).

4. **National Accreditation Board for Education & Training (NABET)**: NABET provides accreditation to schools, training course providers and auditors that meet the Board's criteria and also offers a mechanism for their international recognition.

   NABET has established MRAs with the following international agencies:
   - American National Standard Institute (ANSI), USA
   - Scottish Qualification Authority (SQA), Scotland

   This means that products from EEA area may have to go through additional certification by QCI accredited body since SDoC or certification from non-accredited entity may not be accepted, unless there is an MLA.

Bureau of Indian Standards (BIS):

BIS is the national standardization body and certification body of India and operates under the Ministry of Consumer Affairs, Food, and Public Distribution. It formulates standards and grants certification marks to products, services, and systems through its various certification schemes such as the ISI mark for products meeting specific quality standards. For more information, please click here>>

Telecom Engineering Centre (TEC):

TEC is the technical body of the Department of Telecommunications, Government of India. It carries out testing and certification of telecom products/equipments to ensure their compliance with the prescribed technical standards. The certification process involves evaluating the performance, quality, and interoperability of the equipment through various tests and assessments. TEC also recognises Foreign CABs/CBs located in the territory of MRA partner to perform testing and certification of telecom products to Indian requirements. This helps in promoting the use of reliable and compatible telecom equipment in the Indian market. For more information please click here>>

Standardization Testing and Quality Certification (STQC)

Standardisation Testing and Quality Certification (STQC) Directorate is an attached office of the Meity, India, provides quality assurance services around Electronics and IT through countrywide network of laboratories and centres. The services include **Testing**, **Calibration**, **IT & e-Governance**, **Training** and **Certification** to public and private organizations.

STQC laboratories are having National / International accreditation and recognitions around testing and calibration.

Besides testing and calibration STQC has specialized institutions such as Indian Institute of Quality Management (IIQM) for quality related training programs and Centre for Reliability (CFR) for reliability related services. In the area of IT & e-Governance, STQC provides Quality Assurance Services for

Software testing, Information Security, and IT Service Management by conducting Testing, Training, Audit and Certifications.

STQC Certification Services took lead and became the first Third Party Certification Agency of Indian origin in India in 1991 to offer QMS certification. Since then, STQC Certification Services has broaden its scope of certification and is now providing Certification Service in QMS Product Certification/ISMS/ITSM/Website quality / smart card / Biometric devices along with a host of other schemes for the benefit of the industry. It caters to the need of third-party certification for the products in line with National and International standards and schemes. STQC offers its certification services to industry and other organizations in the following domains:

- **Management System Certification Schemes**
  - ISO 9001 Quality Management System (QMS) Certification
- **Product Certification Schemes**
  - Product Safety Certification based on IEC Standards (S mark)
  - IECEE-CB Certification Based on IEC Standards
  - Agency Inspection Services
- **Mgmt. System, Product Certification (IT & e-Gov)**
  - ISO 27001 Information Security Management System (ISMS) Certification
  - ISO 20000-1 IT Service Management (ITSM) Certification
  - Website Quality Certification
  - Common Criteria Certification
  - Smart Card Testing and Certification
  - Bio-metric Devices Testing and Certification
  - Software & System Certification

STQC's international recognition has also been enhanced by virtue of its mutual recognition agreements with leading certification agencies across the world such as JQA, Japan; Kaitech, South Korea; KEMA, Netherlands, VDE, Germany etc. For more information about STQC, please click here

Controller of Certifying Authorities (CCA)

As per Section 18 of The Information Technology Act, 2000 provides the required legal sanctity to the digital signatures based on asymmetric cryptosystems. The digital signatures are now accepted at par with handwritten signatures and the electronic documents that have been digitally signed are treated at par with paper documents. The IT Act provides for the Controller of Certifying Authorities (CCA) to license and regulate the working of Certifying Authorities. The Certifying Authorities (CAs) issue digital signature certificates for electronic authentication of users.

The Controller of Certifying Authorities (CCA) has been appointed by the Central Government under section 17 of the Act for purposes of the IT Act. The Office of the CCA came into existence on November 1, 2000. It aims at promoting the growth of E-Commerce and E- Governance through the wide use of digital signatures.

The Controller of Certifying Authorities (CCA) has established the Root Certifying Authority (RCAI) of India under section 18(b) of the IT Act to digitally sign the public keys of Certifying Authorities (CA) in the country. The RCAI is operated as per the standards laid down under the Act.

The CCA certifies the public keys of CAs using its own private key, which enables users in cyberspace to verify that a given certificate is issued by a licensed CA. For this purpose, it operates, the Root Certifying Authority of India (RCAI). The CCA also maintains the Repository of Digital Certificates, which contains all the certificates issued to the CAs in the country. For more information please click here

Export Promotion Councils of India (EPC)

The Export Promotion Councils are non-profit organizations registered under the Indian Companies Act or the Societies Registration Act, as the case may be. They are supported by financial assistance from the Government of India.

The major functions of the EPCs are as follows:

- To provide commercially useful information and assistance to their members in developing and increasing their exports
- To offer professional advice to their members in areas such as technology upgradation, quality and design improvement, standards and specifications, product development and innovation etc.
- To organize visits of delegations of its members abroad to explore overseas market opportunities.
- To organize participation in trade fairs, exhibitions and buyer-seller meets in India and abroad.
- To promote interaction between the exporting community and the Government both at the Central and State levels.
- To build a statistical base and provide data on the exports and imports of the country, exports, and imports of their members, as well as other relevant international trade data.

Presently, there are fourteen Export Promotion Councils under the administrative control of the Department of Commerce and there are Eleven Export promotion councils under the Ministry of Textiles. The Councils perform both advisory and executive functions. For more information please click here>>

Export Inspection Council of India (EIC)

The Export Inspection Council (EIC) is the official export –certification body of India which ensures quality and safety of products exported from India. EIC was set up by the Government of India under Section 3 of the Export (Quality Control and Inspection) Act, 1963 to ensure sound development of export trade of India through quality control and inspection and matters connected therewith. The role of EIC is to ensure that products notified under the Export (Quality Control and Inspection) Act 1963 are meeting the requirements of the importing countries in respect of their quality and safety.

EIC is an advisory body to the Central Government, which is empowered under the Act to:

- Notify commodities which will be subject to quality control and/ or inspection prior to export,
- Establish standards of quality for such notified commodities, and
- Specify the type of quality control and / or inspection to be applied to such commodities.

Besides its advisory role, the Export Inspection Council, also exercises technical and administrative control over the five Export Inspection Agencies (EIAs), one each at Chennai, Delhi, Kochi, Kolkata, and Mumbai established by the Ministry of Commerce, Government of India, under Section 7 of the Act

for the purpose of implementing the various measures and policies formulated by the Export Inspection Council of India.

Export Inspection Council, either directly or through Export Inspection Agencies, and its field organization renders services in the areas of:

- Certification of quality of export commodities through installation of quality assurance systems (In-process Quality Control and Self Certification) in the exporting units as well as consignment wise inspection.
- Certification of quality of food items for export through installation of Food safety Management System in the food processing units.
- Issue of Certificates of origin to exporters under various preferential tariff schemes for export products.

For more information please click here

8. Foreign SDOs active in India

Indian companies and consumers are looking for trusted quality and assurances of the product. This has opened the market for ISO standards based "Quality" certification and trainings for almost anything, including establishment of foreign Standards Development Organizations (SDOs) in India. These certificates based on global standards add value to the buyer as they bring a level of trust which would not be there otherwise.

BSI Group India Pvt. Ltd. (BSI)

Since its foundation in 1901, BSI Group has grown into a leading global independent business services organization that inspires confidence and delivers assurance to customers with standards-based solutions. Originating as the world's first national standards body, BSI has a presence on every continent, with 87 offices in 31 countries across the world. Our clients range from globally recognized brands to small, local businesses. The Group's key offerings are:

- The development and sale of private, national, and international standards and supporting information.
- Second and third-party management systems assessment and certification
- Testing and certification of products and services
- Performance management software solutions
- Training services in support of standards implementation and business best practice.

BSI India is offering over 30,000 standards which are EN, BS, ISO, and PAS standards which you can now buy locally in India in, India Rupees. BSI is registered in India as Indian "for profit" company and is the most dynamic entity with HQ in New Delhi and offices in Bengaluru, Chennai, Hyderabad, Kolkata, and Mumbai.

For more information, please click here

DQS Certification India Pvt. Ltd. (DQS-AFNOR)

DQS Certification India Private Limited, a Delhi Quality Services initiative for Corporate Excellence since 1994, is an Authorized Transition Partner with SEI (Software Engineering Institute), Carnegie Mellon University (CMU), Pittsburgh, USA to provide CMMI Assessment and Training Services also known as CMMI Product Suite Services. DQS Certification India Private Limited in partnership with AFNOR Group of France (http://www.afnor.org/), the 5th largest Certification and Inspection Organization of the world, provides Management System Certification services also.

DQS Certification India Pvt Ltd prides itself in providing premium quality registration services on value for money costs through competent professionals of high calibre. The attempt is to provide personalized service with a human interface rather than making the client wrestle with faceless organizations and bulky procedural issues. With this intention, DQS Certification India Pvt Ltd, has been able to create a niche for itself in the intensely competitive scenario.

For more information, please click here

Project Management Institute (PMI-ANSI)

The Project Management Institute Standards Program was established by the PMI Executive Director with the advice and counsel of the PMI Board of Directors and was commissioned to improve the understanding and competency of experienced and new project management practitioners and customers worldwide. The role of the Standards Program is to identify, define, document, and champion generally accepted project management approaches and a common project management lexicon.

PMI was accredited by the American National Standards Institute (ANSI) as a Standards Developer under the accredited organization method on October 14, 1998 and has successfully completed periodic audits since that time.

For more information, please click here

VDE

VDE, the Association for Electrical, Electronic & Information Technologies headquartered in Frankfurt am Main, and represented in Berlin and Brussels as well as with 29 branch offices throughout Germany has a local representative in India based out of National Capital Region, Sonipat Haryana supporting the local industry on VDE testing quality and safety standards.

VDE is the only organization in the world that combines science, standardization, testing, certification, and application consulting under one umbrella.

For more information, please click here

IEEE, India

IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

IEEE and its members inspire a global community to innovate for a better tomorrow through its more than 400,000 members in over 160 countries, and its highly cited publications, conferences, technology standards, and professional and educational activities. IEEE is the trusted "voice" for engineering, computing, and technology information around the globe.

IEEE India Operations Center is headquartered in Bengaluru at the World Trade Center, located on Dr. Rajkumar Road in Rajajinagar.

IEEE India Operations Center was established in 2010 with a focus on standards, technical activities, membership development, business development, and support for digital library customers. IEEE India is developing educational programs under the umbrella of the IEEE Blended Learning Program, focused on training and skills development. IEEE India Operations Center is also responsible for the territories of India, Sri Lanka, and Bangladesh for promoting the IEEE *Xplore®* Digital Library. IEEE India's Contact Center provides support for members in India and around the world. IEEE India also has a strong public-policy focus, engaging policy makers and technology experts.

IEEE India provides support to all the geographical units, which include IEEE India Council, 12 Sections, 132 Technical Society Chapters, and 1,145 Student Branches. For more information please click here

ASTM International-India

ASTM International is one of the largest voluntary standards development organizations in the world-a trusted source for technical standards for materials, products, systems, and services. Known for their high technical quality and market relevancy, ASTM International standards have an important role in the information infrastructure that guides design, manufacturing and trade in the global economy.

ASTM International, originally known as the American Society for Testing and Materials (ASTM), was formed in 1898. Today, ASTM continues to play a leadership role in addressing the standardization needs of the global marketplace. Known for its best-in-class practices for standards development and delivery, ASTM is at the forefront in the use of innovative technology to help its members do standards development work, while also increasing the accessibility of ASTM International standards to the world

In 2009, technical advisor Mr. Jayakumar Gopalakrishnan, began serving as an ASTM International consultant in India to promote and enhance the awareness and use of ASTM International standards and related products and services relevant to the textile and personal protective equipment industries.

In August 2009, India's Central Institute of Plastics Engineering and Technology (CIPET) and ASTM International signed a letter of implementation for a training and collaboration program scheduled to take place in November 2009. Eight technical experts from several CIPET campuses attended an intensive two-week program that included training at ASTM headquarters and participation in the November committee week meetings of Committee D20 on Plastics.

ASTM International continues to welcome members from around the world, including India. ASTM also now has over 250 student members from India. For more information, please click here more

American Society of Mechanical Engineers (ASME) India Pvt. Ltd.

ASME helps the global engineering community develop solutions to real world challenges. Founded in 1880 as the American Society of Mechanical Engineers, ASME is a not-for-profit professional organization that enables collaboration, knowledge sharing and skill development across all engineering disciplines, while promoting the vital role of the engineer in society. ASME codes and standards, publications, conferences, continuing education, and professional development programs provide a foundation for advancing technical knowledge and a safer world.

ASME has four key offices in the United States, including its headquarters operation in New York, N.Y., and three international offices in Beijing, China; Brussels, Belgium, and New Delhi, India. ASME India office is in GURUGRAM (Haryana) INDIA. ASME has over 85,000 members in more than 135 countries worldwide. Read more>>

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