# STANDARDS & TECHNOLOGY ANNUAL REPORT

# STAR 2010-2011

## Setting the Standards for Emerging Technologies

TIA
ADVANCING GLOBAL COMMUNICATIONS

TIA is accredited by the American National Standards Institute (ANSI) to develop voluntary industry standards for the information and communications technology (ICT) industry.

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## ABOUT TIA

The Telecommunications Industry Association (TIA) represents the global information and communications technology (ICT) industry through standards development, advocacy, tradeshows, business opportunities, market intelligence and worldwide environmental regulatory analysis. Since 1924, TIA has been enhancing the business environment for broadband, mobile wireless, information technology, networks, cable, satellite and unified communications. Members' products and services empower communications in every industry and market, including healthcare, education, security, public safety, transportation, government, the military, the environment and entertainment.

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**Welcome to STAR – TIA's Standards and Technology Annual Report for 2010–2011.** We invite you to read about our continued progress in developing voluntary technical standards last year and our goals for this year. We urge you to join the 1,100+ volunteers serving on more than 70 committees, subcommittees, working groups, Technical Advisory Groups, and the Third Generation Partnership Project 2 (3GPP2) as part of our association's highly respected standards developing efforts.

During the course of more than 65 years, TIA has issued 3,500+ information and communications technology (ICT) industry standards and related documents. Kudos are due to the hard-working and dedicated TIA members and non-member volunteers from around the world who make this high volume of documents per year possible. Our prestigious program is enhanced by TIA's accreditation as a standards developing organization by the American National Standards Institute.

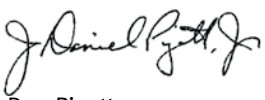
In recent years, we have expanded our standards focus to areas such as vehicular telematics, healthcare ICT, smart device communications, machine-to-machine (M2M) connections and smart utility networks. While working on these cutting edge segments, we coordinate with dozens of global standards developing organizations. Of course, we continue to work on vital technical areas such as mobile and personal private radio, point-to-point communications, multimedia access, satellite equipment and systems, user premises cabling and fiber optic cabling.

Two recent developments illustrate TIA's initiatives as elaborated in this edition of STAR:

- In the M2M arena, the Standardization Task Force created as a result of the Global Standards Collaboration meeting (GSC-15) in Beijing last year will hold its first international meeting May 18, 2011, at the TIA 2011: Inside the Network conference and exhibition in Dallas.
- TIA and the Georgia Tech Applied Research Corp. announced agreement to explore collaborative standards development opportunities involving research, testing and outreach in the area of global information and communications infrastructure. The cooperation includes defining an industry-supported center at Georgia Tech focused on the science, engineering and testing necessary to advance telecommunications standards.

Thank you for your interest in STAR and TIA's dramatically broadening standards developing efforts. And thank you to the many, many volunteers who work so hard on behalf of the ICT industry to ensure technical compatibility, interoperability and connectivity of products and services. The public benefits that stem from TIA's standards efforts are enormous for consumers and industry, alike.

Sincerely,



Dan Pigott
TIA Chairman

Grant E. Seiffert
TIA President

**Dan Pigott**
*TIA Chairman*

**Grant E. Seiffert**
*TIA President*

# TIA Membership Means Leadership. Influence. Results.

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# Letter from the TIA Technical Committee Chairman

**Charles Kenmore**
ANDA Networks
*TIA Technical Committee Chairman*

**THIS IS MY FOURTH YEAR OF SERVING YOU AS CHAIRMAN OF TIA'S TECHNICAL** Committee. It has been another extremely rewarding year and one of great admiration for the work of the Technical Engineering Committees (ECs). In 2010, these committees produced over 100 technical documents in support of ICT, in areas such as cabling and wiring, data centers, tower structures, user premises equipment, satellite, public safety, wireless communications, mobile TV, telematics and healthcare information technology. I am also pleased to announce the formation of our newest Engineering Committee for Smart Utility Networks, TR-51. This committee is focused on mesh topologies for utility devices with the aim of providing utility companies with systems that allow them to better manage the resources they provide to customers. This area is new to TIA standards but the communications protocols and tools necessary to operate the network are near and dear to us.

TIA is fully accredited by the American National Standards Institute and the more than 1,000 active TIA and TIA-produced American National standards available today are recognized and deployed worldwide. On the international front, TIA continues its involvement, participation, and active roles as secretariat of many International Groups and US Technical Advisory Groups (TAGs), in the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO). TIA administers four International Secretariats and 16 US TAGs to international committees.

TIA is also an active partner and the Secretariat, for over 10 years, to the Third Generation Partnership Project 2 (3GPP2). It terms of partnerships, TIA is also a long-standing Standards Developing Organization (SDO) in the Global Standards Collaboration (GSC), a forum comprised of SDOs from regions all over the world (Canada, China, Europe, Japan, Korea) that meet on a 12–15 month cycle in the interest and spirit of collaboration and information sharing and to foster worldwide coordination in this world of converging technologies.

As we move forward with an ongoing focus on new and emerging technologies important to the business directions and initiatives of our members, the Technical Committee formed the Emerging Technologies Subcommittee (ETSC) to explore and take "deep dives" into the relevant areas. The ETSC has been investigating areas of interest as diverse as cloud computing and data compression technologies. They have been a key launching point for some interesting new work initiatives that are being developed in the engineering committees. In addition, TIA and Georgia Tech signed a Memorandum of Understanding to further promote these new initiatives and jointly leverage our expertise in technology. We are particularly excited that one of Georgia Tech's technical experts in the area of security will be leading the recently formed Smart Device Communications Security Ad-Hoc Group.

Technology impacts just about every consumer and every industry. Technical standards are the foundation — the ICT "glue" — of our lives and lifestyles. The commitment of our members to TIA standards is strong, and I would like to extend my sincere appreciation to the many companies that volunteer their top technical engineers and professionals, and the hundreds of hours they dedicate, to the development of ICT standards.

Sincerely,
Charles Kenmore
TIA Technical Committee Chairman

# TIA, Georgia Institute of Technology Sign MOU to Develop Standardization Collaboration

James M. McGarrah

**IN FEBRUARY 2011, TIA AND THE GEORGIA INSTITUTE OF TECHNOLOGY** (Georgia Tech) Applied Research Corporation (GTARC) announced they signed a Memorandum of Understanding (MOU) to explore collaborative standards development opportunities of mutual interest involving research, testing and outreach in the area of global information and communications infrastructure. This collaboration will take place through the Georgia Tech Research Institute (GTRI), a department of Georgia Tech. A pivotal dimension of the MOU is the intent to define an industry-supported center at Georgia Tech focused on the science, engineering and testing necessary to advance telecommunications standards.

Grant Seiffert, President of TIA, says "This MOU marks an important step for TIA as the scope of our standardization activities is expanding and the related demand for standards is rapidly increasing. The collaboration with Georgia Tech will give TIA access to state-of-the-art research capabilities on top of the strong and broad experience already offered by TIA members. Combining leading hands-on industry expertise with support from a premier institution of higher learning and research will strengthen TIA's voluntary standards process throughout our engineering committees."

TIA has recently responded to the changing telecommunications environment with the creation of new standards committees such as those on Smart Device Communications and Smart Utility Networks. The MOU with Georgia Tech is one the many new avenues followed by TIA to position the association as a global, forward-looking and dynamic organization solidly anchored in the 21st century.

Dr. Jeffrey O. Smith, Chair of the TIA TR-50 Engineering Committee on Smart Device Communications and Chief Technology Officer of Numerex, which worked actively on the connection between TIA and Georgia Tech, highlighted the agreement's potential in security, an important focus of TR-50 since its creation: "Georgia Tech's involvement will be critical in the machine-to-machine (M2M) communications area. In particular, it will contribute to efficiently addressing pressing concerns in smart device standardization such as security. Led by GTRI's Information and Communications Lab (ICL), GTRI will bring unique resources in this regard, including those of GTRI's newly-created Cyber Technology and Information Security Laboratory (CTISL) and the world-renowned Georgia Tech Information Security Center (GTISC)."

However, the contemplated cooperation between Georgia Tech and TIA, which will start with M2M, is much larger, and the domains to which this collaboration could be extended are numerous both in breadth and depth.

The MOU aims at establishing mutually acceptable cooperative programmatic arrangements that will facilitate the achievement of both organizations' strategic goals. This new relationship will benefit from the experience and expertise of retired Rear Admiral James M. McGarrah, Director of the GTRI ICL. After working more than 20 years for Southern Bell and BellSouth (now AT&T), McGarrah served as executive director of national networks for Cingular Wireless from 2000 to 2003. He led a team of 150 technical directors, managers and engineers who planned, engineered, implemented, administered and operated Cingular's national service delivery network infrastructure. In this capacity, he has participated in many TIA standardization activities and is very familiar with the organization and its workings.

# Global Standards Collaboration Machine-to-Machine Standardization Task Force

**MANY MACHINE-TO-MACHINE (M2M) STANDARDIZATION UNDERTAKINGS ARE** under way around the world. TIA, along with other Standards Developing Organizations (SDOs) from North America, Europe and Asia, is actively building protocols and other norms that will speed up the expansion of the M2M market by allowing economies of scale. Furthermore, other groups are also creating standards in vertical M2M sectors such as, but not limited to, smart grid, healthcare, smart buildings and automotive. The need for communication among SDOs and similar organizations is therefore critical to avoid duplication of work and effort.

**Dr. Jeffrey O. Smith**

Recognizing the need for coordination on M2M standardization on a global scale, the M2M Standardization Task Force (MSTF) was created as a result of the Global Standards Collaboration meeting (GSC-15) held in Beijing, China, Aug. 30–Sept. 2, 2010, following a TIA proposal.

At GSC, the world's leading telecommunications and radio standards organizations meet on an approximately annual basis to promote innovation and collaboration on a broad spectrum of standards topics. Some hundred participants from Participating Standards Organizations (PSOs) and the International Telecommunication Union (ITU, a United Nations agency) attend, as well as observers from additional groups. The current GSC members are the ITU, Alliance for Telecommunications Industry Solutions (ATIS), Association of Radio Industries and Businesses (ARIB) of Japan, China Communications Standards Association (CCSA), European Telecommunications Standards Institute (ETSI), ICT Standards Advisory Council of Canada (ISACC), TIA, Telecommunications Technology Association (TTA) of Korea and Telecommunications Technology Committee (TTC) of Japan.

GSC's mandate is to provide a venue for the leaders of the PSOs and the ITU to exchange information freely on the progress of standards development in the different regions and the state of the global standards development environment, and to collaborate in planning future standards development to gain synergy and to reduce duplication. GSC was created in 1990 in Fredericksburg, Va., at the Inter-regional Telecommunications Standards Conference (ITSC), and the first GSC meeting was held in 1994 in Melbourne, Australia.

The role of the GSC MSTF is to facilitate global coordination and harmonization, as well as to outline the worldwide M2M activity map and make recommendations on current and future activities. It is noteworthy that the GSC resolution creating the MSTF (GSC-15-CL-33) *"encourages broad participation in the MSTF by GSC members and beyond."* Other standards groups and forums worldwide with a horizontal (across markets) scope that work on closely related topics such as the Internet of Things, wireless sensor networks, mobile device management and many others are therefore intended to be an integral part of the MSTF initiative.

Dr. Jeffrey O. Smith, Chief Technology Officer of Numerex and Chair of TIA Engineering Committee TR-50, Smart Device Communications, was appointed convenor of the GSC MSTF during GSC-15. TIA will host the first international meeting of the MSTF on May 18, 2011, during the TIA 2011: Inside the Network event, in Dallas, Texas.

The MSTF will report on its activities and recommendations during GSC-16, which will be hosted by ISACC in Halifax, Nova Scotia, Oct. 31–Nov. 3, 2011.

# **TR-8:** Mobile and Personal Private Radio Standards

**ENGINEERING COMMITTEE TR-8 FORMULATES AND MAINTAINS STANDARDS FOR** private radio communications systems and equipment for both voice and data applications. The TR-8 committee addresses all technical matters for systems and services, including definitions, interoperability, and compatibility and compliance requirements. Systems addressed by these standards include business and industrial dispatch applications, as well as public safety applications such as police, ambulance and firefighting.


**The types of systems addressed by these standards include business and industrial dispatch applications, as well as public safety applications such as police, ambulance and fire fighting.**

## SIGNIFICANT ACCOMPLISHMENTS

TR-8 is the oldest of the TIA standards committees, tracing its roots to the early days of the use of two-way land mobile radio. The standards formulated by TR-8 have traditionally included standards for analog frequency-modulated radio systems and applications of commercial dispatch radio, industrial communications, transportation systems and public safety communications. The latter includes police, fire and paramedic use. While TR-8 continues to maintain standards relating to analog communications, the majority of current work is on standards for digital radio systems. The migration to digital systems is driven by the need for more spectrally efficient communications systems, as well as the need for advanced features to enable secure and reliable communications. Interoperability among equipment supplied by various manufacturers and among systems operated by different agencies is also a critical aspect of the standards that are developed. The work of TR-8 has included standards that cover all aspects of communications systems, including radio equipment, network infrastructure equipment, antenna systems, and propagation and interference models. The standards developed by TR-8 are crucial for the advanced, mission-critical communications systems of today and the future. TR-8 continues to lead in the development of standards for these important communications systems.

## 2010 OVERVIEW

The TR-8 committee is responsible for standards relating to Private Land Mobile Radio systems and equipment. The committee is made up of 14 active subcommittees, which formulate standards for many of the technologies involved in private radio systems. The work of these subcommittees covers topics from antennas and propagation to equipment measurement and performance, over-the-air protocols and infrastructure wireline interface. The radio systems can range in complexity from analog frequency-modulated technology to advanced digital radio systems to broadband wireless systems. This equipment is often used in critical applications requiring reliable communications. Therefore, issues of redundancy and reliability are of prime importance. In addition, issues of interoperability among communications systems of different jurisdictions and from different manufacturers are important. The standards created by this committee and its subcommittees are intended to promote reliable and interoperable communications systems.

Much of the work of the committee continues to be the formulation of standards for Project 25. These are standards sponsored by the Association of Public-Safety Officials International (APCO), the National Association of State Telecommunications Directors (NASTD) and agencies of the federal government. Project 25 standards are developed to provide digital voice and data communications systems suited for public safety and first-responder applica-

tions. The current Project 25 standards suite consists of 68 documents: 48 TIA standards, 21 of which are ANSI standards; and 20 Telecommunications Systems Bulletins. Several new areas for standardization include Project Phase II, an extension of the technology to a two-slot TDMA system. This system results in a radio channel efficiency of one talk path for every 6.25 kHz of spectrum. Several standards for the Inter-RF Subsystem Interface (ISSI), Console Interface and Fixed Station Interface (FSI) have also been worked on and published. These fixed-network standards round out Project 25 to include wireline interface standards.

The work of TR-8 makes extensive use of participation and input by users of the technology. In that respect, TR-8 is unique among engineering standards committees. In order to encourage such participation, much of the initial standards drafting work is carried out in task groups made up of technology users as well as TIA member organizations. This affords user representatives a voice with the manufacturers in the early standards drafting work.

TR-8 and its subcommittees meet quarterly, with many of the subcommittees and working groups having frequent additional teleconference calls and face-to-face working sessions. The 2010 quarterly meetings were held in conjunction with Project 25 committee sessions.

## 2010 ACTIVITIES

**TR-8.1, Equipment Measurement Procedures,** is responsible for formulation of standards for measurement methods for radio frequency (RF) transmitter and receiver equipment. During the past year, the subcommittee has revised and published update TIA-603-D, *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards,* which addresses analog equipment. In addition, the subcommittee published an addendum to TIA-102.CAAA-C, *Digital C4FM/CQPSK Transceiver Measurement Methods,* which clarifies the requirements for the fading channel simulator. Drafting work has continued on the transceiver measurement methods for Project 25 Phase II two-slot TDMA transceivers.

**TR-8.3, Encryption,** is responsible for standards relating to encryption. Re-affirmation of TIA-102.AAAB-A, *Project 25 Digital Land Mobile Radio – Security Services Overview,* was approved by the subcommittee. Work also continued to upgrade documents in the area of Over-the-Air-Rekeying (OTAR), Link Layer Authentication and Key Fill Device Interface Protocol.

**TR-8.4, Vocoders,** is responsible for standards relating to vocoders. The subcommittee published TIA-102.BABG, *Project 25 Enhanced Vocoder Methods of Measurement for Performance,* to provide measurement methods for enhanced vocoders used in Project 25 Phase I and Phase II.

**TR-8.5, Signaling and Data Transmission,** is responsible for standards relating to data applications. In the past year, the subcommittee published four documents. TSB-102.BAJA-A, *Project 25 Location Services Overview,* and TIA-102.BAJC, *Tier 2 Location Services Specification,* were published, rounding out the documents for location services. Upgrade document TIA-102.BAEE-B, *Project 25 Radio Management Protocol,* and TSB-102.BAJD, *Project 25 TCP/UDP Port Number Assignment,* were also published. Upgrades to two of the packet data specifications are also in the drafting phase.

**TR-8.6, Equipment Performance Recommendations,** is responsible for standards relating to

**The work of TR-8 makes extensive use of participation and inputs by users of the technology. In that respect, TR-8 is unique among engineering standards committees.**

transceiver performance. During the past year, the subcommittee worked in conjunction with TR-8.1 on the publication of TIA-603-D, *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*. In addition, the subcommittee is continuing the development of transceiver performance recommendations for Project 25 two-slot TDMA transceiver equipment.

**TR-8.8, Broadband Data Systems,** is responsible for standards relating to broadband data systems for use in public safety applications. The subcommittee has remained dormant, owing to a change in direction on broadband data systems by the FCC.

**TR-8.10, Trunking and Conventional Control,** is responsible for standards relating to trunking systems. The subcommittee has been working on upgrades and addenda to several of the trunking standards. Much of the work has been in response to upgrades required for adding Project 25 Phase II two-slot TDMA.

**TR-8.11, Antenna Systems,** is responsible for formulation of standards for antennas and antenna sub-systems. The subcommittee published TSB-179, *Terrestrial Land Mobile Radio – Antenna Systems – Total "Antenna System" Return Loss Measurements*. The subcommittee also published TSB-171, *Terrestrial Land Mobile Radio – Antenna Systems – History and Technical Analysis of the Quarter-Wave Monopole Over Finite Ground Plane as a Gain Standard*. Three other documents relating to antennas and antenna systems are in the drafting process.

**TR-8 met in Mesa, Arizona on January 27, 2011.**

**TR-8.12, Two-Slot TDMA,** is responsible for formulation of standards for two-slot TDMA systems. The documents comprising the two-slot TDMA air interface have been completed. TSB-102.BBAA, *Two-Slot TDMA Overview,* has been published. In addition, TIA-102.BBAC, *Project 25 Phase 2 Two-Slot TDMA Media Access Control Layer Description,* has been published. Future work is continuing in the area of conformance testing.

**TR-8.15, Common Air Interface,** is responsible for formulation of standards for the air interface for Phase I Project 25 systems. The subcommittee published revision TIA-102.BAAD-A, *Project 25 Conventional Procedures*. In addition, TIA-102.BAAC-C, *Common Air Interface Reserve Values,* was balloted and approved for publication.

**TR-8.17, Radio Frequency (RF) Exposure,** is responsible for standards relating to testing, reporting and labeling issues relating to RF exposure limits. The subcommittee is currently working on a Telecommunications Systems Bulletin (TSB) relating to Specific Absorption Rate (SAR) testing.

**TR-8.18, Wireless Systems – Interference and Coverage,** deals with issues relating to radio propagation and interference. The subcommittee published TSB-88.1-C-1, an addendum to *Wireless Communications Systems Performance in Noise and Interference Limited Situations – Part 1 – Recommended Methods for Technology Independent Performance Modeling,* and TSB-88.3-C-1, an addendum to *Wireless Communications Systems Performance in Noise and Interference Limited Situations – Part 3 – Performance Verification*. Work is continuing on TSB-88.1-D, a revision to *Wireless Communications Systems Performance in Noise and Interference Limited Situations – Part 1 – Recommended Methods for Technology Independent Performance Modeling,* and TSB-88.2-D, a revision to *Wireless Communications Systems Performance in Noise and Interference Limited Situations – Part 2 – Propagation and Noise*. Additional work is being done on a document for Radiowave Propagation Path Loss.

**TR-8.19, Wireline System Interfaces,** is responsible for standards for radio system network interfaces. The subcommittee published TIA-102.CACD-A, an upgrade to *Inter-RF Subsystem*

*Interface – Interoperability Test Procedures for Trunked Systems Involving the ISSI.*

**TR-8.25, Compliance Assessment,** is responsible for standards for compliance assessment and interoperability issues. The subcommittee published three documents in 2010. These include two test interoperability documents and a document listing recommended tests for Inter-RF Subsystem Interface (ISSI) in trunked systems. An overview document for the Project 25 Compliance Assessment Program has been approved for publication.

**To find out more about participating in TR-8, please contact Ronda Marrow: rmarrow@tiaonline.org, +1.703.907.7974.**

## TR-8: MOBILE AND PERSONAL PRIVATE RADIO STANDARDS

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*EF Johnson Technologies*

**VICE CHAIR, TR-8: ALAN WILSON**
*Harris Corporation*

### SUBCOMMITTEES

**TR-8.1 Equipment Measurement Procedures**
CHAIR: John Oblak, *EF Johnson Technologies*

**TR-8.3 Encryption**
CHAIR: David Vander Staay, *Thales Communications, Inc.*

**TR-8.4 Vocoders**
CHAIR: Richard Frye, *Frye-Comm Consulting LLC*

**TR-8.5 Signaling and Data Transmission**
CHAIR: Jim Eastwood, *Motorola, Inc.*

**TR-8.6 Equipment Performance Recommendations**
CHAIR: Terry Mansfield, *Motorola, Inc.*

**TR-8.8 Broadband Data Systems**
CHAIR: John Gough, *Harris Corporation*

**TR-8.10 Trunking and Conventional Control**
CHAIR: John Lambrou, *Motorola, Inc.*

**TR-8.11 Antenna Systems**
CHAIR: Ronald Jakubowski, *TX RX Systems, Inc.*

**TR-8.12 Two-Slot TDMA**
CHAIR: Alan Wilson, *Harris Corporation*

**TR-8.15 Common Air Interface**
CHAIR: Jim Eastwood, *Motorola, Inc.*

**TR-8.17 RF Exposure**
CHAIR: Robert Speidel, *Harris Corporation*

**TR-8.18 Wireless Systems Interference and Coverage**
CHAIR: Tom Rubinstein, *Motorola, Inc.*

**TR-8.19 Wireline System Interfaces**
CHAIR: Jerry Drobka, *Motorola, Inc.*

**TR-8.25 Compliance Assessment**
CHAIR: Tess Zagaruyka, *Datron World Communications*

### TR-8 COMMITTEE PARTICIPANTS

ADC, Aeroflex, Alcatel-Lucent, APCO Project 25, Aselsan Inc., Cassidian Communications, Cisco Systems, Inc., CML Microcircuits (USA) Inc., CSI Telecommunications, Inc., Daniels Electronics Ltd., Datron World Communications, Digital Voice Systems, Inc., EF Johnson, Ericsson, Inc., Etherstack, Frye-Comm Consulting LLC, General Dynamics C4 Systems, Harris Corporation, Icom America Inc., Industry Canada, Kenwood USA Corp., Lockheed Martin Corporation, M/A-Com, Inc., Midland Radio Corp., Motorola Solutions, National Technical Systems (NTS), New Mexico State Police, NIST-OLES, Nokia Inc., Oregon State Police, PowerTrunk, Raytheon, RELM Wireless Corp., RTKL Associates Inc., SAIC, Sigma Delta Communications, Inc., Sony Wireless Tech Division, Spectrum Watch, State of South Carolina, Tait Radio Communications, TE Connectivity, Technisonic Industries Ltd., Telchemy, Inc., Texas Instruments, Inc., Thales Communications, Inc., TranSwitch Corporation, TX RX Systems, Inc., Tyco Electronics, U.S. Department of Commerce, U.S. Department of Homeland Security, U.S. Department of Justice, U.S. Fish & Wildlife/DOI, and Zetron, Inc.

# **TR-14:** Point-to-Point Communications Systems

**SINCE 1959, ENGINEERING COMMITTEE TR-14 HAS BEEN RESPONSIBLE FOR** voluntary standards and recommended practices related to terrestrial fixed point-to-point radio communications equipment and systems (microwave radio), primarily in the frequency bands above 960 MHz.

The work of TR-14 goes beyond the design, fabrication and production of antenna towers. TR-14's specifications allow carriers to effectively and reliably relay communications via antenna towers. TR-14.7's task group, Structural Reliability, deals with structural performance and reliability issues pertinent to the structures utilized in the telecommunications industry. As the industry's support structures continue to age, reliability and maintenance issues will be crucial to the longevity of the industry's infrastructure. The committee is also involved in developing standards for the minimum loading requirements for towers under construction, alteration or maintenance, and addressing specialized equipment such as gin poles, frames, hoists and the temporary supports necessary to safely complete those tasks.

One of TR-14's most popular standards is TIA-222, Revision G, *Structural Standard for Antenna Supporting Structures and Antennas*. The objective of this standard is to provide recognized literature for antenna-supporting structures and antennas pertaining to minimum-load requirements and design criteria for steel and concrete.

**The work of TR-14 goes beyond the design, fabrication and production of antenna towers.**

## SIGNIFICANT ACCOMPLISHMENTS

TR-14.7 is the formulating subcommittee for the popular TIA standard, TIA-222, Revision G, *Structural Standard for Antenna Supporting Structures and Antennas*. The standard provides the requirements for structural design and fabrication of new, and modification of existing, structural antennas, antenna-supporting structures, structural components, guy assemblies, insulators and foundations. The standard is referenced in the International Building Code and as such has acceptance with building officials.

## 2010 OVERVIEW

TR-14 operated in three key areas during 2010. At the request of the industry, the development of a standard for small wind turbine structure design guidelines was begun. In the area of structural reliability, development continued on standards for the design of monopole base plates. Lastly, work was continued on revising TIA-1019, *Structural Standards for Steel Gin Poles Used for Installation of Antenna Towers and Antenna Supporting Structures*.

## 2010 ACTIVITIES

TR-14 focused some of its efforts during the past year on beginning the development of small wind turbine structure design guidelines. As the country moves to more environmentally-friendly methods of developing energy, our telecommunications support structures will play a role. Many of our member manufacturers and engineers are already being requested to utilize telecommunications structures for small turbines and the generation of power. This new standard will be associated with the TIA-222-G group of standards and is anticipated to be in the mature draft stage during 2011.

With respect to Structural Reliability, the subcommittee continued developing standards for the design of monopole base plates during 2010. Typically a subject left to manufacturers and engineering judgment, this connection is crucial to the safe performance of these structures. This connection is susceptible to fatigue

and has not been consistently designed and analyzed by the industry. The TR-14.7 community is addressing this issue as it develops this new standard.

TR-14.7 continued work on the revision to TIA-1019, *Structural Standards for Steel Gin Poles Used for Installation of Antenna Towers and Antenna Supporting Structures*. First released in 2004, the standard was intended to provide minimum design criteria for the design and use of steel gin poles for installation of antennas and antenna supporting structures. The standard is being updated to provide minimum loading requirements for towers under construction, alteration or maintenance, and to address specialized equipment such as gin poles, frames, hoists and the temporary supports necessary to safely complete those tasks, along with the design requirements for a gin pole. The standard will consider special construction requirements and processes commonly used when removing an existing antenna from an existing tower, or removing all or a portion of an existing tower. The revised standard will be TIA-1019-A, *Standard for Installation, Alteration and Maintenance of Antenna Supporting Structures and Antennas,* and will be published during 2011.

**To find out more about participating in TR-14, please contact Teesha Jenkins: tjenkins@tiaonline.org, +1.703.907.7706.**

## **TR-14:** POINT-TO-POINT COMMUNICATIONS SYSTEMS

**CHAIR, TR-14: BRIAN REESE, PE**
*ReliaPOLE Inspection Services Company*

**VICE CHAIR, TR-14: JOHN ERICHSEN, PE, SE**
*EET LLC*

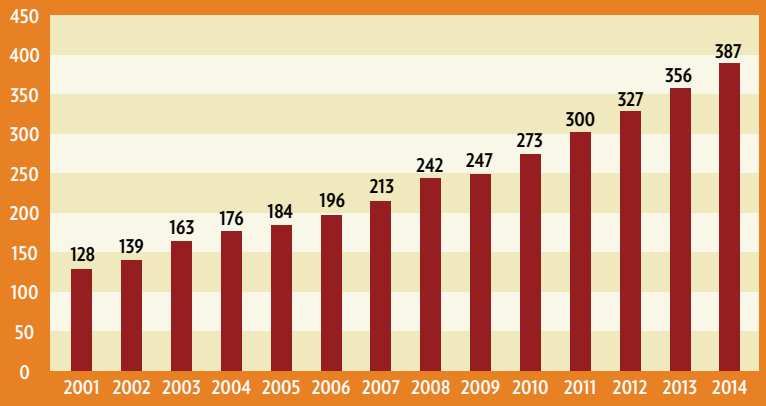
### SUBCOMMITTEE

**TR-14.7 Structural Standards for Steel Antenna Towers and Antenna Supporting Structures**
**CHAIR:** Brian Reese, *PE, ReliaPOLE Inspection Services Company*
**VICE CHAIR:** John Erichsen, *PE, SE, EET LLC*

### TR-14 COMMITTEE PARTICIPANTS

4SE, Inc., Aero Solutions, LLC, American Tower Corporation, AT&T Mobility, B&C Contracting Company, B&T Engineering, Inc., Bechtel Telecom, Bentley Systems, Inc., Black & Veatch Telecommunication, Broadcast Tower Technologies, Inc., C Faulkner Engineering, Cell Trees, Inc., CMX, Crown Castle International Corp., CSI Telecommunications, Inc., Davidson Engineering, LLC, DaVinci Engineering Inc., EET, L.L.C, Ehresmann Engineering, Inc., Electronics Research Inc., FAL Associates, FDH Engineering, FWT, Inc., Glen Martin Engineering, Global Tower Partners, GPD Associates, Industrial Engineering & Testing, Industry Canada, ISE Incorporated, KCI Technologies, Inc., KPFF Consulting Engineers, Malouf Engineering International, MLD Engineering Solutions, Inc., MUTI, NTIA, Paul J. Ford and Company, ReliaPOLE Inspection Services Co., Rohn Products LLC, RTKL Associates Inc., Sabre Towers & Poles, Shively Labs, Sioux Falls Tower Specialists, Stainless LLC, Stealth Concealment Solutions, Inc., Tower Consultants, Inc., Tower Engineering Professionals, Inc., Tower Technology, Towerkraft Engineering, P.C., Turris Corporation, U.S. Department of Commerce, Valmont Communications, Walker Engineering Inc., Weisman Consultants, and WesTower Comunications Inc.

### CELL SITES IN THE UNITED STATES (THOUSANDS)




Source: *TIA's 2011 ICT Market Review and Forecast*

# **TR-30:** Multi-Media Access, Protocols and Interfaces


**For more than 50 years, TR-30 has produced numerous standards for data, facsimile and telecommunications equipment.**

**ENGINEERING COMMITTEE TR-30 WAS CREATED IN 1958 TO DEVELOP STANDARDS** related to the functional, electrical and mechanical characteristics of interfaces between data circuit terminating equipment (DCE), data terminal equipment (DTE) and multimedia gateways, the telephone and voice over Internet protocol (VoIP) networks, and other DCE and facsimile systems.

## SIGNIFICANT ACCOMPLISHMENTS

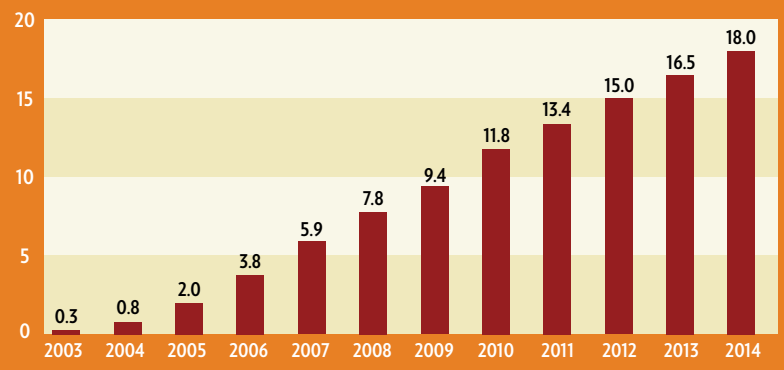
For more than 50 years, TR-30 has produced numerous standards for data, facsimile and telecommunications equipment. Dating back to 1962, the RS-232 standard (now TIA-232-F, *Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange*) has provided a standardized interface between terminal equipment and data modems. This standard continues in use today. TR-30 has developed many other interface standards similar to TIA-232-F, providing for various speeds and functions.

Significant standards have been produced that enable those with disabilities to communicate better. TIA-825-A, *A Frequency Shift Keyed Modem for Use on the Public Switched Telephone Network,* was developed specifically for communications devices used by individuals with hearing loss. TIA-1001-A, *Transport of TIA-825-A Signals over IP Networks*, assures proper transport of the TIA-825-A signals over modern Internet protocol networks.

In the area of testing and evaluating equipment, TR-30 has produced a number of standards. Significant among them are: TSB-38-A, *Test Procedure for Evaluation of 2-Wire 4-KHz Voiceband Duplex Modems,* and TIA-921-A, *Network Model for Evaluating Multimedia Transmission Performance over Internet.*

TR-30 provides the United States inputs to the ITU-T for the development of recommendations in Study Group 16, Question 14. TR-30 has been the primary input for this work since the question's inception. In addition, TR-30 is providing inputs to ITU-T Study Group 12.

**VOIP SPENDING IN THE UNITED STATES ($ BILLIONS)**




Source: *TIA's 2011 ICT Market Review and Forecast*

## 2010 OVERVIEW

TR-30 and its subcommittees had another active year in 2010. TR-30.1 maintained its review of the work taking place in ITU-T Study Group 16 and provided participating company contributions to that work. TR-30.2 continued to maintain the many interface standards under its oversight. TR-30.3 continued to develop the revision of ANSI/TIA-921-A, *Network Model for Evaluating Multimedia Transmission Performance over Internet Protocol.*

TR-30 provides many technical contributions to the work taking place in ITU-T Study Group 12 (SG 12), Performance, QoS and QoE, and SG 16, Multimedia Coding, Systems and Applications. Many of these contributions become United States contributions to the ITU-T work through

the U.S. Department of State International Telecommunication Advisory Committee (ITAC) process. In addition to technical contributions, liaisons have been established with a number of other ITU-T Study Groups.

## 2010 ACTIVITIES

**TR-30.1, Modems,** had an active year providing review and contributions to the work of ITU-T SG 16, Question 14, Voiceband modems and facsimile terminals protocols: specification, performance evaluation and interworking with NGN. The subcommittee has had a long-term and close relationship with SG 16. During 2010, TR-30.1 reviewed and provided inputs for the following SG 16 work:

- Revision of T.38, *Procedures for real-time Group 3 facsimile communication over IP networks*
- V.153, *Interworking between T.38 and V.152 using IP peering for realtime facsimile services*
- G.IP2IP, *Signal processing functionality and performance of an IP-to-IP voice gateway, optimized for the transport of voice and voiceband data*

**TR-30.2, DTE-DCE Interfaces,** worked primarily in maintenance mode during 2010. The subcommittee did approve TIA-678-B, *Data Transmission Systems and Equipment – Serial Asynchronous Automatic Dialing and Control for Character Mode DCE on Wireless Data Services* for publication. This revision aligned references contained in TIA-678 with ITU-T Recommendation V.250, *Serial asynchronous automatic dialing and control.*

TR-30.2 is also closely following the development of ITU-T draft recommendation V.254, *Asynchronous serial command interface for assistive and multi-functional communication devices.* The work on this recommendation took place in ITU-T SG 16, Question 14. V.254 has been approved by the ITU-T after inputs from TR-30.2 were received.

**TR-30.3, Data Communications Equipment Evaluation and Network Interfaces,** had an extremely active year as it focused its work on revising TIA-921-A, *Network Model for Evaluating Multimedia Transmission Performance over Internet Protocol.* TR-30.3 also worked with ITU-T SG 12 to harmonize ITU-T G.1050, *Network model for evaluating multimedia transmission performance over Internet Protocol,* with the revision of TIA-921-A. The proposed revision models the mechanisms that contribute to packet delay, jitter and loss: interfering streams, queue delays in network elements, and the characteristics of specific access technologies using discrete event simulation. The intent is to provide more realism than the earlier versions of TIA-921. TR-30.3 has now completed this work and has prepared a draft of TIA-921-B for ballot. ITU-T SG 12 agreed to initiate the Alternative Approval Process (AAP) for G.1050 and it was submitted at the SG 12 Plenary in January 2011 for Consent. The document has also been forwarded as a liaison to ITU-T SG9 and SG 16, as well as to the Video Quality Experts Group (VQEG) and the IETF. TR-30.3 is participating in continuing efforts supporting both TIA-921-B and ITU-T G.1050.

**To find out more about participating in TR-30, please contact Ronda Marrow: rmarrow@tiaonline.org, +1.703.907.7974.**

## TR-30: MULTI-MEDIA ACCESS, PROTOCOLS AND INTERFACES

**CHAIR, TR-30: FRED LUCAS**
*FAL Associates*

### SUBCOMMITTEES

**TR-30.1 Modems**
CHAIR: Fred Lucas, *FAL Associates*

**TR-30.2 DTE-DCE Interfaces**
CHAIR: Fred Lucas, *FAL Associates*

**TR-30.3 Data Communications Equipment Evaluation and Network Interfaces**
CHAIR: Jack Douglas, *PacketStorm Communications Inc.*

### TR-30 COMPANY PARTICIPANTS

ADTRAN, Alcatel-Lucent, Anue Systems, Broadcom Corporation, Cisco Systems, Inc., CSI Telecommunications, Inc., Defense Information Systems Agency, FAL Associates, Intel Corporation, Intellon, LSI Corporation, Motorola Solutions, Nexans/Berk-Tek, Nokia Siemens Networks, PacketStorm Communications, Inc., Panasonic Corp. of North America, Sony Wireless Tech Division, Telchemy, Incorporated, Telcordia Technologies, and Texas Instruments, Inc.

# **TR-34:** Satellite Equipment and Systems

**The committee has been responsible for developing voluntary standards related to satellite communications systems in both the space and terrestrial segments.**

**SINCE 1995, ENGINEERING COMMITTEE TR-34 HAS BEEN RESPONSIBLE FOR** developing voluntary standards related to satellite communications systems in both its space and terrestrial segments. The committee focuses on standards for space-borne and terrestrial hardware, interfaces on standards for satellite and terrestrial systems, and the efficient use of spectrum and orbital resources, including sharing between satellite and terrestrial services.

TR-34 is comprised of one subcommittee, 34.1, which is responsible for standards and studies related to satellite communications systems and spectrum/orbit sharing. The subcommittee aims to develop standards for achieving interoperability between satellite and terrestrial systems, networks and services.

Among the many accomplishments of TR-34 is the development of a suite of standards, housed within the TIA-1040 series, that provides an introduction to the physical-layer specification for the Satellite Earth Systems (SES) Broadband Satellite Multimedia (BSM) Regenerative Satellite Mesh-A (RSM-A) air interface family.

On the international front, TR-34 has contributed to the joint standards work of the European Telecommunications Standards Institute's (ETSI) SES technical committee and its BSM technical committee, which resulted in the standard on Connection Control Protocol C2P protocol activities.

## SIGNIFICANT ACCOMPLISHMENTS

The key suite of documents developed by the TR-34 Committee is the Regenerative Satellite Mesh-A (RMS-A) Air Interface. This suite of standards in the TIA-1040 series provides an introduction to the physical layer specification for the SES BSM Regenerative Satellite Mesh-A (RSM-A) air interface family. It consists of a general description of the organization of the physical layer with reference to the parts of this multi-part deliverable, where each function is specified in more detail.

Another key area of development is the joint standards work of the ETSI technical committees on SES and BSM, which resulted in the standard on Connection Control Protocol (C2P) activities. The TIA-1073.002, *Satellite Network Modem System (SNMS) Encryption Requirements,* standard addresses the following issues: how inputs from ETSI/DVB can be utilized in the SNMS standard; how connection request profiles relate to channel capacity; and how Return Channel Satellite Terminals (RCSTs) determine their rate parameters from the profiles. The standard also supports important functionality such as Quality of Service (QoS), encryption and the generation of dummy traffic. In addition, the TR-34 committee developed TIA-1039, *QoS Signaling for IP QoS Support,* which defines the QoS signaling standard for use in IPv4 and IPv6 network-layer protocols. This mechanism allows the necessary resources to be allocated to a flow (or group of flows) as they traverse the communications network. This signaling scheme is designed to work "in-band" through an installed router. Thus, QoS is set up in real time across the network without a separate, out-of-band, software signaling structure such as Reservation Protocol (RSVP). The resource "request" and (when needed) the "response" messages are incorporated into the user data packets themselves, allowing the QoS require-

ments to be set up during the initial network traversal from sender to receiver (and back if needed), streamlining the packet management process.

## 2010 OVERVIEW

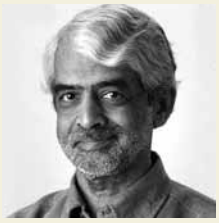
TR-34 and its subcommittees continued joint activities with ETSI for mobile satellite communications standardization by approving the GMR-1 3G publication and participating in working groups on S-band emissions requirements, fixed satellite and new DVB-RCS-2 standards.

## 2010 ACTIVITIES

**TR-34.1, Communications and Interoperability,** held one meeting in April 2010 at TIA Headquarters in Arlington, Va. TR-34.1 unanimously approved the J-STD-782, *GEO-Mobile Radio Interface Specifications (Release 3): Third Generation Satellite Packet Radio Service (GMR-1 3G)*, standard, as a joint publication by TIA and ETSI. The standard accommodates third-generation 3GPP-compatible technology and includes the ITU Radiocommunication Study Group 4 ITU-R M.1457-SAT detailed specifications of the radio interfaces for the satellite component of International Mobile Telecommunications-2000 (IMT-2000). GMR-1 3G is designed for use in L-band and S-band mobile satellite licensed spectrum. The subcommittee chair notified the committee that the ITU approved GMR-1 3G as an IMT 2000 Satellite Interface Standard.

**To find out more about participating in TR-34, please contact Ronda Marrow: rmarrow@tiaonline.org, +1.703.907.7974.**

## TR-34: SATELLITE EQUIPMENT AND SYSTEMS



**CHAIR, TR-34: PRAKASH CHITRE**
*ViaSat, Inc.*

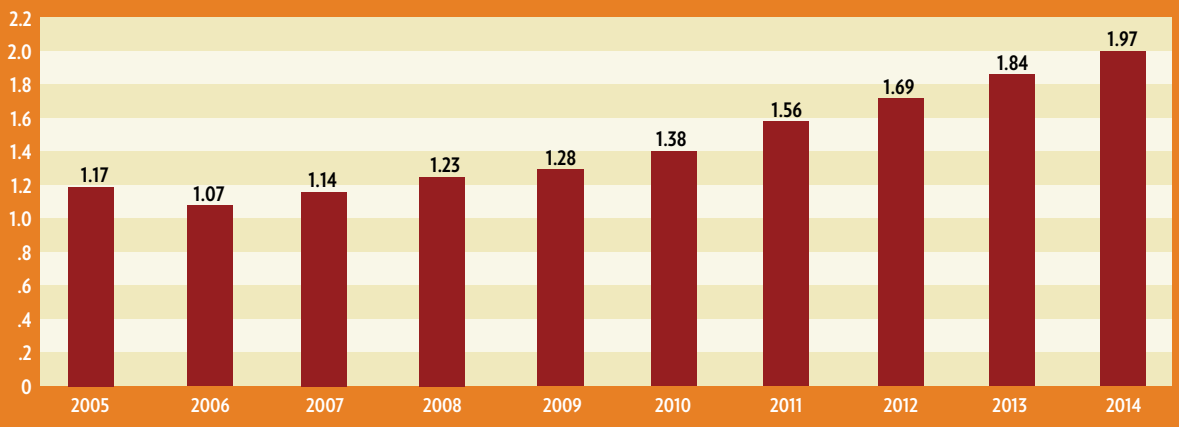
### SUBCOMMITTEE

**TR-34.1 Communications and Interoperability**
**CHAIR:** Tony Noerpel, *Hughes Network Systems*

### TR-34 COMMITTEE PARTICIPANTS

AASKI Technology, Inc., Advantech Satellite Networks, Anagran, Inc., Cisco Systems, Inc., Comtech EF Data, CSI Telecommunications, Inc., Defense Information Systems Agency, Gilat Satelite Networks Ltd., Globalstar, Hughes Network Systems, LLC, Lockheed Martin Corporation, MITRE Corp., RTKL Associates Inc., Telcordia Technologies, ViaSat, Inc.

### MSS REVENUE WORLDWIDE ($ BILLIONS)




Source: *TIA's 2011 ICT Market Review and Forecast*

# **TR-41:** User Premises Telecommunications Requirements

**Work in developing a new standard providing requirements for specialty telephones intended to address the needs of people with mild, moderate and severe hearing loss is expected to begin in early 2011.**

**SINCE 1976, ENGINEERING COMMITTEE TR-41 HAS BEEN DEVELOPING VOLUNTARY** standards for telecommunications terminal equipment and systems, specifically those used for voice services, integrated voice and data services, and Internet protocol (IP) applications. Together with its three subcommittees and their working groups, the committee develops performance and interface criteria for equipment, systems and private networks, as well as the information necessary to ensure their proper interworking with each other, with public networks, with IP telephony infrastructures and with carrier-provided private-line services.

In addition, TR-41 develops criteria for preventing harm to the telephone network, which become mandatory when adopted by the Administrative Council for Terminal Attachments (ACTA). The committee is also engaged in providing input on product safety issues, identifying environmental considerations for user premises equipment and addressing the administrative aspects of product approval processes.

## SIGNIFICANT ACCOMPLISHMENTS

Among TR-41's first products were Recommended Standards RS-464 on PBXs, RS-470 on Telephones, and RS-504 on Hearing Aid Compatibility. RS-504 was adopted verbatim as Part 68.316 of the FCC Rules. Other standards include EIA/TIA-571 on Environmental Considerations, TIA/EIA-596 on Network Channel Terminating Equipment, TIA/EIA-631 on RF Immunity, TIA/EIA-689 on PBX and Key System Support of Emergency Calling Services, TIA/EIA-777 on Caller ID Performance, TIA/EIA-855 on Stutter Dial Tone Performance, TIA/EIA-810 and TIA-920 on Narrowband and Wideband Voice Performance of Digital Telephones, TIA/EIA-811 on VoIP Feature Telephones, TIA-912 on VoIP Voice Gateways, and TIA-1003 on Wireless LAN IP Telephony Endpoints. Many of these documents have now gone through multiple revisions.

When the FCC deregulated connection to the public switched network in 2000, TR-41 transformed the Part 68 rules into the TIA-968 Network Harms Criteria standard, which became a mandatory requirement for terminal equipment after it was adopted by ACTA. Companion Part 68-related standards are TIA-1096 on Connectors and TIA-168 on Labeling Requirements. More recent standards include TIA-1057 on Link Layer Discovery Protocol for Media Endpoint Devices, TIA-1062 and TIA-1063 on Digital and Analog Port Requirements for Gateways and Terminal Adapters, and TIA-1083, a much-improved Hearing Aid Compatibility (HAC) standard. Many of these documents have also already undergone revision.

TR-41 has also created a number of Telecommunications Systems Bulletins (TSBs), which are intended to provide important information to industry in cases where a standard would not be appropriate. The TSBs created by TR-41 include the TSB-31 Part 68 Measurement Guidelines, TSB-32 on Private Network Transmission Plans, TSB-116 on VoIP Voice Quality Recommendations, the TSB-129 Regulatory Approval Guide, TSB-146 on VoIP Telephony Support of Emergency Calling Services and TSB-160 on IP Network Synchronization.

## 2010 OVERVIEW

TR-41 will be continuing its work in the areas of performance standards for analog and digital wireline terminals, network harms criteria, and environmental and product safety considerations. We expect to complete work started in

2010 on development of a standard for protection of user premises Smart Grid equipment that connects to both power lines and metallic communications lines from the effects of lightning-induced voltage surges.

The existence of receive volume controls in virtually all telephony products has brought into question the value of Receive Loudness Rating (RLR) as a useful measure of receive performance. Instead, we will continue moving toward the use of Receive Level measured in terms of dB SPL as we have done in developing the analog speakerphone requirements. Specifically, this is the approach that will be taken in revising the analog handset telephone transmission requirements in the coming year. We will also be introducing the concept of Conversational Gain (gain relative to normal speech levels at a 1 meter listening distance) to replace the current method of specifying receive gain as the change in RLR value.

In addition to the revision of the analog handset telephone transmission requirements, interest has been expressed in developing a new standard providing requirements for specialty telephones intended to address the needs of people with mild, moderate and severe hearing loss. This work is expected to begin in early 2011 and will include Conversational Gain and Tonal Control requirements for these three categories of hearing loss.

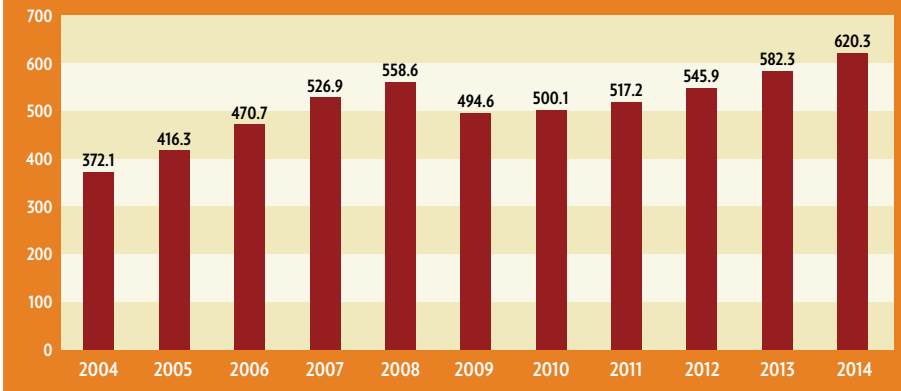
## 2010 ACTIVITIES

TR-41 held three week-long meetings with its subcommittees and working groups in 2010. For the second year in a row, the normal August face-to-face meeting was replaced by a series of Web-based teleconferences. Additional interim teleconference meetings were conducted as needed. The Institute of Electrical and Electronics Engineers (IEEE) Subcommittee on Telephone Instrument Testing (STIT) collocated with TR-41 for two meetings, allowing joint sessions to be held with a number of the TR-41.3 working groups.

TR-41 exchanged liaison information with a number of standards bodies, councils and associations during 2010, including ACTA, the Alliance for Telecommunications Industry Solutions (ATIS) Sustainability in Telecom Electrical and Protection Committee's Network Electrical Protection Subcommittee (STEP-NEP), the American National Standards Institute (ANSI) Accreditation Services, Industry Canada's Terminal Attachment Program Advisory Committee (TAPAC), and Underwriters Laboratories (UL).

TR-41 participants serve as official TIA representatives to Accredited Standards Committee C63 addressing electromagnetic compatibility issues and to the UL/CSA Technical Harmonization Committee for developing a North American version of the IEC 62368 Hazard-Based Safety Standard. TR-41.3 member companies Panasonic, Uniden and VTech again participated in the annual HLAA convention by demonstrating TIA-1083 compliant products and getting out the message to look for products with the TIA-1083 compliance logo on store shelves.

**ENTERPRISE AND CONSUMER SPENDING N THE UNITED STATES ($ BILLIONS)**




Source: *TIA's 2011 ICT Market Review and Forecast*

**TR-41.3, Analog and Digital Wireline Terminals,** completed its work on the revision of TIA-1083, *Telecommunications – Telephone Terminal Equipment – Handset Magnetic Measurement Procedures and Performance Requirements,* to include products with a digital interface such as VoIP telephones. The document specifies test procedures for digital phones using narrowband G.711 and wideband L16-256 codecs but allows for telephones with other codecs if they can meet the requirements of the standard. The document was published as TIA-1083-A in November.

Work continued on adding requirements for speakerphones and answering devices to the TIA-470 series of documents. TIA-470.120-C, *Telecommunications – Telephone Terminal Equipment – Transmission Requirements for Analog Speakerphones,* was published in February 2011. A draft of TIA-470.330-C, *Telecommunications – Telephone Terminal Equipment – Digital Telephone Answering Device Performance Requirements,* was submitted for ballot at year end.

Work also progressed on the "D" versions of many of the 470 subdocuments. TIA-470.000-D,

*Telecommunications – Telephone Terminal Equipment – Overview of Performance Standards for Analog Telephones,* TIA-470.210-D, *Telecommunications – Telephone Terminal Equipment – Resistance and Impedance Performance Requirements for Analog Telephones,* and TIA-470.310-D, *Telecommunications – Telephone Terminal Equipment – Cordless Telephone Range Measurement Procedures,* were all completed and published. Contributions were received for TIA-470.110-D, *Telecommunications – Telephone Terminal Equipment – Handset Acoustic Performance Requirements for Analog Terminals,* and this project should receive greater attention in 2011 now that some of the other projects have been completed.

The effort to revise the TIA-920 wideband digital transmission performance document and break it into subdocuments ran into difficulties in resolving the best way to specify signal level requirements for a plethora of wideband codecs. However, a workable solution was finally found, and the documents were approved for publication at the November meeting. TIA-920.000-A, *Telecommunications – Telephone Terminal Equipment – Overview of Acoustic Requirements for Wideband Digital Wireline Telephones,* TIA-920.110-A, *Telecommunications – Telephone Terminal Equipment – Transmission Requirements for Wideband Digital Wireline Telephones with Handsets,* and TIA-920.130-A, *Telecommunications – Telephone Terminal Equipment – Transmission Requirements for Wideband Digital Wireline Telephones with Headsets,* were published in February 2011. Work will now begin on TIA-920.120-A, *Telecommunications – Telephone Terminal Equipment – Transmission Requirements for Wideband Digital Wireline Speakerphones*.

TIA-855-A, *Telecommunications – Telephone Terminal Equipment – Stutter Dial Tone Detection Device Performance Requirements,* was submitted for default ballot at year end and should be available in the first half of 2011.

With the completion of TIA-470.120-C, TIA-470.310-D, and TIA-1083-A, the TR-41.3.9 Working Group on Cordless Telephones and the TR-41.3.10 Working Group on Analog Speakerphones were made inactive until such time as they are needed to consider revisions to these standards. The currently active TR-41.3 Working Groups are TR-41.3.2 on Stutter Dial Tone, TR-41.3.3 on Digital Transmission, TR-41.3.5 on Analog Handset Telephones, and TR-41.3.12 on Answering Devices.

**TR-41.7, Environmental and Safety Considerations,** completed drafting a proposed new standard dealing with electrical protection of home networking systems related to Smart Grid technologies. Products such as smart home appliances, TV set-top boxes, etc., generally have connections to the AC power grid and some form of communications system, each with its own ground. This raises questions about surges on the AC power line (due, for example, to nearby lightning strikes) affecting the communications side of the equipment. The document is currently undergoing comment resolution from its first ballot, with the expectation that it will require a reballot. It is to be published as TIA-1194, *Resistibility to Surges of Premises Smart Grid Equipment Connected to Either DC or 120/240 V Single Phase AC and Metallic Communications Lines,* and should be out by the third quarter of 2011.


**TIA-1083 Compliance logo**

Revision work to create TIA-631-B, *Telecommunications – Telephone Terminal Equipment – Radio Frequency Immunity Requirements,* was completed. The document was out for default ballot at the end of the year and should be published in early 2011.

A project to develop a standard on Ethernet First Mile Overvoltage Tests has gained new life and is making progress toward completion of a draft for ballot by the end of 2011. It is believed that ATIS STEP-NEP may also have an interest in this document, which will be addressed by informal liaison through common membership in both groups.

TR-41.7 continues to advise Underwriters Laboratories (UL) on matters dealing with telephone safety. Early in 2009, the subcommittee responded to questions about overcurrent protection devices by suggesting changes UL should make to its outline of investigation for these devices. Submission of these comments was followed up in 2010 with the balloting of draft TSB-187, *Application Guide for UL Subject 2564, Outline of Investiga-*

*tion for Low-Voltage Surge Withstand Telecommunications Overcurrent Protector Components*. However, the document is on hold pending UL's incorporation of the suggested changes from 2009 into its outline of investigation.

The TR-41.7.1 Working Group is in the process of reviewing material covering telecommunications issues being proposed for UL62368-1 hazard-based safety standard covering Audio/Video, Information and Communication Technology Equipment. This activity is very important, because this new standard will affect the way telecom equipment is designed, manufactured and tested in the future. Phillip Havens represents TIA on the UL/CSA Technical Harmonization Committee (THC) for this standard and takes TR-41.7's input to the THC. We expect that TIA will be requested to edit some of the material on acoustic safety to put it in the new standard's format.

**TR-41.9, Technical and Administrative Regulatory Considerations,** worked to update other documents as follow-up to its publication of TIA-968-B, *Telecommunications – Telephone Terminal Equipment – Technical Requirements for Connection of Terminal Equipment to the Telephone Network,* in August 2009. The guide to information relating to the FCC Part 68 regulatory approval process was revised and published as TSB-129-B, *Telecommunications – Telephone Terminal Equipment – U.S. Regulatory Approval Guide*. TR-41.9 also prepared a letter to the ANSI Accreditation Services program reminding them that the publication of TIA-968-B would require a revision to their ANSI-ACP-FR-026 Scope C form used for evaluating Telecommunication Certification Bodies (TCBs).

The restructuring of TIA-968-B to organize the document by equipment interface types instead of by types of network harms resulted in the need for a major revision of the TSB-31 test methods document. This work has essentially been completed, and the draft for TSB-31-D, *Telecommunications – Telephone Terminal Equipment – Rationale and Measurement Guidelines for U.S. Network Protection,* should be submitted for ballot following the February 2011 meeting of TR-41.9.

Updates were made to the list of Frequently Asked Questions (FAQs) maintained by TR-41.9. These FAQs can be found on the TR-41 page at the TIA website. The additions include a list of typical customer premises equipment that is subject to Part 68 and clarification that a receive volume control that exceeds 18 dB of gain needs only to be reset to a gain less than 18 dB when the phone goes back on hook, not all the way back to 0 dB. This clarification is helpful for products that provide two gain controls, one of which provides less than 18 dB of gain, and another that provides an extra boost that causes the gain to exceed 18 dB.

**To find out more about participating in TR-41, please contact Ronda Marrow: rmarrow@tiaonline.org, +1.703.907.7974.**

## TR-41: USER PREMISES TELECOMMUNICATIONS REQUIREMENTS

**CHAIR, TR-41: STEPHEN R. WHITESELL**
*VTech Communications*

VICE CHAIR, TR-41: VACANT

SECRETARY, TR-41: PHILLIP HAVENS
*Littelfuse, Inc.*

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**TR-41.3 Analog & Digital Wireline Terminals**
CHAIR: Al Baum, *Uniden America Corporation*
VICE CHAIR: James Bress, *AST Technology Labs, Inc.*

**TR-41.7 Environmental and Safety Considerations**
CHAIR: Randy Ivans, *Underwriters Laboratories*
VICE CHAIR: Vacant

**TR-41.9 Technical and Administrative Regulatory Considerations**
CHAIR: Vacant
AD-HOC CHAIR: Phillip Havens, *Littelfuse, Inc.*
VICE CHAIR: Vacant

### TR-41 COMMITTEE PARTICIPANTS

ADTRAN, Alcatel-Lucent, Allied Telephone and Data Corp., AST Technology Labs, Inc., Belden Networks Division, Berk-Tek, Broadcom Corporation, Cisco Systems, Inc., CML Microcircuits (USA) Inc., CommScope Network Solutions, Corning Incorporated, CSI Telecommunications, Inc., Ericsson Inc., FAL Associates, Fluke Networks, Hewlett-Packard, Industry Canada, Intel Corporation, Intertek Testing Services, Intrado, Littelfuse, Inc., LSI Corporation, Microsoft Corporation, Motorola Solutions, National Technical Systems (NTS), Nokia Siemens Networks, PacketStorm Communications, Inc., Panasonic Corp. of North America, Panduit Corporation, Plantronics, RTKL Associates Inc., SAIC, Sigma Delta Communications, Inc., Sony Wireless Tech Division, Sprint Nextel, TE Connectivity, Telchemy, Incorporated, Telcordia Technologies, Texas Instruments, Inc., The Siemon Company, U.S. Dept. of Commerce, Underwriters Laboratories Inc., Uniden America Corporation, Uniden Engineering Services, Verizon Communications, VTech Communications, and Wiltec Technologies.

# **TR-42:** Telecommunications Cabling Systems

**If you've accessed the Internet, connected to someone via a Web cam, used a VoIP phone system or downloaded digital music or video files, the documents of TR-42 helped make that possible.**

**ENGINEERING COMMITTEE TR-42 WAS FORMED IN 1999 WITH THE** re-organization of TR-41. In 2008, TR-42 merged with FO-4, the curator of the suite of fiber, fiber device, fiber cable and fiber systems standards supporting all types of fiber applications. TR-42 is responsible for developing and maintaining voluntary standards for telecommunications cabling and infrastructure in user-owned buildings such as commercial buildings, residential buildings, homes, data centers, industrial buildings and now healthcare facilities, as well as all applications of fiber optic cable and cabling systems. The committee's standards cover requirements for network architecture, copper and optical fiber cabling components (such as cables, connectors and cable assemblies), installation and field testing, in addition to premises administration, pathways, spaces, grounding and bonding to support the cabling.

TR-42 and its 12 subcommittees address the performance and requirements for telecommunications cabling (phone), data cabling (Ethernet) or both (Voice over Internet Protocol [VoIP], for example). If you've accessed the Internet, connected to someone via a Web cam, used a VoIP phone system or downloaded digital music or video files, the documents of TR-42 helped make that possible.

TR-42 is perhaps most recognized as the creator of the ANSI/TIA-568 standards, which address the performance and requirements for telecommunications cabling. Other TR-42 documents specifically address other types of customer-owned buildings, component standards for optical fiber cabling and for balanced twisted-pair copper, and supporting cabling technologies for building automation systems, wireless LANs and outside plant. The TR-42 standards also include the TIA-455 family of fiber optic test procedures (FOTPs) and the U.S. National Standards for fiber (TIA-492), fiber cable (TIA-472) and fiber systems (TIA-526 and others).

## SIGNIFICANT ACCOMPLISHMENTS

TR-42.11 adopted an IEC standard (IEC 61280-4-1; TIA-526-14-B) for testing installed multimode optical fiber cable plant, which uses encircled flux as a metric for the launch condition of test instruments and helps in the alignment of measurements between manufacturers. TR-42.12 published an optical fiber specification regarding 50/125µm OM4 fiber (TIA-492AAAD) that will be used for high bandwidth optical fiber applications. TIA-1179, *Healthcare Facility Telecommunications Infrastructure Standard*, was published, which provides cabling and infrastructure requirements for a variety of healthcare facilities. The TIA-942 standard also had an addendum published that provided additional guidelines for data center cabling (e.g., temperature and humidity, RF interference).

A tutorial (TSB-185) was developed for MICE (Mechanical, Ingress, Climatic and Chemical, and Electromagnetic), a term used to describe environments in which cabling is placed.

## 2010 OVERVIEW

TR-42 is aligning its suite of standards with ANSI/TIA-568-C.0, *Generic Telecommunications Cabling for Customer Premises*. Each of the premises standards will have allowances and exceptions to TIA-568-C.0. For example, the TIA-1005 standard on Industrial infrastructure is being revised with exceptions and allowances based on TIA-568-C.0 and with TIA-569-C for pathways and spaces. New balanced twisted-pair cabling is being pursued in TR-42.7 for higher bandwidth structured cabling solutions. Optical fiber standards are also being investigated with the development of bend-insensitive optical fibers.

## 2010 ACTIVITIES

**TR-42.1, Generic Telecommunications Cabling and Premise Cabling,** has published ANSI/TIA-568-C.0, *Generic Telecommunications Cabling for Customer Premises,* and ANSI/TIA-568-C.1, *Commercial Building Telecommunications Cabling,* setting the stage for the reorganization of the TR-42 suite of documents. Other standards recently published by the group are TIA-862-A, *Building Automation Cabling Standard for Commercial Buildings,* and ANSI/TIA-1179, *Healthcare Facility Telecommunications Infrastructure Standard.* The committee has also completed ANSI/TIA-942-2, *Addenda, Telecommunications Infrastructure Standard for Data Centers Addendum 2 – Additional Media and Guidelines for Data Centers,* and TSB-185, *Environmental Classification (MICE) Tutorial,* for the MICE Classification Tutorial. Projects are under way for a revision of the ANSI/TIA-942-A, *Telecommunications Infrastructure Standard for Data Center,* as well as for addenda to ANSI/TIA-568-C.0 and ANSI/TIA-568-C.1 reflecting the changes required due to the reorganization of the other TR-42 suite of documents as well as industry and technology advancements.

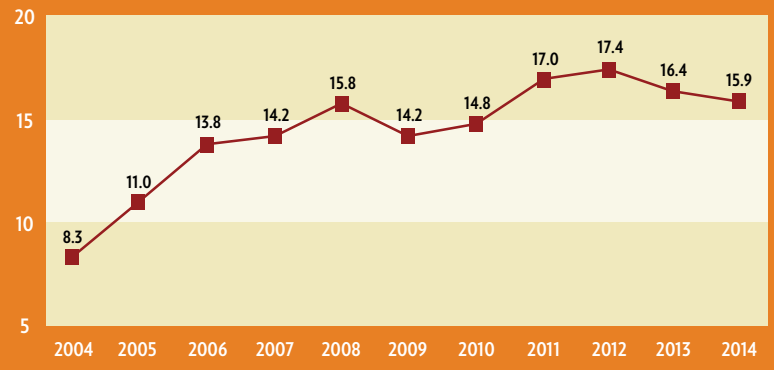
**TR-42.2, Residential Telecommunications Infrastructure,** produced the first draft of ANSI/TIA-570-C, *Residential Telecommunications Infrastructure Standard* (revision of ANSI/TIA-570-B). In this standard, voice, data and video services are correlated to grades of cabling for single-dwelling residences. The cabling infrastructure specifications are intended to include support for voice, data, video, home automation systems, environmental control, security, audio, television, sensors, alarms and intercom. This standard is intended for implementation in new construction, additions and remodeled single- and multi-dwelling residential buildings. This revision incorporates information in Addendum 1 of ANSI/TIA-570-B. The first ballot for the revision is expected in early 2011, with publication in early 2012.

**TR-42.3, Commercial Building Telecommunications Pathways and Spaces,** continued development of ANSI/TIA-569-C, *Telecommunications Pathways and Spaces*. The principal goal of this standard is to provide information to the building owners and occupants, who would otherwise live with the daily problems associated with buildings that are not properly designed and constructed to support telecommunications. A properly designed and constructed facility is adaptable to change over the life of the facility. Publication of this revision is expected in early 2012. The subcommittee is also developing addendum ANSI/TIA-568-C.1-1, *Commercial Building Telecommunications Cabling Standard, Addendum 1 Pathway and Spaces,* to include additional requirements, exceptions and allowances to TIA-569-C relevant to pathways and spaces in commercial buildings. Publication is expected in 2011.

**TR-42.4, Customer-Owned Outside Plant Telecommunications Infrastructure,** has approved publication of ANSI/TIA-758-B, *Customer-Owned Outside Plant Telecommunications Infrastructure*. The revised standard includes additional guidelines for the physical location and protection of below-ground cable plant, a revision of the references to the appropriate standards and a revision of the annex referring to cabling lengths for specific applications in ANSI/TIA-568-C.0.

**TR-42.5, Telecommunications Infrastructure Terms and Symbols,** serves as the clearinghouse for terms, symbols, units of measurement and acronyms used in the TR-42 suite of documents. This *Working Dictionary* is a living document that is updated and revised at every TR-42 meeting.

### FIBER MILES DEPLOYED IN THE UNITED STATES ($ MILLIONS)




Source: *TIA's 2011 ICT Market Review and Forecast*

**TR-42.6, Telecommunications Infrastructure and Equipment Administration,** has been revising the ANSI/TIA-606-A standard to incorporate TIA-606-A-1, *Administration Standard for Commercial Telecommunications Infrastructure Addendum 1 – Administration of Equipment Rooms and Data Center Computer Rooms,* with a high-level objective of harmonization with ISO/IEC PDTR 14763-2-1 – *Generic cabling – Implementation and operation of customer premises cabling – Identifiers within administration systems*. A key objective of this effort is to broaden the scope of ANSI/TIA-606-A so it will become a common standard for cabling administration.

**TR-42.7, Telecommunications Copper Cabling Systems,** continues to develop high-frequency copper twisted-pair cabling and component specifications and state-of-the-art measurements methods. TR-42.7 is working to finalize the proposed TIA-1183, *Test Fixtures for Balun-less Measurements of Balanced Components and Systems,* standard specifying test methods and fixtures for measurements to 1,000 MHz. This year, ISO/IEC cabling component standards harmonized their specifications with the core test procedures specified in ANSI/TIA-568-C.2. Task Groups within TR-42.7 continue to investigate and model complex coupling mechanisms such as alien crosstalk between category 6A channels due to cross-modal and common mode couplings between cables. The committee now benefits from the construction of a comprehensive mathematical model of these effects and an enhanced understanding of their impact on channel performance. TR-42.7 began discussions of higher bandwidth structured cabling solutions in the second half of 2010; including discussion of a proposal to develop a TIA category 7A specification. These discussions will be ongoing through 2011.

TR-42.7 also initiated several new projects that resulted in published standards. Coaxial cabling and component requirements are specified in the new ANSI/TIA-568-C.4, *Broadband Coaxial Cabling and Components Standard.* Information regarding sharing of applications within cables and cabling bundles is available in the newly published TSB-190, *Guidelines on Shared Pathways and Shared Sheaths*.

**TR-42.9, Industrial Telecommunications Infrastructure,** is balloting ANSI/TIA-1005-A, *Telecommunications Infrastructure Standard for Industrial Premises,* which is based on a restructuring of ANSI/TIA-1005 to harmonize with the ANSI/TIA-568-C series and ANSI/TIA-569-C ballot draft. Publication is expected in late 2011. In addition, new projects for new technologies for industrial premises, such as plastic optical fiber and higher data rates such as 1Gig, are being considered.

**TR-42.11, Optical Systems,** revised TIA-526-14-A, OFSTP-14 – *Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant,* by adopting IEC 61280-4-1 edition 2 as TIA 526-14-B. The subcommittee is currently drafting addenda to TIA-568-C.0 and C.3 to incorporate this updated method, add OM4 cabling, and add new applications support information including 24-fiber array connectivity for 100 Gigabit Ethernet.

**TR-42.12, Optical Fibers and Cables,** continues to work on a full slate of projects, many related to the FOTPs, fiber specifications, cable specifications and related documents. The subcommittee continues to lead the industry with formulation of specifications and performance criteria for bend-insensitive fibers of all types. The subcommittee is also working with the other TR-42 subcommittees and with ICEA on cabling for multi-dwelling units (MDUs), a significant emerging segment of FTTX topologies. The subcommittee continues its efforts in dissemination, discussion and coordination of information flowing to and from the related international standards bodies.

**TR-42.13, Passive Optical Devices and Fiber Optic Metrology,** continues work on specifications that give guidance on evaluating the performance parameters of optical devices. In 2011, we expect to publish new guidelines documents describing the effective use and testing of adhesive materials. Also in 2011, the focus will be on new technologies where optical devices have begun to incorporate bend-insensitive optical fiber and OM4 fiber. With the recent incorporation of TR-42.15 into this subcommittee, its scope has been expanded to include metrology and calibration standards activities.

**TR-42.16, Premises Telecommunications Bonding and Grounding,** developed and held multiple ballots of TIA-607-B, *Generic Telecommunications Grounding (Earthing) and Bonding for Customer Premises*. The purpose of TIA-607-B is to enable and encourage the planning, design and installation of telecommunications generic bonding and grounding systems within a premises with or without prior knowledge of the telecommunications systems that will subsequently be installed. While intended primarily to provide direction for the design of new buildings, this standard can be used for existing building renovation or retrofit treatment. Design requirements and choices are provided in this standard to enable the designer to make informed design decisions.

**To find out more about participating in TR-42, please contact Teesha Jenkins: tjenkins@tiaonline.org, +1.703.907.7706.**

# TR-42: TELECOMMUNICATIONS CABLING SYSTEMS

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**VICE CHAIR, TR-42: VALERIE MAGUIRE**
*The Siemon Company*

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VICE CHAIR: Glenn Sexton, *Northwest Information Services*

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VICE CHAIR: Bob Jensen, *Fluke Networks*

**TR-42.3 Commercial Building Telecommunications Pathways and Spaces**
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VICE CHAIR: Rich Jones, *Richard Jones Consulting*

**TR-42.4 Customer-Owned Outside Plant Telecommunications Infrastructure**
CHAIR: Julie Roy, *C2 Consulting*
VICE CHAIR: Jamie Silva, *Corning Cable Systems*

**TR-42.5 Telecommunications Infrastructure Terms and Symbols**
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**TR-42.11 Optical Systems**
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VICE CHAIR: Dave Mazzarese, *OFS*

**TR-42.12 Optical Fibers and Cables**
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VICE CHAIR: Brett Lane, *Panduit*

**TR-42.13 Passive Optical Devices and Fiber Optic Metrology**
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VICE CHAIR: Helmut Knehr, *Telcordia Technologies*

**TR-42.16 Premises Telecommunications Bonding and Grounding**
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# **TR-45:** Mobile and Personal Communications Systems

**ENGINEERING COMMITTEE TR-45, ESTABLISHED IN 1980, DEVELOPS PERFORMANCE,** compatibility, interoperability and service standards for mobile and personal communications systems. These standards pertain to, but are not restricted to, service information, wireless terminal equipment, wireless base station equipment, wireless switching office equipment, ancillary apparatus, auxiliary applications, internetwork and intersystem operations, interfaces and wireless packet data technologies.

**Regional regulatory activities are also a key focus of the subcommittees.**

## SIGNIFICANT ACCOMPLISHMENTS

In mid-1980, Engineering Committee TR-45 standardized the original analog standard known as IS-3, also called the AMPS Standard TIA/EIA-553 for wireless mobile communications systems. TR-45 went on to develop the first intersystem core network standard for roaming in the industry (ANSI-41, originally known as IS-41), which remains in use today. Later, TR-45 created the first Cellular Digital Standard, IS-54, the TDMA Standard — currently identified as ANSI-136. TR-45 created the IS-95 standard (TIA/EIA-95 and ANSI-95) in 1993, relying upon CDMA technology, which led to the development of CDMA High Speed Data (EV-DO) and the high-speed wireless broadband networks of today. Needless to say, TR-45 and its subcommittees have created many other standards over the years, but the four standards highlighted above are the cornerstones of much of the mobile wireless industry. These standards not only provide multiple radio interfaces but also trace the evolution from circuit-switched voice, circuit-switched data and packet data services to all IP-based radio access networks, capabilities and services.

In 1998, Committee TR-45 set in motion the creation of the Third Generation Partnership Project 2 (3GPP2), the international standards partnership program involving Association of Radio Industries and Businesses, Japan (ARIB), Telecommunications Technology Association, Korea (TTA), Telecommunications Technology Committee, Japan (TTC), China Communications Standards Association (CCSA) and TIA, established to facilitate the globalization of third-generation (3G) standards. The inaugural meeting of 3GPP2 was held in January 1999. In February 2009, the Partnership Project commemorated its 10th anniversary with a celebration hosted in Shanghai, China.

## 2010 OVERVIEW

The TR-45 Subcommittees and Ad-Hoc Groups were extremely active in 2010 developing standards (most in conjunction with 3GPP2) to support inter-technology interworking between cdma and LTE, including the development of standards for the handoff of emergency and priority calls between LTE and eHRPD, Machine-to-Machine (M2M) communications, green networks, LTE-eHRPD interworking and WiMAX-HRPD interworking core network aspects. Work continued on the evolution and integration of cdma2000® packet data standards and related features and capabilities such as MIPv6 enhancements and Multimedia Priority Services for MMD-based networks.

The suite of standards for support of femtocells for 1X and HRPD were enhanced with

cdma2000® is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OPs) of 3GPP2. Geographically (and as of the date of publication), cdma2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States.

minimum performance standards, as well as with a femtocell security framework. Moreover, TR-45 was first in the industry to publish a femtocell standard, namely, *cdma2000® Femtocell Network*.

TR-45 registered with ITU-R Working Party 5D as an Evaluation Group for IMT-Advanced Candidate Radio Interface Technologies (RITs). The TR-45 Ad-Hoc Group on International Mobile Telecommunications (AHIMT) completed its assessment and Final Report on the evaluation of candidate RITs for the terrestrial component of IMT-Advanced. TR-45 approved the Final Report submitted to the June 2010 meeting of ITU-R WP5D. In addition, the groups also continued to work on updates to the ITU-R IMT M.1457 for Release 10. Both TR-45.3 and TR-45.5 submitted updates to ITU-R Working Party 5D for the TDMA-Single Carrier (SC) Radio Interface Technology (RIT) and for the CDMA-MC RIT, respectively.

Regional regulatory activities were also a key focus of the subcommittees, with on-going work on Lawfully Authorized Electronic Surveillance (LAES) for WLAN and cdma2000® interworking, as well as new standards development, jointly with ATIS WTSC, on Commercial Mobile Alert Service (CMAS).

TR-45, through the ESN/UIMID/MEID Ad-Hoc Group (EUMAG), continues to support the industry on global numbering issues related to migration to Mobile Equipment Identifier (MEID) and E-UIM_ID. One of the primary ongoing issues addressed by the EUMAG during 2010, which will continue in 2011, is research of ESN assignments for UIM IDs derived from ESNs. The ESN Administrator and EUMAG continue to research candidate ranges for the voluntary return of ESN Manufacturer Codes by manufacturers. The EUMAG continues to partner with other industry groups such as the CDMA Development Group (CDG) in its stellar efforts to reach out and educate companies around the world on the critical need for migration to MEID.

TR-45 groups, as in the past, were actively involved in the preparation of various presentations to address the High Interest Subjects (HIS) discussed during the Global Standards Collaboration (GSC) 15 meeting held in September 2010. TR-45 subcommittees and ad hoc groups prepared presentations for TIA on five of the HIS, namely, IMT standardization, emergency communications, lawful interception, wireless access and IP over broadband access to support convergence. In addition, TR-45.5 provided input on the TIA presentations on M2M and Smart Embedded Device Communications.

Going forward, 2011 looks to be another busy year, with work on enhancements to cdma2000® 1x, HRPD and femtocells, as well as new work relative to green networks and M2M communications. TR-45 will also continue working in support of regulatory capabilities for LAES and joint work with the ATIS Wireless Technology Subcommittee (WTSC) on CMAS, as well as joint work on standards related to the Coexistence and Interference Issues in Land Mobile Systems.

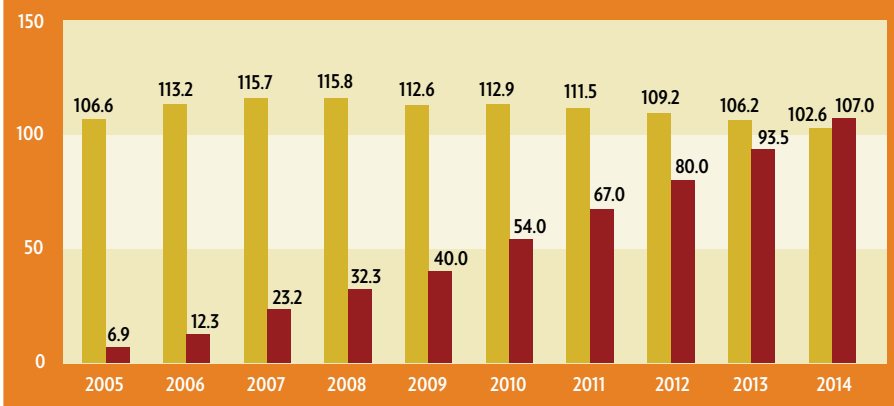
## 2010 ACTIVITIES

**TR-45.3, Time Division Digital Technology,** is authorized to develop performance, compatibility and interoperability standards for equipment that makes use of the Time Division Multiple Access (TDMA) technology for radio access in a system that supports any combination of international, public, non-public or residential mobile and personal communications.

In 2010, TR-45.3 continued to work jointly with the ATIS WTSC Radio Access Network (RAN) Subcommittee to provide updates to the ITU-R Working Party 5D on the TDMA-Single Carrier (SC) in Recommendation ITU-R on IMT-2000. TR-45.3 approved the following standards for publication to further support ANSI TIA/EIA-136-H.

- TIA/EIA-136-000-H, *TDMA Third Generation Wireless List of Parts*
- TIA/EIA-136-123-H, *TDMA Third Generation Wireless Digital Control Channel Layer 3*
- TIA/EIA-136-370-D, *TDMA Third Generation Wireless Enhanced General Packet-Data Service (EGPRS-136)*
- TIA/EIA-136-376-D, *TDMA Third Generation Wireless Enhanced General Packet-Data Service (EGPRS-136) Mobility Management (MM)*
- TIA/EIA-136-377-D, *TDMA Third*

**WIRELESS SERVICES SPENDING BY CATEGORY IN THE UNITED STATES ($ BILLIONS)**




Source: *TIA's 2011 ICT Market Review and Forecast*

*Generation Wireless EGPRS-136 Gs Interface Specifications*
- TIA/EIA-136-440-D, *TDMA Third Generation Wireless Adaptive Multi Rate (AMR) Codec*

Looking forward to 2011, Subcommittee TR-45.3 will continue to work jointly with ATIS WTSC-RAN on providing updates to IMT-2000 TDMA-SC in ITU-R M.1457.

**TR-45.4, Radio to Switching Technology,** is responsible for standards that pertain to the interface between the radio network and those network elements that comprise the infrastructure. Subcommittee TR-45.4 continues to work closely with 3GPP2 TSG-A on the development of these standards in support of services to wireless subscribers, service definitions, ancillary apparatus and auxiliary applications related to RAN.

In 2010, Subcommittee TR-45.4 approved several standards for publication, including:
- TIA-878-C-2, *High Rate Packet Data (HRPD) Interoperability Specification (IOS) Radio Access Network Interfaces with Session Control in the Access Network*
- TIA-1142-1, *Interoperability Specification (IOS) for Evolved High Rate Packet Data (eHRPD) Radio Access Network Interfaces and Interworking with Enhanced Universal Terrestrial Radio Access Network (E-UTRAN)*
- TIA-1167, *Interoperability Specification (IOS) for Femtocell Access Points*
- TIA-1180, *Interoperability Specification (IOS) for MSC Pool Network*
- TIA-1878-C-2, *High Rate Packet Data (HRPD) Interoperability Specification (IOS) Radio Access Network Interfaces with Session Control in the Packet Control Function*
- TIA-2001-D-2, *Interoperability Specification (IOS) for cdma2000® Access Network Interfaces*

Looking forward to 2011, Subcommittee TR-45.4 expects to complete standards on a third addendum to HRPD IOS revision C, a revision of the E-UTRAN-eHRPD IOS, a revision of Femtocell IOS, the second revision of CDMA Tandem Free Operation (TFO), a second addendum to 1x IOS revision E and more.

**TR-45.5, Spread Spectrum Digital Technology,** continues to be the industry leader in the publication of cdma2000® standards for Third Generation (3G) and beyond. TR-45.5, in conjunction with 3GPP2 TSG-C, continues to work on the next revision of cdma2000® Standards for Spread Spectrum Systems family of standards. Numerous cdma2000®-related standards were published (or approved for publication) in 2010. Among the published standards are:
- TIA-127-D, *Enhanced Variable Rate Codec Speech Service Options 3, 68, 70 and 73 for Wideband Spread Spectrum Digital Systems*
- TIA-127-D [SF], *Software Distribution for Enhanced Variable Rate Codec, Speech Service Options 3, 68, 70, and 73 for Wideband Spread Spectrum Digital Systems*
- TIA-856-100-C, *Overview for cdma2000® High Rate Packet Data Air Interface Specification*
- TIA-856-200-C, *Physical Layer for cdma2000® High Rate Packet Data Air Interface Specification*
- TIA-856-300-C, *Medium Access Layer for cdma2000® High Rate Packet Data Air Interface Specification*
- TIA-856-400-C, *Connection and Security Layers for cdma2000® High Rate Packet Data Air Interface Specification*
- TIA-856-500-C, *Application, Stream and Session Layers for cdma2000® High Rate Packet Data Air Interface Specification*
- TIA-916-1, *Recommended Minimum Performance Standard for Mobile Stations with Position Service*
- TIA-1058-A, *UICC-Terminal Interface Physical and Logical Characteristics for cdma2000® Spread Spectrum Systems*
- TIA-1054-B, *cdma2000® High Rate Packet Data Supplemental Services.*
- TIA-1149-1, *Commercial Mobile Alert Service (CMAS) Over cdma Systems*
- TIA-2000.1-E-1, *Introduction to cdma2000® Spread Spectrum Systems*
- TIA-2000.3-E-1, C.S0003-E, *Medium Access Control (MAC) Standard for cdma2000® Spread Spectrum Systems*
- TIA-1140, *WiMAX™ – HRPD Interworking: Air Interface Specification*
- TIA-1184, *E-UTRAN – cdma2000® 1x Connectivity and Interworking Air Interface Specification*

During 2010, TR-45.5 provided updates to the ITU-R Working Party 5D Global Core Specifications (GCS) and Roadmap, M.1580 and M.1581, as well as Recommendations M.1457-9 relative to CDMA-MC. Furthermore, the subcommittee actively participated in the joint development of Priority Action Plan 2 (PAP2) standards with the National Institute of Standards and Technology (NIST). In addition, TR-45.5 has started reviewing contributions pertaining to M2M systems and is in the process of discussing Co-Existence and Interference work with 3GPP2 TSG-C WG-3 and ATIS WTSC RAN.

**TR-45.8, Core Networks,** is focused on developing performance, compatibility and interoperability standards for equipment supporting wireless packet data that is independent from, and may be adjunct to, a system that supports any combination of public, non-public or residential mobile and personal communications. In addition, TR-45.8 develops circuit-switched core network, packet data core network and multimedia core network standards. These standards pertain to service definition and network interface standards to promote interoperability and intersystem operations, for interfaces between those network elements that comprise the infrastructure, in support of seamless service to wireless subscribers, other mobile and personal communication network systems, auxiliary systems, and to other networks. TR-45.8 is

also developing standards pertaining to regional regulatory capabilities. The subcommittee continues to work closely with 3GPP2 TSG-X and 3GPP2 TSG-S.

In 2010, Subcommittee TR-45.8 approved 12 standards for publication. Key among these were the first Femtocell standard, TIA-1165.000, *cdma2000® Femtocell Network: Overview,* updates to *E-UTRAN – eHRPD Connectivity and Interworking: Core Network Aspects,* updates to *Mobile Application Part (MAP),* updates to *WiMAX-HRPD Interworking: Core Network Aspects,* updates to *Wireless Feature Description, MIPv4 Enhancements,* two versions of *LTE-eHRPD Interworking: Core Network Aspects, Policy and Charging Control (PCC) for cdma2000® 1x and HRPD.* TIA and ATIS jointly published J-STD-102, *CMAS Federal Alert Gateway to CMSP Gateway Interface Specification.* Additionally, a report was generated on femtocell LAES.

The following System Requirements and Stage 1 standards were also approved for publication: TIA-1190, *Extended Cell High Rate Packet Data (xHRPD) SRD,* TIA-1196, *Multimedia Priority Service (MMPS) for MMD-based Networks – Stage 1 Requirements,* TIA-1191, *Callback to an Emergency Call Origination Stage 1 Requirements.* An architecture specification was approved for publication: TSB-1070, *Network Architecture Model for cdma2000® Femtocell Enabled Systems.*

Looking forward to 2011, Subcommittee TR-45.8 will continue to play a significant role in joint standards development work with ATIS to support CMAS. A new project has been initiated jointly between TIA and ATIS to address the CMAS C1 Interface. The ad hoc Lawful Intercept Group (LIG) has initiated a study on a cdma2000® Femtocell Lawful Interception Implementation Guide. The LIG has also started a joint project with ATIS WTSC and ATIS Packet Technology and Systems Committee (PTSC) on an addendum of J-STD-025-B. Additionally, TR-45.8 will continue its ongoing efforts to convert 3GPP2 core network, system requirements and network architecture specifications into TIA standards.

**TR-45, Ad Hoc Authentication Group (AHAG),** continued to develop drafts of procedures and conduct reviews of requirements related to a number of security- and authentication-related topics and issues. During 2010, the AHAG published TIA-1169, *Femtocell Security Framework.* The AHAG opened a project to revise the femtocell security framework standard and opened a project on advanced security frameworks for (e)HRPD.

During 2011, the AHAG anticipates recommending that TR-45 approve TIA-1169-A, *Femtocell Security Framework Revision A* and TIA-1208, *Advanced Security Framework for eHRPD,* for publishing.

**TR-45, Electronic Serial Number (ESN)/User Identification Module ID (UIM)/ Mobile Equipment Identity (MEID) Ad Hoc Group (EUMAG),** continues to support TIA and partnering organizations on global numbering issues and administrative initiatives. Through TIA, EUMAG has led the industry by providing recommendations on numbering topics of paramount concern to the industry, including ESN reclamation/re-use and the migration from ESN and UIMID to MEID and E-UIMID. MEID global hexadecimal administration, UIM ID administration and ESN administration are supported under the direction of the EUMAG.

One ongoing issue addressed by the EUMAG during 2010 and continuing in 2011 is research of ESN assignments for UIM IDs derived from ESNs. The ESN Administrator and EUMAG continue to research candidate ranges for the voluntarily return of ESN Manufacturer Codes from manufacturers. The resource of ESN code blocks that have never been assigned to a manufacturer has been exhausted. EUMAG facilitated

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# THE WORLDWIDE REACH

- BICSI
- IEC International Electrotechnical Commission
- ICEA Insulated Cable Engineers Association

## Fiber Optics

- User Premises Telecommunications Cabling Infrastructure (TR-42)
- Fibre Optics (IEC TC86)
- Fibre Optics US Technical Advisory Group (IEC TC86 US TAG)
- Optical Radiation Safety and Laser Equipment (IEC TC76)
- Optical Radiation Safety and Laser Equipment US Technical Advisory Group (IEC TC76 US TAG)


## Mobile Communications

- Mobile and Personal Private Radio Standards (TR-8)
- Point-to-Point Communications Systems (TR-14)
- Mobile and Personal Communications Systems (TR-45)
- Terrestrial Mobile Multimedia Multicast (TR-47)
- Third Generation Partnership Project 2 (3GPP2) Secretariat and Partner

- APCO Association of Public-Safety Communications Officials International
- ARIB Association of Radio Industries and Businesses – Japan
- ATIS Alliance for Telecommunications Industry Solutions
- CCSA China Communications Standards Association – China
- CDG CDMA Development Group
- DVB Digital Video Broadcasting Project
- ETSI European Telecommunications Standards Institute
- FLO (Forward Link Only) Forum
- MEF Metro Ethernet Forum
- TTA Telecommunications Technology Association – Korea
- TTC Telecommunications Technology Committee – Japan

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TIA MANAGED Committees

OTHER ORGANIZATIONS

# OF TIA STANDARDS

- ANSI — American National Standards Institute
- SES — Standards Engineering Society
- IEC USNC IEC — United States National Committee
- INCITS — International Committee for Information Technology Standards
- ECCB — Electronics Components Certification Board

- ETSI European Telecommunications Standards Institute

## Satellite

- Satellite Equipment and Systems (TR-34)

## User Premises and Components

- Multi-Media Access, Protocols and Interfaces (TR-30)
- User Premises Telecommunications Requirements (TR-41)
- User Premises Telecommunications Cabling Infrastructure (TR-42)
- Cables, Wires, Waveguides, R.F. Connectors, and Accessories for Communication and Signaling (IEC TC46)
- Cables, Wires, Waveguides, R.F. Connectors, and Accessories for Communication and Signaling US Technical Advisory Group (IEC TC46 US TAG)
- Interconnection of Information Technology Equipment (JTC1/SC25)

- ACTA Administrative Council for Terminal Attachments
- ATIS Alliance for Telecommunications Industry Solutions
- BICSI
- ETSI European Telecommunications Standards Institute
- ISO International Organization for Standardization
- IEC International Electrotechnical Commission
- ITU International Telecommunication Union

## Device-to-Device Communications

- Vehicular Telematics (TR-48)
- ISO Intelligent Transport Systems US Technical Advisory Group (ISO TC204 USTAG)
- ISO Intelligent Transport Systems Secretariat (ISO TC204)
- Healthcare Information Communications Technology (TR-49)
- Smart Device Communications (TR-50)
- Smart Utility Networks (TR-51)

- ISO - International Organization for Standardization
- American National Standards Institute (ANSI) - Health IT Standards Panel (HITSP)

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publication of the updated ESN Manufacturers Code Assignment Guidelines and Procedures, which promotes the use of particular identified codes for ESN assignments, and June 30, 2010, was the last date for receipt of an ESN MFR Code Block request (per ESN Guidelines Version 2.1: Section 5.13).

The EUMAG continues to reach out and work closely with related industry fora. Under the direction of TR-45, EUMAG sustains a working relationship with 3GPP2 on MEID, expanded UIM ID and other related topics. Additionally, the work of the EUMAG includes maintaining the editorship of the TIA ESN Assignment Guidelines & Procedures, the 3GPP2 SC.R4001-0/TIA Global Wireless Equipment Numbering Admin Procedures, 3GPP2 SC.R4002-0/TIA GHA (Global Hexadecimal Administrator) Assignment Guidelines and Procedures for MEID and SF_EUIMID, and of the 3GPP2 SC.R4004-0 User Identification Module ID Manufacturer's Code Assignment Guidelines and Procedures.

The first Global Wireless Equipment Identifier Numbering Resources & Administration Joint Experts Meeting (JEM) was held in September 2009. JEM sessions were also held in 2010 and continue in 2011 to address Global Wireless Equipment Numbering Identifier Resources and Global Administration coordination moderated by the EUMAG Chair and hosted by the TIA GHA (MEID) Admin-

**To find out more about participating in TR-45, please contact Teesha Jenkins: tjenkins@tiaonline.org, +1.703.907.7706.**

## TR-45: MOBILE AND PERSONAL COMMUNICATIONS SYSTEMS

**TR-45 CHAIR: JANE BROWNLEY**
*Alcatel-Lucent*

TR-45 VICE CHAIR: GERARD FLYNN
*Verizon Wireless*

TR-45 SECRETARY: VICTORIA MITCHELL
*TIA*

### SUBCOMMITTEES AND AD HOC GROUPS

**TR-45.3 Time Division Digital Technology**
CHAIR: Peter Musgrove, *AT&T*

**TR-45.4 Radio to Switching Technology**
CHAIR: David Ott, *Qualcomm Inc.*

**TR-45.5 Spread Spectrum Digital Technology**
CHAIR: Orlett Pearson, *Alcatel-Lucent*

**TR-45.8 Core Networks**
CHAIR: Betsy Covell, *Alcatel-Lucent*

**TR-45 Ad-Hoc Authentication Group (AHAG)**
CHAIR: Frank Quick, *Qualcomm Inc.*

**TR-45 Ad-Hoc on UIM/ESN/MEID (EUMAG)**
CHAIR: Gary Pellegrino, *CommFlow Resources*

**TR-45 Ad-Hoc on Electronic Media Documentation (AHEM)**
CHAIR: Peter Nurse, *Sigma Delta Communications*

**TR-45 Ad-Hoc on International Mobile Telecommunications (AHIMT)**
CHAIR: Peter Nurse, *Sigma Delta Communications*

### TR-45 COMPANY PARTICIPANTS

Aeroflex, Agilent Technologies, Inc., AirCell, LLC, Airvana, Inc., Alcatel-Lucent, Apple, AT&T, Bell Mobility, Bridgewater Systems Inc., CDMA Development Group, Cisco Systems, Inc., CML Microcircuits (USA) Inc., CommFlow Resources Inc., Comprion GmbH, Converlogic, CSI Telecommunications, Inc., Defense Information Systems Agency, Dolby Laboratories Inc., Ericsson Inc., FAL Associates, FTR&D LLC, Fujitsu Network Communications, Gemalto Inc., Hitachi Telecom (USA) Inc., Hughes Network Systems, LLC, Intel Corporation, Intellon, Intrado, IP Fabrics, LG InfoComm U.S.A., Inc., Lockheed Martin Corporation, Motorola Mobility Inc, Motorola Solutions, Movius Interactive Corporation, Nokia Inc., Nokia Siemens Networks, Panasonic Corp. of North America, Qualcomm Inc., Research In Motion, Rogers Communications, Rohde & Schwarz, Inc., RTKL Associates Inc., SAIC, Samsung Electronics, Samsung Telecom. America, Sierra Wireless America, Inc., Sigma Delta Communications, Inc., Spirent Communications, Sprint Nextel, SS8 Networks, Inc., Tatara Systems, Telcordia Technologies, TeleCommunication Systems, Inc., Texas Instruments, Inc., US Cellular, Verizon Communications, VIA Telecom, WireFreeComm Inc., and ZTE USA Inc.

istrator and the GSMA GDA (IMEI) Administrator.

As a leader in the industry, the EUMAG continues to educate through outreach awareness programs, working closely with the CDMA Development Group (CDG) in the management of the ESN exhaust timeline and transition to MEID. In addition to ongoing ESN Administrator visits with mobile station manufacturers, TIA and CDG made visits in 2010 and will continue in 2011 to many infrastructure vendors and carriers to help the industry understand MEID and E-UIMID implementation urgency and to assist in any issues that may exist.

TIA has posted ESN and MEID resource documents developed by the EUMAG and related information on the TIA website. A list of Frequently Asked Questions (FAQs) and the milestone timelines for ESN migration to MEID, as well as related links, are available on the website to raise awareness of ESN exhaust and the need to continue expedited migration to MEIDs.

MEID assignments have been ongoing since January 2006. MEID and E-UIMID system implementations continue industry-wide.

**TR-45, Ad Hoc Group on Electronic Media Documentation (AHEM),** continues to recommend the use of electronic methods to support the work of Committee TR-45. In 2011, AHEM plans to champion the use of software (e-tools) to support collaborative development of standards.

**TR-45, Ad Hoc Group on International Mobile Telecommunications (AHIMT),** at the direction of Committee TR-45, registered as an independent evaluation group of the proposals for candidate radio interface technologies for the terrestrial components of radio interface(s) for IMT-Advanced. In 2010, the work of the AHIMT (via face-to-face meetings, supplemented by discussion on its email reflector) was based on input contributions from member organizations, and the output of the AHIMT was approved by Committee TR-45 prior to transmittal to external organizations. The AHIMT conducted its assessment of the candidate technologies utilizing the ITU-R evaluation guidelines. TR-45 approved an Interim Report on the activities of AHIMT to the February 2010 meeting of the ITU-R WP5D. The AHIMT completed its assessment and Final Report on the evaluation of candidate radio interface technologies for the terrestrial component of IMT-Advanced. It was reported that the TIA TR-45 Evaluation Group had discovered no cases where either IMT ADV/4 (IEEE 802.16m) or IMT ADV/8 (3GPP LTE-Advanced) failed to meet the minimum requirements. Committee TR-45 approved the Final Report that was submitted to the June 2010 meeting of ITU-R WP5D.

# **TR-47:** Terrestrial and Non-Terrestrial Mobile Multimedia Multicast (TM$^3$)

**These standards are key enablers for the convergence of television and mobile phones.**

**SINCE 2005, ENGINEERING COMMITTEE TR-47 HAS BEEN RESPONSIBLE FOR THE** development and maintenance of voluntary downlink standards for terrestrial and non-terrestrial mobile multimedia multicast systems. These standards are intended to be employed by users and suppliers to promote compatible and interoperable systems to support multicast audio, video and data requirements for a wide range of commercial and public services.

The Engineering Committee and its two subcommittees focus on standards for radio interfaces, testing methodologies, performance/service and reliability/control standards, and equipment design/implementation guides as they relate to terrestrial and non-terrestrial mobile multimedia multicast.

## SIGNIFICANT ACCOMPLISHMENTS

Within a year of the launch of TR-47 and its subcommittees, the first standards to support terrestrial mobile multimedia multicast systems were published. These standards (TIA-1099, *Forward Link Only Air Interface Specification for Terrestrial Mobile Multimedia Multicast,* TIA-1102, *Minimum Performance Specification for Terrestrial Mobile Multimedia Multicast Forward Link Only Devices,* TIA-1103, *Minimum Performance Specification for Terrestrial Mobile Multimedia Multicast Forward Link Only Transmission,* and TIA-1105, *Terrestrial Mobile Multicast Based on Digital Video Broadcasting for Handheld Devices Systems*, among others developed by TR-47, are key enablers for the convergence of television and mobile phones and have resulted in a wireless application known as Mobile TV, which offers high-quality TV services and other multimedia streams over cellular phones.

In addition to those accomplishments, the committee and its two subcommittees completed an Emergency Alerts System requirements review and an initial document for the committee's use and sharing with other organizations.

## 2010 OVERVIEW

Significant work was accomplished by the committee to support growing deployments of mobile multimedia multicast systems. Committee participants continued their steady work pace building on past accomplishments.

With the high level of global cooperation required to support growing market needs, the committee continues to interact with a number of external organizations including the Association of Radio Industries and Businesses (ARIB), European Telecommunications Standards Institute (ETSI), 3rd Generation Partnership Project (3GPP), Digital Video Broadcasting (DVB) Project and the FLO Forum (Forward Link Only Forum).

## 2010 ACTIVITIES

**TR-47.1, TM$^3$ Based on Forward Link Only Technology,** is responsible for the development and maintenance of downlink standards for a subclass of terrestrial and non-terrestrial mobile multimedia multicast systems.

The subclass is characterized by the combination of the following features, among others: purpose-built; high spectral efficiency; multiple simultaneous services; layered modulation and service support; advanced coding; customized transport methods, statistical multiplexing of

variable-rate services; high-quality audio, video and data; and content protection. The subclass provides multiple coverage areas (wide and local) within a single radio frequency (RF) channel, and supports different quality of service (QoS) for different services within a single RF channel and a single service. In addition, it promotes fast switching time between services, minimized receiver power consumption without sacrificing the time-diversity performance or the speed of service switching regardless of the service rate, and a deterministic frame structure based on a time synchronizing signal such as a Global Positioning System (GPS).

These standards are intended to be employed by users and suppliers to promote compatible and interoperable systems to support multicast audio, video and data requirements for a wide range of commercial and public services.

This subcommittee developed and ratified four standards published in 2010:

- TIA-1103 Rev. B, *Minimum Performance Specification for Terrestrial Mobile Multimedia Multicast Forward Link Only Transmitters*
- TIA-1181, *Forward Link Only Messaging Transport Specification – Support for Emergency Alert Service for Forward Link Only Terrestrial and Non-terrestrial Mobile Multimedia Multicast Systems*
- TIA-1204, *Band Class Specification for Terrestrial Mobile Multimedia Multicast Forward Link Only Transmitters*
- TIA- 1205, *Forward Link Only System Information Delivery Layer Specification*

The subcommittee members anticipate additional new projects for 2011.

**TR-47.2, TM³ Based on Digital Video Broadcasting for Handheld (DVB-H) Technology,** is responsible for the development and maintenance of downlink standards for a subclass of terrestrial and non-terrestrial mobile multimedia multicast systems based on DVB-H devices technology.

TR-47.2 specifications encompass, but are not limited to, transmission systems, implementation guides, validation of transmission systems, and appropriate ETSI documents related to DVB-H devices. These standards are intended to be employed by users and suppliers to promote compatible and interoperable systems to support multicast audio, video and data requirements for a wide range of commercial and public services.

TR-47.2 completed an Emergency Alerts System requirements document for the subcommittee's internal use and shared it with other external organizations. A number of liaisons continue with other organizations relating to potential new work.

**To find out more about participating in TR-47, please contact Teesha Jenkins: tjenkins@tiaonline.org, +1.703.907.7706.**

## TR-47: TERRESTRIAL AND NON-TERRESTRIAL MOBILE MULTIMEDIA MULTICAST (TM³)

**CHAIR, TR-47: JERRY UPTON**
*Jerry Upton Consulting*

**VICE CHAIR, TR-47: KEN BIHOLAR**
*Alcatel-Lucent*

### SUBCOMMITTEES

**TR-47.10 TM³ Based on Forward Link Only Technology**
CHAIR: Carl Stevenson, *WK3C Wireless LLC*

**TR-47.2 TM³ Based on DVB-H Technology**
CHAIR: Ken Biholar, *Alcatel-Lucent*

### TR-47 COMMITTEE PARTICIPANTS

Alcatel-Lucent, Corning Incorporated, Dolby Laboratories Inc., Electronics Research, Inc., Ericsson Inc., FLO Forum, FTR&D LLC, Harris Corporation, Intel Corporation, Intellon, J. Upton Consulting, LG InfoComm U.S.A., Inc., LightSquared, Motorola Solutions, Nokia Inc., Nokia Siemens Networks, Panduit Corporation, Qualcomm Inc., Rogers Communications, Rohde & Schwarz, Inc., SAIC, Samsung Telecom. America, Sprint Nextel, Texas Instruments, Inc., Verizon Communications, and WK3C Wireless LLC.

# TR-48: Vehicular Telematics

**SINCE 2007, ENGINEERING COMMITTEE TR-48 HAS BEEN RESPONSIBLE FOR THE** development and maintenance of voluntary standards relating to vehicular telematics equipment and services.

Telematics Service Providers (TSPs) have the ability to transmit vital automobile crash information to emergency responders immediately following an incident. This data has the potential to assist in the prediction and identification of critical injuries, as well as to provide information for victim extrication efforts. Additionally, crash data will allow emergency responders to more accurately predict what rescue and medical equipment will be needed at the scene.

TR-48 recognizes that the delivery of consumer (e.g., crash) and commercial (e.g., trucking, and specifically hazmat) telematics data to Intelligent Transport Systems (ITS) and emergency response agencies in real time would enhance public safety. When available on a timely basis to transportation and other agencies, such data can save the lives of victims and responders, help alleviate congestion and reduce the number of ensuing additional incidents. The key is data interoperability with all the organizations affected by and responding to the emergency, not just those in transportation.

**TSPs have the ability to transmit vital automobile crash information to emergency responders immediately following an accident.**

## SIGNIFICANT ACCOMPLISHMENTS

TR-48 began work on a standard for *Emergency Information Delivery Protocol,* to be published as TIA-1153. The project goal is to enable sharing of incident data and information among TSPs and other appropriate organizations.

Although The ComCARE Alliance has developed the general approach to delivering consumer telematics data, the issue is whether this approach will work for other incident or sensor types. To cover the near-term situation that most emergency agencies do not have interfaces to XML standards, an emergency incident website could be developed to display a wide variety of incident data. The project scope is twofold:

- Conduct research on related telematics emergency information delivery efforts including, but not limited to, ComCARE Vehicular Emergency Data Set (VEDS), Healthcare Information Technology Standards Panel (HITSP) Emergency Responder Electronic Health Record (ER-EHR), IEEE Vehicular Technology Society/Intelligent Transportation Systems (VTS/ITS) Common Incident Management Message Sets, Society of Automotive Engineers Location Referencing Message Specification (LRMS) and Message Set Dictionary, and OASIS Common Alerting Protocol (CAP) and Emergency Data Exchange Language (EDXL).
- Determine feasibility of and describe the architecture, protocol, core services middleware, interfaces, registration and policies for a common middleware protocol for emergency information exchange.

## 2010 OVERVIEW

Information from telematics service providers and commercial fleet tracking companies is generally not available to the emergency response community, despite the providers' ability to provide critical information such as crash data, vehicle location and, in the case of trucks, cargo content. Rapid identification of substances posing potential public health and environmental threats would allow the proper agencies to be alerted immediately in case of vehicle collision or spill. Evacuation orders or emergency instructions could be rapidly disseminated via alerting systems. Commercial drivers and the general public could additionally benefit from more timely traffic emergency situation alerts, rather than the current, often multi-step, generally voice, and cumbersome notification of ITS systems by public safety organizations.

Over the past several years, ComCARE and

its members have designed an approach and architecture that would radically improve this information flow, linking automotive and trucking entities on the one hand with emergency response and traffic agencies on the other. Most of this effort has focused on consumer telematics. The issue at hand is whether the same approach and architecture can be used for trucking data and other mobile sensor information. Similarly, can it be used in reverse for standards-based emergency alerting such as weather, terrorist, Amber and traffic alerts? The committee believes it can serve both needs and is economically and architecturally sound. However, the issue has not been subjected to intensive discussions beyond consumer telematics.

Detailed requirements work indicates that the solution needs to be agnostic as to legacy agency IT applications and local/regional networks. Most emergency agencies today do not have the ability to accept data from external sources; they do not yet have interfaces to XML standards. However, nearly all do have Internet connections, or could get them easily. An interim step to allow rapid sharing of such data cheaply would be to provide the data using the messaging standards indicated above to an "emergency incident website" and display them on an electronic map. This would be available to all emergency response agencies. Agency subscribers would be able to see only their own area and adjacent jurisdictions. Over time, registration for the website could become registration for the core services described above or governed by them.

## 2010 ACTIVITIES

TR-48 held monthly teleconferences and issued meeting reports in 2010. The activities of the committee focus on the development of TIA-1153, *Emergency Information Delivery Protocol*, and attendance at conferences and events where issues directly related to telematics are discussed.

Kevin Lu, former TR-48 Chair, participated in the SAE International's DSRC (Dedicated Short Range Communication) Technical Committee, which sets the SAE Standard J2735_200911 on DSRC Message Set Dictionary. This SAE Standard specifies a message set and its data frames and data elements, specifically for use by applications intended to utilize the 5.9 GHz Dedicated Short Range Communications for Wireless Access in Vehicular Environments (DSRC/WAVE)

communications systems. Although the scope of this standard is focused on DSRC, this message set and its data frames and data elements have been designed, to the extent possible, to also be of potential use for applications that may be deployed in conjunction with other wireless communications technologies.

Dave Kraft, TR-48 Vice Chair, has participated in the American Trucking Associations (ATA) Technology and Maintenance Council (TMC) and the Wireless Roadside Inspection (WRI) Program conducted by the Federal Motor Carrier Safety Administration (FMCSA) and the National Transportation Research Center Inc. (NTRCI). The focus is on improving motor carrier safety through wireless roadside inspections that use real-time data to establish the identities of commercial motor vehicles, carriers and drivers and to electronically examine driver status and vehicle condition. These data will be collected from the vehicle and provided wirelessly, either from the vehicle or from the carrier's operations center. One of the WRI Pilot Tests will utilize Commercial Mobile Radio Systems (CMRS) to transmit Safety Data Message Sets (SDMS), including data from Electronic On-Board Recorders (EOBRs).

TR-48 developed content for a discussion on "ITS High Interest Subjects (HIS) – ITS" which was discussed at the 15th Global Standards Collaboration (GSC-15) meeting in Beijing from August 30 to September 2, 2010.

A TR-48 member represented TIA TR-48 at the Second International Summit on the State of the Connected Vehicle hosted by the Connected Vehicle Trade Association (CVTA) and the Michigan Department of Transportation in conjunction with SAE International on September 29 and 30, 2010, in Troy, Mich.

Kevin Lu participated in the closing panel of the ETSI Business Innovation Summit, which focused on how ICT could revolutionize the world of transport, held in London October 5–6, 2010.

Telcordia and the Institute for Information Industry (III) in Taiwan made a joint contribution entitled "Sharing Incident Information Through Multi-mode On-Board Unit (OBU)," which was presented to TR-48 for further development of TIA-1153, *Emergency Information Delivery Protocol*.

In addition, TR-48 tracks the development of other vehicular telematics standards including the National Transportation Communications for ITS Protocol (NTCIP) — a joint standardization project of American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE), and National Electrical Manufacturers Association (NEMA); IEEE P1609 DSRC Working Group; SAE DSRC Technical Committee; ISO/TC204 Subcommittees/Working Groups (WG) such as WG1 (Architecture), WG3 (TICS Database Technology), WG7 (General Fleet Management and Commercial/Freight), WG16 (Wide Area Communications/ Protocols and Interfaces), WG17 (Nomadic Devices in ITS Systems), and WG18 (Cooperative Systems); the Vehicle Gateway Platforms (VGP) Ad Hoc Group of the ITU-T Study Group 16 (SG 16); and related activities of the GENIVI Alliance, the ng Connect Program, the ITS America's North American Traffic Working Group (NATWG), and the National Information Exchange Model (NIEM) and Unified Incident Command and Decision Support (UICDS).

**To find out more about participating in TR-48, please contact Ronda Marrow: rmarrow@tiaonline.org, +1.703.907.7974.**

## TR-48: VEHICULAR TELEMATICS

**CHAIR, TR-48: KEVIN LU**
*Telcordia Technologies, Inc.*

**VICE CHAIR, TR-48: DAVE KRAFT**
*Qualcomm, Inc.*

### TR-48 COMMITTEE PARTICIPANTS

ATX, CVTA, Ericsson, Huawei, OnStar, QNX, Qualcomm, Sigma Delta Comm., Telcordia, Ygomi

# **TR-49:** Healthcare ICT

**ENGINEERING COMMITTEE TR-49 WAS CREATED IN 2007 AND IS RESPONSIBLE** for the development and maintenance of standards for healthcare ICT applications that involve medical devices, network infrastructure, applications and operations support.

## SIGNIFICANT ACCOMPLISHMENTS

In 2009, the TR-49 leadership along with TIA established the TIA Health ICT Forum. The goal of this forum is to broaden the discussion beyond standards development and to look at health ICT opportunities, requirements and challenges. The forum identified the following potential areas of interest:

- The creation of a health records/standards template. It is noted that other bodies are looking at this, but there are still issues of how to use defined formats.
- The delivery of information and issues of security, authentication, and authorization.
- The use of clearinghouses to take care of privacy issues and authorize access to information. Is this of value to industry and are there certain interfaces to be standardized?
- The use of sensors/monitors to gather medical information. These devices can be connected to cell phones and used to collect information.
- Transmission to monitoring centers and healthcare facilities and the development of ways to communicate between sensors.

## 2010 OVERVIEW

The committee started the development and production of two deliverables. The first is a Telecommunications System Bulletin (TSB) outlining the inappropriateness of SMS as a vehicle for transmitting health consent directives. The second is a TSB, or standard, noting appropriate alternatives to SMS for transmitting health consent directives.

**The committee proposed that one of its work areas be standardization of services and architectures to support health information technology on a future service-enabled network for healthcare.**

Due to the complexity of both the technical aspects and the market ecosystem surrounding tele-health, the committee has continued to use the TIA Health ICT Forum to develop new concepts and initiatives for possible standardization.

## 2010 ACTIVITIES

The committee met several times during the year and examined a proposed project for managing consent directives over mobile networks. The discussion was in line with a presentation made by Kaiser Permanente at the March 2010 meeting. It was noted that the proposed work item makes use of mobile devices to transmit consent directives via SMS and other means. Experts from Alcatel-Lucent, Sigma Delta Communications and AT&T were invited to comment. In the ensuing discussion, the following points were made: 1) Healthcare applications require a high degree of reliability, and SMS was not inherently designed to be reliable; 2) the networks the message travels over are inherently constrained and payload size is limited; 3) SMS is a 160-character payload. Any additional security features built-in will need to be accommodated within these size limitations, reducing the space available for the message itself; 4) SMS cannot be "fixed." It is performing according to its original design. It was never designed to be a robust, error-free mechanism. In addition to these issues, industry members recently alerted the FCC that SMS would not be suitable as a nationwide alert system for the same reasons identified here.

Given that industry may be moving in the direction of using SMS, a proposal was made for the committee to develop a TSB to raise the appropriate flag concerning the inappropriateness of the use of SMS for the applications described herein.

B System Compliant was tasked with leading the TSB development effort, and AT&T noted a contribution it had provided to TIA in the past identifying the limitations of SMS and recommended that this be used as a basis for the TSB. It was agreed that the committee will set about developing and producing two deliverables. The first is a TSB outlining the inappropriateness of SMS as a vehicle for transmitting health consent directives. The second is a TSB, or standard, noting appropriate alternatives to SMS for transmitting health consent directives.

During the July meeting, a high-level outline of the proposed TSB was presented and discussed by committee members. Diversinet, AT&T and Sigma Delta Communications contributed to the discussion. It was agreed that a draft document will be prepared for the next meeting.

Members will continue to support the TIA Health ICT Forum to explore market needs as Health ICT continues to evolve in anticipation of a major paradigm shift in the market.

**To find out more about participating in TR-49, please contact Ronda Marrow: rmarrow@tiaonline.org, +1.703.907.7974.**

## TR-49: HEALTHCARE ICT

**CHAIR, TR-49: SHOSHANA LOEB**
*Telcordia Technologies, Inc.*

### TR-49 COMMITTEE PARTICIPANTS

AT&T, B System Compliant, Belden Networks Division, CommScope Network Solutions, Diversinet, Fluke Networks, Harris Corporation, IHS, Motorola Solutions, Panasonic Corp. of North America, Panduit Corporation, Qualcomm Inc., Sigma Delta Communications, Inc., TE Connectivity, Telcordia Technologies.

# **TIA TR-50:** Smart Device Communications

**SINCE 2010, ENGINEERING COMMITTEE TR-50 HAS BEEN RESPONSIBLE FOR** the development and maintenance of access-agnostic interface standards for monitoring and bi-directional communication of events and information among smart devices and other devices, applications or networks.

**TR-50's goal is to develop a smart device communications framework that can operate over different underlying transport networks.**

## 2010 OVERVIEW

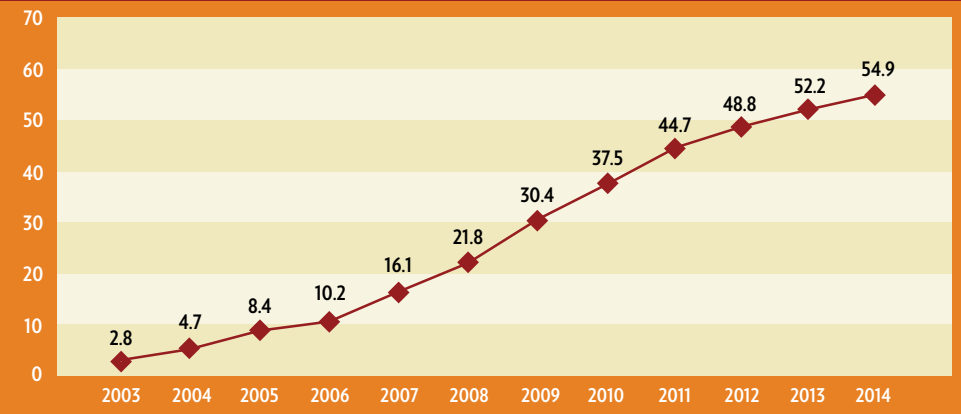
TR-50's goal is to develop a smart device communications framework that can operate over different underlying transport networks, such as wireless and wired, that can be adapted to a given transport network by means of an adaptation/convergence layer. To that end, TR-50 worked actively in 2010 to define the requirements and reference architecture that will be the framework to support a ubiquitous protocol for communicating with smart devices used in industries such as manufacturing, medical, building, automation/home automation, transportation, entertainment, communication, semiconductor and energy distribution.

Realizing that security represents one of the highest-priority issues facing smart-device communications, TR-50 created an Ad Hoc Security Group in February 2011. One of the goals of this group is to review and approve all ballots by TR-50 and its Subcommittees to ensure that any architecture, protocols or specifications meet the requirements for a secure solution for smart-device communications.

## 2010 ACTIVITIES

**TR-50.1, Smart Device Communications, Requirements and Architecture,** worked aggressively throughout 2010 to define the terminology and reference architecture that will support Smart-Device Communications. This work will result in the completion of the group's first

**SMARTPHONES AS A SHARE OF WIRELESS DEVICE UNIT SALES IN THE UNITED STATES (PERCENT)**




Source: *TIA's 2011 ICT Market Review and Forecast*

**To find out more about participating in TR-50, please contact Ronda Marrow: rmarrow@tiaonline.org, +1.703.907.7974.**

## TR-50: SMART DEVICE COMMUNICATIONS

**CHAIR, TR-50: JEFFREY SMITH**
*Numerex*

**VICE CHAIR, TR-50: JIM WERT**
*ILS Technology*

### SUBCOMMITTEE

**TR 50.1, Smart Device Communications; Requirements and Architecture**
CHAIR: Peter Nurse, *Sigma Delta Communications*
VICE CHAIR: Mitch Tseng, *Huawei*

**Ad-Hoc Security Group**
CHAIR: Chuck Bokath, *Georgia Tech Research Institute*
VICE CHAIR: Mihai Voicu, *ILS Technology*

### TR-50 COMMITTEE PARTICIPANTS

Alcatel-Lucent, Broadwing, Inc., Ericsson Inc., Flarion Technologies, GEC-Marconi Hazeltine Corp., Huawei Technologies USA, ILS Technology, Mitsubishi Electric Automation, Neustar., Nokia Inc., Numerex Corp., Sigma Delta Communications, Inc., Sprint Nextel, TE Connectivity, VIA Telecom, WireFreeComm Inc.

document in the latter part of 2011.

This document is a member of a multi-part standard, which, when taken in total, defines the requirements for communication pertaining to the access-agnostic (e.g., PHY and MAC) monitoring and bi-directional communication of events and information between smart devices, applications or networks.

The document provides reference architecture, describing functional elements and their interconnection. The annexes of the document provide identified use cases and demonstrate the applicability of the reference architecture to the support of those use cases.

TIA TR-50 is collaborating with ETSI TC M2M to explore commonalities between the standards being developed by both groups, The Chair of TR-50 will be convening the first meeting of the GSC M2M Standardization Task Force (MSTF), in Dallas, Texas, on May 18, 2011, during TIA 2011.

NEW

# **TIA TR-51:** Smart Utility Networks

**TIA'S NEWEST ENGINEERING COMMITTEE, TR-51, SMART UTILITY NETWORKS,** was established in February 2011 to develop and maintain air interface, network and conformance standards in support of Smart Utility Networks. The committee will focus on air interface and network standards with wireless mesh network topology, optimized for Smart Utility Network applications.

Smart Utility Networks technology focuses on efficient access technology with a mesh network topography optimized for Smart Utility applications. The Smart Utility Networks standards are intended to provide utility companies with another tool to improve services to their customers. During the TR-51 standards process, TIA will work to incorporate the best of the applicable existing standards to develop an integrated multi-layer standard (covering layers 1 through 4).

Smart Utility Networks standards are intended to provide solutions for two-way data transmission between devices and the back-office systems of the utility provider, with a focus on improving services. The committee will develop standards for OSI layers 1 through 4, leveraging applicable existing standards.

The committee's scope was developed at TR-51's inaugural meeting in Atlanta on Feb. 15 and approved by the TIA Technical Committee. The scope reflects the broad interest in Smart Utility Networks.

Mike Lynch of MJ Lynch & Associates, LLC, was the facilitator for the newly-created committee's first meetings. Lynch has extensive spectrum regulatory experience, has coordinated international teams to make spectrum available for new services, and has domestic and international expertise in establishing and managing corporate spectrum management policies. He previously chaired TIA's Spectrum Policy Working Group.

At TR-51's second meeting, April 12 in San Francisco, elections were held for committee chairman and co-vice chairmen. Mike Lynch was elected Chair. The co-vice chairs are Hiroshi Harada of NICT and Phil Beecher of Beecher Communications Consultants, Ltd.

Participants at TR-51's inaugural meeting included representatives from Alcatel-Lucent, Analog Devices (ADI), Blindcreek Associates, Discrete Time Communications UK Ltd., EADS, Ericsson, Huawei, MJ Lynch & Associates, Nokia Siemens Networks, Telecom Policy Solutions, Relay Services, Sigma Delta Communications, Silver Spring Networks, Smart Utility Networks Alliance, TE Connectivity (formerly Tyco Electronics) and WireFreeCom, Inc.

TR-51 will work with national standards bodies and other appropriate organizations to avoid duplication of work and to foster collaboration among organizations addressing various aspects of smart device communication networks. TR-51 has designated liaisons to ITU, SGIP, ETSI M2M and TR-50.

**To find out more about participating in TR-51, please contact Ronda Marrow: rmarrow@tiaonline.org, +1.703.907.7974.**

## **TR-51:** SMART UTILITY NETWORKS

**CHAIR, TR-51: MIKE LYNCH**
*MJ Lynch & Associates, LLC*

**CO-VICE CHAIR: PHIL BEECHER**
*Beecher Communications Consultants, Ltd.*

**CO-VICE CHAIR: HIROSHI HARADA**
*NICT*

# TIA Global Involvement

In addition to facilitating the development of standards in the United States, TIA promotes the use of U.S. standards internationally and advocates U.S. policy and technical positions in international and regional standards organizations. TIA is active in numerous international standards development activities through participation in the International Electrotechnical Commission (IEC), International Organization for Standardization (ISO) and the International Telecommunication Union (ITU).

U.S. positions on technical — and certain policy — issues under consideration within the IEC and ISO technical committee structures are developed by approved U.S. Technical Advisory Groups (TAGs) and forwarded to the international bodies as a U.S. position. U.S. TAGs also nominate the experts who will represent the United States in technical committee discussions at IEC and ISO meetings around the world. International standards development technical committees are administered by secretariats. Currently, TIA administers four International Secretariats and 16 U.S. TAGs to International Technical Standards Committees. TIA is also an active partner in 3GPP2. TIA shares members, co-develops standards and houses the secretariat of 3GPP2. The following sections highlight some of these activities.

The illustration on page 30 depicts the Worldwide Reach of TIA Standards and our commitment to working with other organizations globally in the development of standards for the entire ICT industry.

# ISO/IEC JTC 1/SC 25: Interconnection of Information Technology Equipment

**TIA SERVES AS THE ADMINISTRATOR OF THE U.S. TECHNICAL ADVISORY GROUP** (US TAG) of Subcommittee 25, which is a subset of the Joint Technical Committee on Information Technology (JTC 1) operating under the auspices of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

SC 25 focuses on the standardization of microprocessor systems and of interfaces, protocols, architectures and associated interconnecting media for information technology equipment and networks for industrial, commercial and residential building environments. These standards are intended to support embedded and distributed computing, storage and information communication systems and their associated input/output components. The subcommittee's scope includes some unique requirements for components but generally references IEC component specifications. SC 25 also includes requirements for interfaces to public networks specified by the International Telecommunication Union.

## 2010 OVERVIEW

As of October 2010, there were 279 active projects assigned to JTC 1/SC 25. Of these, 224 are published as IEC or ISO/IEC Standards, Technical Reports, Amendments and Corrigenda. A total of 17 documents with 2,820 pages were published from October 2009 to September 2010. Of the remaining 55 projects, six are at the Draft International Standard (DIS), Final Draft International Standard (FDIS) or First Draft Amendment (FDAM) stage.

The latest meeting of JTC 1/SC 25, organized by TIA, was held October 22, 2010, in Seattle, WA, and collocated with the IEC 2010 annual meeting hosted by the United States. Twenty-four countries were represented at the meeting. Currently there are 30 participating (P) member countries and 16 observer (O) member countries. The next meeting of SC is expected to be hosted by Australia in October 2011.

ISO/IEC JTC 1/SC 25 is organized into three working groups and one project team, each of which is responsible for specific aspects of information technology infrastructure:

- ISO/IEC JTC 1/SC 25/WG 1, Home Electronic Systems
- ISO/IEC JTC 1/SC 25/WG 3, Customer Premises Cabling
- ISO/IEC JTC 1/SC 25/WG 4, Interconnection of Computer Systems and Attached Equipment
- ISO/IEC JTC 1/SC 25 PTTT, Project Team for Taxonomy and Terminology

Due to the diverse spectrum of activities and the mode of operation, liaisons differ considerably between the three WGs and the PTTT of SC 25.

## 2010 ACTIVITIES

**ISO/IEC JTC 1/SC 25/WG 1, Home Electronic Systems,** produces standards for home and building systems. The scope of WG 1 includes the control of equipment for environmental comfort (heating, ventilation and cooling); energy management (for conservation, utility cost-containment and demand response); lighting and window coverings; audio/video entertainment; telecommunications, life safety and health (including telemedicine); security, home computer networks, and appliances. Home networks can be enabled by structured cabling, wireless technologies, and power line carrier. This Working Group also considers similar network and management functions in commercial buildings.

The scope of WG 1 also encompasses access to external services via residential gateways. A residential gateway links the home network, which is based on local area network

(LAN) technology, with an external network, based on wide area network (WAN) technology such as the Internet. The gateway also provides data security, privacy and safety for devices on the home network.

In addition to the gateway project, WG 1 is writing standards for Home Electronic System architecture, product interoperability, data security, functional safety, device discovery, home network resource management and energy management. The architecture standard accommodates national and regional standards around the world. More than 12 countries send experts to participate at the WG 1 meetings, which are held twice yearly. WG 1 maintains liaisons with the ITU-T and other organizations involved with multimedia systems, cabling systems, applications, safety and energy management (including the GridWise Architecture Council formed by the U.S. Department of Energy).

**ISO/IEC JTC 1/SC 25/WG 3, Customer Premises Cabling,** develops building communications and LAN cabling standards. These standards support a wide variety of applications including Internet, data, voice, video and building automation. Experts from at least 24 countries participate in WG 3.

WG 3 works closely with TIA TR-42, which develops cabling standards for both the United States and international markets, providing the primary technical basis to formulate the U.S. contributions and ballot responses for SC 25 WG 3.

Collaboration with IEC committees, TC 46 – Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories; TC 48 – Electromechanical components and mechanical structures for electronic equipment; and TC 86 – Fibre optics, provides the essential cable and connector components standards referenced by this working group to ensure performance and reliability for systems configured according to its cabling standards. These IEC committees also specify the environmental conditions and test methods supporting the performance and reliability requirements of SC 25 WG 3 cabling systems, (e.g., close co-operation with IEC TC 86, is providing test specifications for installed cabling systems and assemblies).

Bilateral exchange with regional and national standards organizations, such as TIA, CENELEC (European Committee for Electrotechnical Standardization), JIS (Japanese Industrial Standards), AS/NZS (Australian/New Zealand Standards) and others, maintains harmonization between international and regional standards.

**ISO/IEC JTC 1/SC 25/WG 4, Microprocessor Systems and Interconnection of Computer Systems and Attached Equipment,** standardization of microprocessor systems and of interfaces and protocols for the interconnection of computer systems and computer peripheral equipment.

There are about 30 active projects, and the working group published approximately 10 standards in 2010. Most of these projects were initiated by industry, expanded and reviewed in detail in the International Committee for Information Technology Standards (INCITS) SCSI Technical Committee (T10), the INCITS Fibre Channel Technical Committee (T11), the IEEE MSC, and other Standards Developing Organizations, and are used in commonly available computer products. The latest interfaces used in nearly all computing systems are included in WG 4's Program of Work.

**The Project Team for Taxonomy and Terminology (PTTT)** was created during a special meeting in March 2006. The team was formed on a recommendation to develop specifications with common or aligned text under the umbrella of SC 25, in order to take advantage of the established cooperation between ITU-T and the ISO/IEC JTC 1. U.S. experts from WG 1 met jointly with PTTT in Seattle, WA, during the week of October 11, 2010.

**To find out more about participating in ISO/IEC JTC 1/SC 25, please contact Florence Otieno: fotieno@tiaonline.org, +1.703.907.7556**

## ISO/IEC JTC 1/SC 25: INTERCONNECTION OF INFORMATION TECHNOLOGY EQUIPMENT

### U.S. TAG CHAIR: JOHN SIEMON

*The Siemon Company*

### SUBCOMMITTEE

**ISO/IEC JTC1/SC 25 WG 1 — Home Electronic System**
US TAG CHAIR: Dr. Ken Wacks, *MIT*

**WG 3 — Consumer Premises Cabling**
US TAG CHAIR: David Ness, *Nexans*

### ISO/IEC JTC 1/SC 25 COMMITTEE PARTICIPANTS

ADC, Bel Stewart Connectors, Berk-Tek, Broadcom Corporation, Brocade Communications, CommScope Network Solutions, Corning Incorporated, CyberLYNX – Gateway Corporation, Echelon Corporation, EMC Corporation, Erico, Inc. Caddy Fastener Div., Fluke Networks, Home and Building Systems, IBM, Intel Corp., Intertek Testing Services, JP Morgan Chase & Co., Leviton Network Solutions, LONMARK International, Motorola Solutions, OBO Betterman, ODVA Open Devicenet Vendor Association, Panasonic Corp. of North America, Panduit Corporation, PPC, R.L. Pritchard, Sony Electronics, Inc., Surtec America, TE Connectivity, The Siemon Company, US Conec Ltd.

# **IEC TC 46:** Cables, Wires, Waveguides, R.F. Connectors, R.F. and Microwave Passive Components and Accessories

**IEC TC 46 WORKS TO ESTABLISH AND MAINTAIN STANDARDS FOR THE** terminology, design, characteristics, related test methods and requirements for quality assessment of metallic conductors, wires, waveguide, R.F. connectors, R.F. and microwave passive components, accessories for analog and digital transmission systems, and equipment for communication networks and cabling. TC 46 has internal IEC liaisons with SC 48B, SC 65C, SC 86A and TC 100. Working liaisons are also maintained with the International Telecommunication Union's Radiocommunication (ITU-R) and Telecommunication (ITU-T) divisions.

## 2010 OVERVIEW

In TC 46, the U.S. Expert is the International Secretary and the United States holds the Secretariat. The committee is comprised of 23 participant countries (P), which are full-fledged members of the IEC program and 15 countries that participate as observers (O). The committee has three subcommittees: SC 46A, Coaxial Cables, SC 46C, Wires and Symmetric Cables, and SC 46F, RF and Microwave Passive Components. Each of the subcommittees has its own working groups and project teams.

In addition, TC 46 directly oversees three working groups that develop standards in specific areas. The first is WG 5, Screening Effectiveness, which creates and maintains standards relating to electromagnetic compatibility performance (shielding and screening tests) of coaxial and symmetric cables and RF/Microwave passive devices (connectors and waveguides). The second is WG 6, Passive Intermodulation Measurement (PIM), which prepares test methods and investigates relevant limits for Passive Intermodulation in the RF and microwave frequency range for passive components (i.e., connectors, cables, cable assemblies, waveguide assemblies and modules). The last is WG 9, Metallic Cable Assemblies for ICT. The main task of WG 9 is to develop test methods for metallic cable assemblies for ICT (Information and Communications Technology) and multimedia distribution networks and systems. TC 46 also maintains liaisons with TC 102 on matters relevant to antennas, with SC 48B – Connectors for PIM and WG 9.

Thirty-four active publications have been issued by TC 46; 11 of these are due for maintenance over the next three years.

The committee has formal working liaisons with the following IEC committees: IEC/

TC 100, Audio, video and multimedia systems and equipment; IEC/SC 65C/JWG 10, Industrial Networks; IEC/SC 48B, Connectors; IEC/SC 86A, Fibres and Cables; TC 89, Fire Hazard Testing; and ISO/IEC JTC 1/SC 25, Interconnection of Information Technology Equipment.

## 2010 ACTIVITIES

**IEC SC 46A, Coaxial Cables,** is responsible for the preparation and maintenance of standards for coaxial cables and cable assemblies for analog and digital transmission systems. Currently these are for general purpose and RF cables of rigid, semi-rigid and flexible construction used on transmission lines, cabled distribution and similar systems. The committee is comprised of 19 P member countries and 15 O member countries. The subcommittee has one working group, SC 46A/WG 3, Coaxial cables for ICT and multimedia distribution networks and systems. The main task of WG 3 is to complete the work on the revision of the generic specification for coaxial cables, IEC 61196-1-x and its various test procedures. The subcommittee has 49 active publications; seven of which are due for maintenance during the next three years.

The U.S. members of IEC SC 46A voted on seven CDV (Committee Draft for Voting), two NP (New Proposal) and two FDIS (Final Draft International Standard) documents in 2010.

Two documents have been distributed as new work item proposals, NP. The NPs are associated with electrical test methods – Test for stability of mechanical phase and test for phase variation with temperature. The most recent IEC meeting was held in Seattle, WA. The next meeting will be held in Frankfurt, Germany.

**IEC SC 46C, Wires and Symmetric Cables,** establishes and maintains standards for wires and symmetric cable pairs and quads for analog and digital transmission systems and equipment for communication and signaling. These standards may include the following: general cable construction, electrical characteristics, transmission characteristics, mechanical characteristics, environmental characteristics, related test methods and requirements, and

quality assessment procedures. The committee is comprised of 22 P member countries and 13 O member countries. The subcommittee has one working group, SC 46C/WG 7, Premises cables for digital communication. The main task of WG 7 is to revise the IEC 61156 series of specifications for "Multicore and symmetrical pair/quad cables for digital communications" and to coordinate with ISO/IEC JTC 1 SC 25/WG 3 regarding the amendments to IS 11801.

SC 46C has 44 active publications; 23 of these are due for maintenance during the next three years. The last IEC meeting was in Seattle, WA. The next IEC Meeting will be held in Frankfurt, Germany.

**IEC-SC 46F, RF and Microwave Passive Components,** develops standards for R.F. and microwave passive components used in networks and cabling, including test methods for electrical, mechanical and environmental characteristics, as well as product standards. The committee is comprised of 16 P member countries and 15 O member countries. SC 46F also has liaisons with 14 other IEC TC groups, contains 11 project teams, and is supported by three maintenance teams.

Ninety-nine active publications have been issued by SC 46F, and 15 of these are due for maintenance during the next three years. The subcommittee currently has eight documents in circulation. Three documents were voted on and one NP has been issued. IEEE liaison contact needs to be established in order to facilitate the projects of the subcommittee.

The last meeting was in Seattle, WA. The next meeting has not been announced but will most likely be scheduled during the plenary meeting in October 2011.

**To find out more about participating in IEC/TC 46, please contact Florence Otieno: fotieno@tiaonline.org, +1.703.907.7556**

## **IEC/TC 46:** CABLES, WIRES, WAVEGUIDES, R.F. CONNECTORS, R.F. AND MICROWAVE PASSIVE COMPONENTS AND ACCESSORIES

**TECHNICAL ADVISOR, SC 46A & SECRETARY: DAVID WILSON**
*CommScope*

**TECHNICAL ADVISER, SC 46C: WAYNE HOPKINSON**
*Commscope*

**TECHNICAL ADVISOR, SC 46F: JOHN SCHIMELFANICK**
*Applied Engineering Products*

**DEPUTY TECHNICAL ADVISOR: ROGER MATTHEWS**
*PPC*

**DEPUTY TECHNICAL ADVISOR: JOHN MORELLI**

### IEC TAG TC 46 COMMITTEE PARTICIPANTS

ADC, Agilent Technologies, Amphenol R.F., Andrew Corporation, Applied Engineering Products, Inc., Astrolab Inc., Berk-Tek, CommScope Network Solutions, PPC, Commscope, Inc., Copperweld Bimetallic Products Company, Corning Incorporated, Defense Logistics Agency, Defense Supply Center Columbus, Fluke Networks, IW-Microwave, Jesch Consulting Company, Rosenberg of North America, LLC., Summitek Instruments, TE Connectivity, Tensolite Company, TFC/Amphenol, The Siemon Company

# **IEC TC 76:** Optical Radiation Safety and Laser Equipment

**TIA SERVES AS THE ADMINISTRATOR OF THE U.S. TECHNICAL ADVISORY GROUP** (US TAG) of Technical Committee 76, which operates under the auspices of the International Electrotechnical Commission (IEC).

IEC TC 76 develops and maintains safety standards for products that generate laser and other optical radiation. The products covered by this group range from fiber optic and free-space telecommunications systems and other information technology equipment to industrial, medical and entertainment products.

## 2010 OVERVIEW

Standards relating to the safety of products are vital to achieving market acceptance. These standards must ensure safety without imposing an undue burden on the manufacturers and users of the products. Because of the wide diversity of product applications and the overlap of interest, TC 76 is made up of relatively permanent working groups according to application and supporting functions.

IEC TC 76 maintains liaisons with the following IEC committees, for which it monitors documents and provides comments and consultation as needed:

**IEC TC 100,** Audio, video and multimedia systems and equipment, is responsible for audio-visual/optical disc equipment in consumer households.

**IEC TC 108,** Safety of electronic equipment within the field of audio/video, information technology and communication technology, works on computer equipment and accessory products.

**IEC TC 110,** Flat panel display devices, studies equipment that generates optical radiation. (Their work builds upon TC 76 documents for radiation safety issues.)

**ISO TC 172,** ISO/TC 172/SC 9 Liaison, a joint working group with TC 76/WG 10, which is responsible for the development and maintenance of the ISO 11553 series of standards for laser-based machine tools (the CIE - ICNIRP – ICNIRP) to establish safe exposure limits for non-ionizing and optical radiation. The liaison is maintained by joint membership. TC 76 develops hazard classifications based on the ICNIRP exposure limits. International Commission on Illumination (CIE) and IEC TC 34A are responsible for lamps and lamp systems. IEC 62471 is a joint IEC/CIE standard for the photobiological safety of lamps and lamp systems.

## 2010 ACTIVITIES

There were a number of significant accomplishments in 2010, including the unanimous international approval of amendments for a new edition of the IEC 60825-2 standard for fiber optic communications systems, IEC 60825-2, Ed 3.2: 2010-12, and the decision to remove LED transmitters from the scope of IEC 60825-12 for free space optical communications systems. The changes to IEC 60825-2 were developed in response to the 2007 amendments to the horizontal general safety standard for laser equipment (IEC 60825-1). However, the new IEC 60825-2 standard does retain the same hazard classification scheme used for LED fibers, because the radiance of optical fibers is similar to that of lasers. The plan to remove LEDs from IEC 60825-12 was prompted by the issuance of an interpretation notice of policy. However, the IEC Central Office judged this change was substantial and mandated a vote on a new edition of the standard.

Members of TC 76 were also invited by the U.S. National Committee to the 2010 General Meeting in Seattle to meet with other IEC groups such as TC 86, with which TC 76 maintains liaison.

In 2010, there were a total of eight active

working groups in TC 76. These working groups develop and maintain their respective specialty interests in the IEC 60825, IEC 62471, Safety of Laser Products Part 1: Equipment classification and requirements, IEC 60601, Medical Electrical Equipment, and the ISO 11553 series.

**WG 1, Optical Radiation Safety,** reviews biological and physical data and makes recommendations and revisions to the Maximum Permissible Exposure (MPE), Accessible Emission Limits (AEL) and measurement conditions. This WG is now addressing the question of whether the use of magnifying optics would result in an increased hazard for viewing by considering the possible elimination of one of the measurement conditions for classification of laser products. This change could have particular implications for optical fibers in communications equipment.

**WG 3, Laser Radiation Measurement,** develops and maintains, as necessary, technical reports and guides for making radiometric measurements of laser radiation levels, comparing them with the AEL and MPE regulations and performing hazard evaluations pursuant to IEC 60825-1. This WG is developing an amendment to the current technical report (TR), IEC 60825-13, addressing more complex measurement questions in hazard determination. A new committee draft was issued in 2008.

**WG 4, Safety of Medical Laser Equipment,** is developing the second edition of IEC 601-2-22 and a guide for the safe use of medical laser equipment. This WG is developing a standard to be IEC 60601-2-57 and a TR addressing the hazards of intense light equipment in medical and cosmetic applications, which may be causing injuries to individuals throughout the world.

**WG 5, Safety of Fibre Optics Communications Systems,** addresses the safety of fiber optic communications systems. This WG coordinates with other relevant technical committees to develop international standards on the safety of fiber optics consistent with IEC 60825. This includes enclosed transmission systems and semiconductor lasers. An interpretation sheet (ISH) was issued stating that Edition 1.2 of IEC 60825-1 should be used with fiber optic communication systems pending the revision of IEC 60825-2.

**WG 7, High Power Lasers,** develops requirements for the radiation safety of high power lasers. This WG has amended IEC 60825-4 with a new annex addressing laser guards.

**WG 8, Development and Maintenance of Basic Standards,** develops and maintains basic standards and annexes for the safe use of lasers (except those with specific application tasks), including editing IEC 60825-1, development of a laser light show document, a labels and symbols document, and a manufacturer's checklist standard. This WG is responsible for the new edition of IEC 60825-3, a TR addressing the safety of laser light shows and displays. WG 8 is also working on simplified labeling and the withdrawal of the TR 60825-10.

**WG 9, Non-Coherent Sources,** develops MPEs and their respective measurement conditions for broadband sources. This WG is currently preparing a new IEC TR 62471-2 to provide guidance on the use of IEC 60825-1 or 62471-1 to determine the hazard classification of non laser equipment.

**WG 10, Laser Machine Tools,** (jointly with ISO TC 172/SC9), develops and maintains the ISO 11553 series of standards. Recent work has been the development of new standards to address hand-held delivery systems and the noise directive in the European Union.

U.S. Votes and Comments were submitted to TC 76 on the following standards: 76/417/ CD Annex for 60825-4 Proprietary laser guard testing; 76/422/ DC Interpretation Sheet for 60825-12 to remove LEDs from the free space optical communications standard; 76/424/ DTR Amendment to 60825-13 Technical Report on Measurements; 76/425/ DTR Technical Report on passive components in high power optical fiber communications systems; 76/426/ DC Interpretation Sheet 2 for 60825-1 regarding the Time Of Total Pulse; and 76/428 DTR Technical Report on passive components in high power Optical Fiber Communications Systems.

TC 76 also published the following documents in 2010: IEC 60825-2, Ed 3.2: *2010-12 Safety of Optical Fibre Communications Systems;* IEC 60825-1, Ed 3.0: *2010-09 Amendment 2 Safety of Optical Fibre Communications Systems;* and IEC/TR 60825-14 Ed 2.1: *2010-11 Safety of Laser Products – Part 17: Safety Aspects for Use of Passive Optical Components and Optical Cables in High Power Optical Fibre Communication Systems.*

**To find out more about participating in IEC TC 76, please contact Florence Otieno: fotieno@tiaonline.org, +1.703.907.7556**

## IEC TC 76: OPTICAL RADIATION SAFETY AND LASER EQUIPMENT

**CHAIRMAN AND TECHNICAL ADVISOR: JEROME E. (JERRY) DENNIS**
*Independent Consultant*

**SECRETARY: WILLIAM ERTLE**
*Rockwell Laser Industries*

**DEPUTY TECHNICAL ADVISOR: ROBERT WEINER**
*Weiner Associates*

### IEC TAG TC 76 COMMITTEE PARTICIPANTS

Advanced Display Technologies, Air Force Research Laboratory, Alcatel-Lucent, AT&T Labs, B.E. Meyers., Bushnell Performance Optics, CDRH/OSEL/DP, Communication, Education, and Radiation, Corning Incorporated, David Sliney Consulting,FDA/CDRH/ ODE HFZ-410, Handren Associates, Inc., Honeywell, Intertek Testing Services, L.A.I. International, Laser Compliance, Laser Products Safety LLC., Microvision, Inc., Naval Surface Warfare Center, NIST-OLES, Palomar Medical Technologies, PSC Scanning, Inc., Rockwell Laser Industries, U.S. Army Center for Health Promotion, UL Underwriters Laboratories Inc., Walt Disney World, Weiner Associates

# IEC TC 86: Fibre Optics

**TIA SERVES AS THE ADMINISTRATOR OF THE U.S. TECHNICAL ADVISORY GROUP** (US TAG) of Technical Committee 86, operating under the auspices of the International Electrotechnical Commission (IEC).

The goal of the committee is to prepare standards for fiber optic systems, modules, devices and components intended primarily for use with communications equipment. This activity covers terminology, characteristics, related tests, calibration and measurement methods, functional interfaces, and optical, environmental and mechanical requirements to ensure reliable system performance.

## 2010 OVERVIEW

The United States holds the secretariat for TC 86.

IEC TC 86 has liaisons with several other IEC Technical Committees, including Laser Safety, Multimedia, Flat Panel Displays, as well as ISO/IEC SC 25 Interconnection of IT Equipment and ITU-T SG 15 on Optical Transport. There are three subcommittees: Fibre and Cable; Interconnecting Devices; and Systems. There are also several working groups that provide additional resources. The United States National Committee (USNC) TAGs typically co-locate with the TIA TR-42 committee meetings. The purpose of the US TAG is to initiate and approve U.S. Proposals for New Work and to establish U.S. consensus positions on IEC documents.

## 2010 ACTIVITIES

**IEC – SC 86A, Fibres and Cables,** focuses on international standards for optical fibres and optical cables embracing all types of communications applications. This activity covers terminology, generic characteristics, test and measurement methods, and specifications for all types of single-mode and multimode optical fibres and all types of optical fibre indoor and outdoor cables to ensure reliable system performance and operation.

The subcommittee has formal liaisons with the following committees: IEC/TC 7, Overhead Electrical Conductors; IEC/TC 11, Overhead Lines; IEC/TC 20, Electric Cables; IEC/TC 46, Cables, Wires, Waveguides, R.F. Connectors, R.F. and Microwave Passive Components and Accessories; IEC/TC 48, Electromechanical Components and Mechanical Structures for Electronic Equipment; IEC/TC 76, Optical Radiation Safety and Laser Equipment; IEC/TC 78, Live Working; IEC/TC 81, Lightning Protection; IEC/TC 89, Fire Hazard Testing; IEC/TC 100, Audio, Video and Multimedia Systems and Equipment; and ISO/IEC JTC 1/SC 25, Interconnection of Information Technology Equipment.

SC 86A has two working groups: WG 1, Fibres and Associated Measuring Methods and WG 3, Cables.

TC 86 met in February 2010 in Palm Springs, FL. IEC TC 86 meetings co-locate with TIA TR-42 committee meetings. The next IEC TC 86 meeting is yet to be determined. The 74th IEC General Meeting was held in Seattle, WA, in October 2010.

**IEC – SC 86B, Fibre Optic Interconnecting Devices and Passive Components,** focuses on international standards for fibre optic interconnecting devices and passive components, embracing all types of communications applications. This activity covers terminology, characteristics, related test and measurement methods, and functional interfaces, including all mechanical, environmental and optical requirements, to ensure interoperability and reliable performance of fibre optic interconnecting devices and passive components.

SC 86B has three Working Groups: WG 4, Standard Tests and Measurement Methods for Fibre Optic Interconnecting Devices and Passive Components; WG 6, Standards and Specifications for Fibre Optic Interconnecting Devices and Related Components; and WG 7, Standards

and Specifications for Fibre Optic Passive Components. The Working Groups met in April 2010 in Belgium and in October 2010 in Seattle.

There were a number of key developments for IEC SC 86 in 2010. Throughout the year, the subcommittee processed a total of 77 documents and published 18 standards. A technical report covering the background on the inspection requirements of 61300-3-35 was started that will include the technical presentation and contributions from Ciena and iNEMI. Secondly, work on a technical report on the calculation of measurement uncertainty was started. In terms of structural changes, the IEC 61754-7 was split into IEC 61754-7-1 for the single-row MPO and IEC 61754-7-2 for the two-row MPO (which will be launched as an NP). SC 86B has also established liaisons with ISO/IEC JTC 1 SC 25 WG 3, CENELEC TC 86BXA SC 65C/JWG 10 TC 76/WG 5 TC 113 and other IEC Subcommittees and has formed a new liaison with the 1394 Trade Association. A number of new work items were initiated, including several measurement methods for connectors with rectangular ferrules — regarding the guide pin withdrawal force of connectors, the guide pin retention force of connectors and the coupling sleeve spring force of connectors. New work on passive optical components was also started, including 1xN/2xN passive optical power splitters, pigtail-style fixed attenuators, pigtail isolators and pigtail circulators, and a new reliability document on the high power qualification of passive optical components. Lastly, the development of performance standards for reference connectors was launched.

The 74th IEC General Meeting was hosted by the United States in Seattle in October 2010. The 75th IEC General Meeting will be hosted by Australia in Melbourne in October 2011.

**IEC – SC 86C, Fibre Optic Systems and Active Devices,** focuses on international standards for fiber optic systems and active devices embracing all types of communications applications. This activity covers terminology, characteristics, test and measurement methods, and functional interfaces, including all mechanical, environmental, optical and electrical requirements to ensure interoperability and reliable system performance. The United States holds the secretariat for SC 86C.

SC 86C has liaisons with IEC TC 76, Optical Radiation Safety and Laser Equipment; IEC TC 100, Audio, Video and Multimedia Systems and Equipment; IEC TC 110, Flat Panel Display Devices; ISO/IEC JTC 1/SC 25, Interconnection of Information Technology Equipment; and the ITU-T.

There are four working groups: WG 1, Fibre Optic Communications Systems and Sub-

**To find out more about participating in IEC TC 86, please contact Florence Otieno: fotieno@tiaonline.org, +1.703.907.7556**

## IEC TC 86: FIBRE OPTICS

**SECRETARY, TC 86: STEVEN E. SWANSON (U.S.)**
*Corning, Incorporated*

**ASSISTANT SECRETARY, TC 86: ELAINA FINGER (U.S.)**
*Corning, Incorporated*

**TECHNICAL ADVISOR, IEC – SC 86A: MIKE KINARD**
*OFS*

**TECHNICAL ADVISOR, IEC – SC 86B: STEVE SWANSON**
*Corning Incorporated*

**TECHNICAL ADVISOR, IEC – SC 86C: ATUL SRIVASTAVA**
*One Terabit*

### IEC TAG TC 86 COMMITTEE PARTICIPANTS

ADC, Aegis Lightwave, Amphenol Fiber Optic Products, Bell Labs, Berk-Tek, Chromis Fibreoptics, Ciena Corporation, Cisco Systems, Inc., Columbus, CommScope Network Solutions, Condumex, Inc., Corning Incorporated, Defense Supply Center, Diamond USA Inc., Direct Optical Research DOR, Draka Comteq Optical Fibre, DSM Desotech Inc., EXFO E.O. Engineering, Inc., Fluke Networks, GreenleeJDSU, Judy Anderson, Leviton Network Solutions, Lucent Technologies, Norland Products, Inc., Noyes Fiber Systems, OFS, One Terabit, Optical Test & Standards Consulting, Ortronics, Inc., Panduit Corporation, Photo Kinetics, Inc., R.M. MANNING Consulting, Sumitomo Electric Lightwave Corp., TE Connectivity, Telcordia Technologies, Textron Inc., The Siemon Company, U.S. Navy, US Conec, LTD., Westover Scientific, Xtellus Dynamic Optics, Yazaki NA Inc., Y-Connect Operations

systems; WG 3, Optical Amplifiers; WG 4, Fibre Optic Active Components and Devices; and WG 5, Dynamic Modules and Devices. The Working Groups met in March 2010 in San Diego and in October 2010 in Seattle during the 74th IEC General Meeting.

The next IEC SC 86C TAG Meeting is yet to be determined. The 75th IEC General Meeting will be held in Melbourne, Australia, in October 2011.

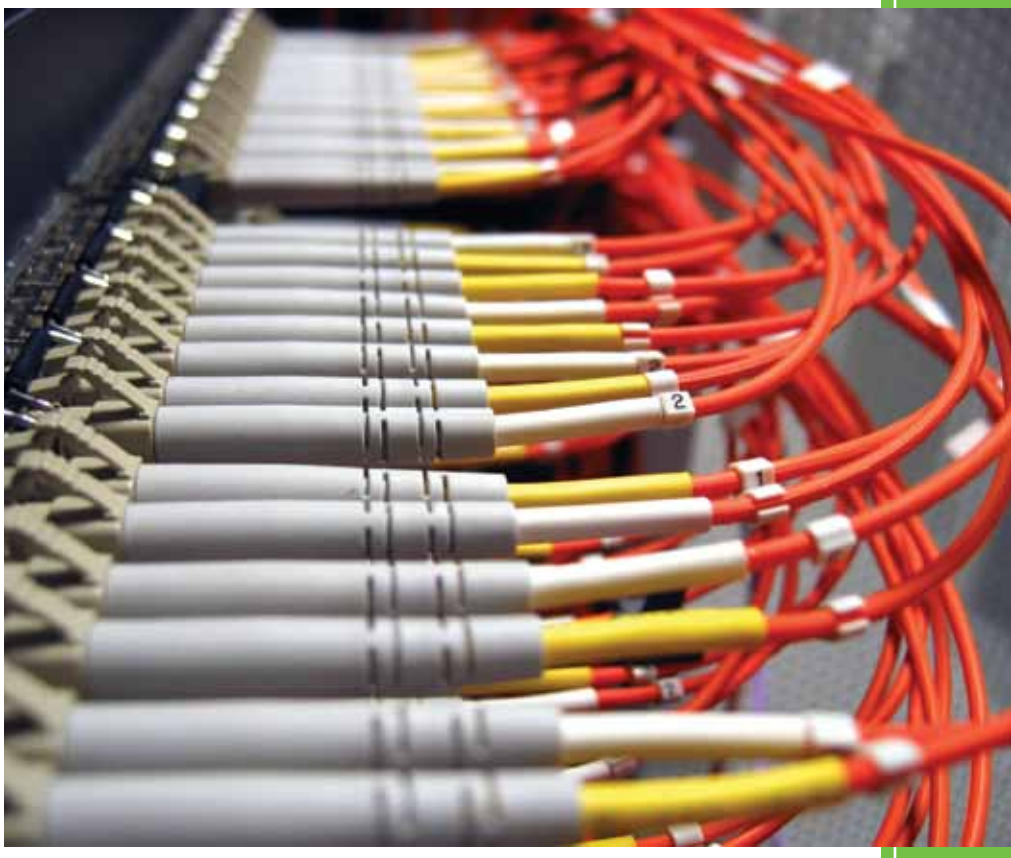
The standardization activities of SC 86C are focused on optical communications at very high bit-rate and on new access and distribution optical systems. A considerable number of experts attended the spring 2010 WG meetings at San Diego in conjunction with the Optical Fiber Communication Conference and Exposition (OFC) and the National Fiber Optic Engineers Conference (NFOEC), which were hosted by University of California, San Diego. During 2010, new activity was started on topics of increasing current interest, including error vector magnitude characterization, high power amplifiers, and 40G transceivers; at the 74th IEC GM Poster Session a poster on SC 86C activities and achievements was presented. SC 86C processed a total of 30 documents and published eight standards during the year.

The WGs of SC 86C had many accomplishments in 2010. WG 1 started a new activity on the topical subject of error vector magnitude characterization, with the objective of publishing a Technical Report. Regarding the re-launched activity on fibre-optic sensors, a Maintenance Team (MT) of nine experts was set up with the task of revising the generic specification 61757-1. However, in consideration of the present market need in this sector, the MT is considering starting the preparation of five NPs. If this is confirmed and a stable activity on this field can be ensured, the re-activation of WG 2, Fibre-Optic Sensors could be considered. A TR on guidance of multimode launching conditions is under preparation as a follow-up to the former TC 86/CG-MMLC.

WG 3 published a sound TR on maximum permissible optical power for the safe and damage-free use of optical amplifiers, including Raman amplifiers. Activity on semiconductor optical amplifiers (SOAs), made in conjunction with WG 4, is leading to the preparation of a first TR report illustrating the characteristics of SOAs with respect to optically pumped fibers (OFAs), highlighting their applications and peculiar properties (gain ripple, polarization dependence, high non-linearity, etc.).

WG 4 will eventually stabilize the text of the test methods for wiggle effects. The working group decided to clarify the field of applicability of two different methods for the benefit of the standard user. A committee draft for vote (CDV) including these last agreements will be circulated shortly. An NP to be launched soon about the package and interface of 40G transceivers was successfully discussed.

The field of dynamic modules, particularly reconfigurable add/drop multiplexers (ROADM), is rapidly evolving, as witnessed at the 2010 European Conference and Exhibition on Optical Communication (Turin, Italy, September 2010). This makes the development of standards difficult, but WG 5 has identified some "lower level" dynamic modules, such as optical channel monitor (OCM) and wavelength selective switch (WSS), sufficiently stable to be standardized. To this purpose, the development of TRs and Performance Specification Templates has been started on these modules.



# ISO TC 204: Intelligent Transport Systems


**THE U.S. TECHNICAL ADVISORY GROUP (US TAG) TO ISO/TC 204 APPOINTS THE** U.S. delegation to ISO/TC 204. Both the structure and scope of the U.S. TAG shadow those of ISO/TC 204. The domestic shadow group for each ISO/TC 204 Working Group is called a Working Advisory Group (WAG) in the US TAG.

The work program of the US TAG tracks that of ISO/TC 204. All work items in ISO/TC 204 are circulated to, and in some cases originated by, the US TAG prior to their approval at the international level.

## 2010 OVERVIEW

ISO/TC 204 encompasses standardization of information, communications and control systems in the field of urban and rural surface transportation, including intermodal and multimodal aspects, traveler information, traffic management, public transport, commercial transport, emergency services and commercial services, generally referred to as Intelligent Transport Systems (ITS).

The following aspects of intercity rail are included in the work of ISO/TC 204: intermodal movement of passengers and freight, information systems relating to passenger and freight rail transport, and the use of ITS technology at the intersection of roads and rails (grade crossings or level crossings). Other aspects of intercity rail are not included in the work of ISO/TC 204.

ISO/TC 204's work does not include ITS systems that are completely self-contained in the vehicle and that do not interact with other vehicles or the infrastructure. This is the responsibility of ISO/TC 22.

ISO/TC 204 is responsible for the overall system and infrastructure aspects of ITS, as well as the coordination of the overall ISO work program in this field, including the schedule for standards development, taking into account the work of existing international standardization bodies.

## 2010 ACTIVITIES

ISO/TC 204 meets twice a year. The first meeting of 2010 took place April 18–23, 2010, in New Orleans, LA.

New work items approved for adoption in New Orleans included Communications Access for Land Mobiles (CALM) Geo-routing, Intelligent Transport Systems (ITS) – CALM Handover mechanisms, ITS – CALM WAVE, Criteria for Privacy and Integrity Protection in Probe Vehicle Information Systems, and Vehicle Interface for Provisioning and Support of ITS Services – Part 2: Vehicle Mobile Gateway (VMG) Protocol Requirements and Specification

Work items approved for publication in New Orleans included CALM IPv6 Networking, CALM Non-IP Networking, and CALM Applications using 802.20.

The second meeting of ISO/TC 204 took place Oct. 31–Nov. 4, 2010, in Jeju Island, Korea. New work items adopted at this meeting include Electronic Fee Collection (EFC) – Interface definition between DSRC-OBE and external in-vehicle devices, intelligent transport systems (ITS) – Electronic information exchange to facilitate the movement of freight and its intermodal transfer – governance rules to sustain electronic information exchange methods, ITS – Public transport – public transport user information – Part 1 – Framework, ITS – The use of simulation models for evaluation of traffic management systems: input parameters and reporting template for simulation of traffic signal control systems, ITS – Assisted parking system (APS) – Performance requirements and test procedures,

ITS – CALM – IPv6 optimization, and ITS – CALM – IPv6 Networking Security.

In 2011, ISO/TC 204 will meet in April in Prague, Czech Republic, and in October in Tampa, FL.

The US TAG to ISO/TC 204 typically meets three or four times a year and maintains extensive email correspondence for the purpose of formulating U.S. positions on the technical issues of the TC. In 2011, the US TAG will meet in January, March, June and September.

**To find out more about participating in ISO/TC 204, please contact TIA standards at standards@tiaonline.org**

# ISO TECHNICAL COMMITTEE 204 (ISO TC 204), INTELLIGENT TRANSPORT SYSTEMS

## ISO TC 204 LEADERSHIP

**Committee Chair (U.S.):** Michael Noblett, *IBM Global Services*
**Secretary (U.S.):** Tyler Messa, *Telecommunications Industry Association (TIA)*

## WORKING GROUPS

**WG1: Architecture**
CONVENER: Vacant, *United Kingdom*

**WG 3: ITS Database Technology**
CONVENER: Jun Shibata, *Japan*

**WG 4: AEI/AVI (Automatic Equipment Identification/Automatic Vehicle Identification)**
CONVENER: Knut Evensen, *Norway*

**WG 5: Electronic Fee and Toll Collection**
CONVENER: Jesper Engdahl, *Sweden*

**WG 7: General Fleet, Commercial & Freight Management**
CONVENER: Dr. Lewis Sabounghi, *Canada*

**WG 8: Public Transport/Emergency**
CONVENER: Koorosh Olyai, *USA*

**WG 9: Integrated Transport Information, Management & Control**
CONVENER: Dean Zabrieszach, *Australia*

**WG 10: Traveler Information Systems**
CONVENER: Paul Burton, *United Kingdom*

**WG 14: Vehicle/Roadway Warning and Control Systems**
CONVENER: Yoshimi Furukawa, *Japan*

**WG 15: Dedicated Short Range Communications for ITS Applications**
CONVENER: Dr. Carl Rokitansky, *Germany*

**WG 16: Wide Area Communications/ Protocol and Interfaces**
CONVENER: T. Russell Shields, *USA*

**WG 17: Nomadic Devices**
CONVENER: Dr. Young-Jun Moon, *Korea*

**WG18: Cooperative Systems**
CONVENER: Dr. Hans-Joachim Schade, *Germany*

## US TAG ISO TC 204 LEADERSHIP

**US TAG Chair:** Richard Schnacke, *Transcore.*

## WORKING ADVISORY GROUPS

**WAG 1: Architecture**
CHAIR: Thomas Kurihara, *TKstds Management*

**WAG 3: ITS Database Technology**
CHAIR: Thomas Lydon, *NAVTEQ*

**WAG 4: AEI/AVI (Automatic Equipment Identification/Automatic Vehicle Identification)**
CHAIR: Richard Schnacke, *Transcore*

**WAG 5: Electronic Fee and Toll Collection**
CHAIR: Vacant

**WAG 7: General Fleet, Commercial & Freight Management**
CHAIR: Michael Onder, *U.S. DOT, Federal Highway Administration*

**WAG 8: Public Transport/Emergency**
CHAIR: Martin Schroeder, *APTA*

**WAG 9: Integrated Transport Information, Management & Control**
CHAIR: Robert Rausch, *Transcore*

**WAG 10: Traveler Information Systems**
CHAIR: Joel Markowitz, *Metropolitan Transportation Commission (San Francisco Bay Area)*

**WAG 14: Vehicle/Roadway Warning and Control Systems**
CHAIR: Dr. Steven Shladover, *California PATH Program (U.C. Berkeley)*

**WAG 15: Dedicated Short Range Communications for ITS Applications**
CHAIR: Richard Schnacke, *Transcore*

**WAG 16: Wide Area Communications/ Protocol and Interfaces**
CHAIR: Steve Sprouffske, *Kapsch TrafficCom Inc.*

**WAG 17: Nomadic Devices**
CHAIR: Chung-Min Chen, *Telcordia*

**WAG 18: Cooperative Systems**
CHAIR: Michael Howarth, *Intelligent Devices Inc.*

# Third Generation Partnership Project 2 (3GPP2)

**TIA IS A FOUNDING PARTNER OF 3GPP2 AND HAS SERVED AS THE PROJECT'S** Secretariat since its inception in 1999. 3GPP2 brings together more than 50 companies from five standards development organizations to create globally applicable third-generation wireless communications specifications based on the cdma2000® technology. These specifications are then submitted to the project's organizational partners for conversion into standards.

## 2010 OVERVIEW

3GPP2 is a collaborative 3G telecommunications specification-setting project, comprised of participants from the Americas and Asia, focusing on global specifications for the cdma2000® air interface, core network (Mobile Application Part), all IP core network, Radio Access Network, and other ancillary specifications. In addition, several organizations such as the CDMA Development Group (CDG), IPv6 Forum



# THIRD GENERATION PARTNERSHIP PROJECT 2 (3GPP2)

## 3GPP2 COMMITTEE PARTICIPANTS

Aeroflex, Agilent Technologies, AirCell, LLC, Airvana, AirWalk Communications, Inc., Alcatel-Lucent Shanghai Bell, Alcatel-Lucent, Bridgewater Systems, China Telecom, Cisco Systems, Inc., COMPRION GmbH, CONVERLOGIC, DBSD North America, Ericsson, Inc., ETRI, Gemalto, Inc., Hitachi, Ltd., Huawei Technologies Co., Ltd., KDDI Corporation, KT Corporation, Kyocera Corporation, LG Electronics, Inc., LG Uplus, LightSquared, Motorola Mobility, Inc., Motorola Solutions, Inc., National Communications System, NEC Corporation, Nokia Siemens Networks, Qualcomm, Reliance-IITM Telecom Centre for Excellence, Research In Motion, Research Institute of Telecommunication Transmission, MII, Rohde & Schwarz, America, Samsung Electronics Co. Ltd., SGS Wireless US, Inc., Sierra Wireless, SK Telecom, Sony Ericsson Mobile Communications Japan, Inc., Spirent Communications, Sprint Nextel, Tatara Systems, Telcordia Technologies, Inc., TeleCommunication Systems, Inc., US Cellular, Verizon Wireless, VIA Telecom, and ZTE Corporation.

and the Femto Forum are members of 3GPP2. Collectively, these groups represent the market interests and promoters of 3GPP2 technologies.

2010 was another year of outstanding accomplishments, with activities focused on the development of specifications for the advancement of cdma2000® 1x and High Rate Packet Data (HRPD), the advanced security framework for HRPD and eHPRD, radio access network and core network support for femtocells (Phase 2) and interworking of technologies. A focus on emerging technologies was also another cornerstone of development for 3GPP2 in 2010, with particular attention to M2M communications for cdma2000® networks, sustainability (green energy efficient environment) and the smart grid.

## 2010 ACTIVITIES

The air interface technical specification group continues to work closely with ITU-R WP5D for updates for M.1457 for IMT-2000 and submitted the final update package for CDMA MC (cdma2000® and HPRD) for M.1457 Revision 10.

This group has also worked very closely to support the work for the U.S. NIST (National Institute of Standards and Technology) Smart Grid Interoperability Panel, completing an evaluation of the characteristics of its wireless access technologies and showing that cdma2000® 1x and HRPD systems can easily handle the Wireless Wide Area Network (WAN) traffic created by the use of cases under the heaviest load.

Two important studies were published by 3GPP2, one describing M2M (machine to machine) communications for cdma2000® Networks and the second describing Energy Efficiencies for a Greener Environment.

Another achievement includes the publication of specifications for Revision E of cdma2000® 1x Advanced, which provides a significant increase in voice capacity — the HRPD Advanced specifications — which assist in handling the ever-increasing demand for data, and femtocells — for relieving the traffic load of macro networks that have been stressed by the growth of mobile data applications and cloud computing services. 3GPP2 will continue its ongoing work to address the interoperability of HRPD, 1x and LTE as enhancements are added to these technologies.

2011 began with several new projects, including the development of a Systems Requirement Document for M2M and a work item to address Dynamic RAN Power Management, which will allow for a reduction in power and energy at cellular sites during low-usage intervals.

As of December 2010, the cdma2000® and HRPD subscriber base has reached more than half a billion subscribers, is supported by over 500 networks in over 120 countries, and is compatible with more than 2,600 devices in the market, according to CDMA Development Group statistics.

# TIA Standards Development Program Participants

TIA standards activities and programs are open to TIA members and non-members. TIA thanks the following companies and organizations for their 2010/2011 participation in formulating positions and preparing international standards and reports for use by industry and government.

- 2M Companies, Inc.
- 4SE, Inc.
- AASKI Technology, Inc.
- ADC Telecommunications, Inc.
- ADTRAN
- Advance Display Technologies
- Aegis Lightwave
- Aero Solutions, LLC
- Aeroflex
- Agilent Technologies, Inc.
- Air Force Research Laboratory
- AirCell, LLC
- Airvana, Inc.
- Alcatel-Lucent
- Allied Telephone and Data Corp.
- American Tower Corporation
- Amphenol Fiber Optic Products
- Amphenol R.F.
- Anagran, Inc.
- Andrew Corporation
- Anixter Inc.
- Anue Systems
- APCO Project 25
- Apple
- Applied Engineering Products, Inc.
- Aselsan Inc.
- AST Technology Labs, Inc.
- Astrolab Inc.
- AT&T Labs
- AT&T Mobility
- B&C Contracting Company
- B&T Engineering, Inc.
- B.E. MEYERS
- Baxter Enterprises
- Bechtel Telecom
- Bel Stewart Connectors
- Belden Networks Division
- Bell Mobility
- Bentley Systems, Inc.
- Berk-Tek
- Black & Veatch Telecommunication
- Bridgewater Systems Inc.
- Broadcast Tower Technologies, Inc.
- Broadcom Corporation
- Brocade Communications
- BTR Netcom Inc.
- Bushnell Performance Optics
- C Faulkner Engineering
- C2 Consulting
- Capitol Technology Affairs, LLC
- Cassidian Communications
- CDMA Development Group
- CDRH/OSEL/DP
- Cell Trees Inc.
- Chromis Fibreoptics
- Ciena Corporation
- Cisco Systems, Inc.
- CML Microcircuits (USA) Inc.
- CMX
- CommFlow Resources Inc.
- CommScope Inc.
- CommScope Network Solutions
- CommScope, Inc. of N. Carolina
- Comprion GmbH
- Condumex, Inc.
- Connectivity Technologies, Inc.
- Continental Automated Buildings Association
- Converlogic
- Copperweld Bimetallic Products
- Corning Cable Systems
- Corning Incorporated
- Crown Castle International Corp.
- CSI Telecommunications, Inc.
- CyberLYNX - Gateway Corporation
- Daniels Electronics Ltd.
- Datron World Communications
- David Sliney Consulting
- Davidson Engineering, LLC
- DaVinci Engineering Inc.
- Defense Information Systems Agency
- Defense Logistics Agency
- Defense Supply Center, Columbus
- Diamond USA, Inc.
- Digital Voice Systems, Inc.
- Direct Optical Research Co.
- Dolby Laboratories Inc.
- Draka Comteq Optical Fibre
- DSM Desotech Inc.
- DYMO (RHINO)
- EF Johnson
- Echelon Corporation
- EET, L.L.C
- Ehresmann Engineering, Inc.
- Electronics Research Inc.
- EMC Corporation
- ERICO Inc.
- Erico, Inc. Caddy Fastener Div.
- Ericsson, Inc.
- ESRI, Inc.
- Etherstack
- EXFO E.O. Engineering, Inc.
- Experior Laboratories, Inc.
- FAL Associates
- FDA/CDRH
- FDH Engineering
- FiberSource Inc.
- FLO Forum
- Fluke Networks
- Frye-Comm Consulting LLC
- FTR&D LLC
- Fujitsu Network Communications, Inc.
- Furukawa Industrial S.A.
- FWT, Inc.
- Gemalto Inc.
- General Cable
- General Dynamics C4 Systems
- Glen Martin Engineering
- Global Tower Partners
- Globalstar
- GPD Associates
- Greenlee Textron Inc.
- Handren Associates, Inc.
- Harger, Inc.
- Harris Corporation
- HellermannTyton
- Henkels & McCoy Inc.
- Hewlett-Packard
- Hitachi Cable Manchester
- Hitachi Telecom (USA) Inc.
- Homaco
- Home & Building Systems
- Honeywell
- Huawei Technologies USA
- Hubbell Premise Wiring
- Hughes Network Systems, LLC
- IBM
- ICC
- Icom America Inc.
- Ideal Industries, Inc.
- IHS
- ILS Technology

- Industrial Engineering & Testing
- Industry Canada
- Intel Corp.
- Intellon
- Intertek Testing Services
- Intrado
- IP Fabrics
- ISE Incorporated
- IW-Microwave
- J&M Consultants, Inc.
- J. Upton Consulting
- JDS Uniphase Inc.
- JDSU
- Jesch Consulting Company
- JP Morgan Chase & Co.
- KCI Technologies, Inc.
- Kenwood USA Corp.
- Kish, Paul
- KITCO Fiber Optics
- LAI International
- Laser Compliance
- Laser Product Safety LLC
- Leviton Network Solutions
- LG InfoComm U.S.A., Inc.
- LightSquared
- Littelfuse Inc.
- Lockheed Martin Corporation
- LONMARK International
- LSI Corporation
- Lucent Technologies, Bell Labs
- M/A-Com, Inc.
- Malouf Engineering International
- MC Communications
- Megger
- Microsoft Corporation
- Microvision Inc.
- Midland Radio Corp.
- MITRE Corp.
- Mitsubishi Electric Automation, Inc.
- MLD Engineering Solutions, Inc.
- Molex Inc.
- Motorola Mobility Inc.
- Motorola Solutions
- Movius Interactive Corporation
- MUTI
- National Technical Systems (NTS)
- Naval Surface Warfare Center
- NetGemini, Inc.
- NeuStar Inc.
- New Mexico State Police
- Nexans/Berk-Tek
- NIST-OLES
- Nokia Inc.
- Nokia Siemens Networks
- Norland Products Inc.
- Northwest Information Services
- Novatel Wireless Inc.
- Noyes Fiber Systems
- NTIA
- Numerex Corp.
- OBO Bettermann
- OCLARO
- ODVA Open Devicenet Vendor Association, Inc.
- OFS
- One Terabit
- OneChip Photonics
- Optical Cable Corporation
- Optical Communications, JDSU
- Optical Test & Standards Consult
- OptoTest Corp.
- Oregon State Police
- Ortronics, Inc.
- PacketStorm Communications, Inc.
- Palomar Medical Technologies
- Panasonic Corp. of North America
- Panasonic Electric Works Laboratory of America
- Panduit Corporation
- Paul J. Ford and Company
- Phoenix Contact
- Photon Kinetics, Inc.
- Plantronics
- PowerTrunk
- PPC
- PSC Scanning, Inc.
- Quabbin Wire & Cable Co., Inc.
- Qualcomm
- R.L. Pritchard
- R.M. MANNING Consulting
- Raytheon
- ReliaPOLE Inspection Services Co.
- RELM Wireless Corp.
- Research In Motion
- RIT Technologies Inc.
- Rockwell Laser Industries
- Rogers Communications
- Rohde & Schwarz, Inc.
- Rohn Products LLC
- Rosenberger of North America, LLC
- RTKL Associates Inc.
- Sabre Towers & Poles
- SAIC
- Samsung Electronics
- Samsung Telecom. America
- Sandvine Incorporated
- Shively Labs
- Sierra Wireless America, Inc.
- Sigma Delta Communications, Inc.
- Signamax Connectivity Systems, Inc.
- Sioux Falls Tower Specialists
- Sony Electronics, Inc.
- Sony Wireless Tech Division
- Spectrum Watch
- Spirent Communications
- Sprint Nextel
- SS8 Networks, Inc.
- Stainless LLC
- State of South Carolina
- Stealth Concealment Solutions, Inc.
- Sumitomo Electric Lightwave Corp.
- Summitek Instruments
- Superior Essex
- Surtec America
- Tait Radio Communications
- Tatara Systems
- TE Connectivity
- Technisonic Industries Ltd.
- Telchemy, Incorporated
- Telcordia Technologies
- TeleCommunication Systems, Inc.
- Tellabs, Inc.
- Tensolite Company
- Texas Instruments, Inc.
- TFC/Amphenol
- Thales Communications, Inc.
- The Fiber Optic Association
- The Siemon Company
- The Wiremold Company
- Timbercon, Inc.
- Tower Consultants, Inc.
- Tower Engineering Professionals, Inc.
- Tower Technology
- Towerkraft Engineering, P.C.
- TranSwitch Corporation
- Turris Corporation
- TX RX Systems, Inc.
- Tyco Electronics
- U.S. Department of Commerce
- U.S. Department of Homeland Security
- U.S. Department of Justice
- U.S. Navy
- Underwriters Laboratories Inc.
- Uniden America Corporation
- Uniden Engineering Services
- U.S. Army Center for Health Promotion and Preventive Medicine
- US Cellular
- US Conec LTD
- U.S. Fish & Wildlife/DOI
- Valmont Communications
- Vanco International
- Verizon Communications
- VIA Telecom
- ViaSat, Inc.
- VTech Communications
- Walker Engineering Inc.
- Walt Disney World
- Weiner Associates
- Weisman Consultants
- Westover Scientific
- WesTower Communications Inc.
- Wiltec Technologies
- WireFreeComm Inc.
- WK3C Wireless LLC
- Xtellus Dynamic Optics
- Yazaki N.A.
- Y-Connect
- Zetron, Inc.
- ZTE San Diego

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