2008-2009

STANDARDS & TECHNOLOGY ANNUAL REPORT

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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TIA STAFF

EXECUTIVE

Grant E. Seiffert
President
+1.703.907.7701
gseiffert@tiaonline.org

Andrew Kurtzman
Vice President &
Corporate Counsel
+1.703.907.7413
akurtzman@tiaonline.org

Mary Piper Waters
Director of Operations & Executive Assistant to the President
+1.703.907.7701
mwaters@tiaonline.org

STANDARDS AND TECHNOLOGY

VACANT
Vice President, Standards & Business Development

Henry Cuschieri
Associate Vice President,
New Initiatives
+1.703.907-7497
hcushieri@tiaonline.org

Stephanie Montgomery
Director, Standards & Technology
+1.703.907.7735
smontgomery@tiaonline.org

John Derr
Director, Technical &
Regulatory Affairs
+1.703.907.7791
jderr@tiaonline.org

Victoria Mitchell
Sr. Manager, 3GPP2
+1.703.907-7779
vmitchell@tiaonline.org

Matthew Langhan
Manager, Standards Internet Development
+1.703.907.7482
mlanghan@tiaonline.org

Peter Bogard
Standards Administrator
+1.703.907.7961
pbogard@tiaonline.org

Ronda Coulter
Standards Administrator
+1.703.907.7974
rcoulter@tiaonline.org

Andrew Dryden
Sr. Manager,
International Standards
+1.703.907.7702
adryden@tiaonline.org

Chenoa Ellison
Standards Assistant
+1.703.907.7486
cellison@tiaonline.org

Teesha Jenkins
Standards Administrator
+1.703.907.7706
tjenkins@tiaonline.org

Florence Otieno
Manager, International Standards
+1.703.907.7556
fotieno@tiaonline.org

Jeffrey West
Sr. Network Manager, 3GPP2
+1.703.907.7730
jwest@tiaonline.org

GOVERNMENT AFFAIRS

Danielle Coffey
Vice President, Government Affairs
+1.202.346.3243
dcoffey@tiaonline.org

Carolyn Holmes Lee
Director, Legislative &
Government Affairs
+1.202.346.3245
clee@tiaonline.org

Nick Fetchko
Director, International &
Government Affairs
+1.202.342.3246
nfetchko@tiaonline.org

Patrick Sullivan
Director, Technical &
Government Affairs
+1.202.346.3244
psullivan@tiaonline.org

Anne Pizzato
Manager, International &
Government Affairs
Phone: +1.202.346.3247
apizzato@tiaonline.org

Rebecca Schwartz
Director, Regulatory &
Government Affairs
+1.202.346.3248
rschwartz@tiaonline.org

Tamara Williams
Staff Assistant
+1.202.346.3240
twilliams@tiaonline.org

EIATRACK

Taly Walsh
Vice President, Marketing &
Business Development
+1.703.907.7744
twalsh@tiaonline.org

Ellen Farmer
Environmental Program Manager
+1.703.907.7582
efarmer@tiaonline.org

Lora Magruder
Director, Member Relations
+1.703.907.7713
lmagruder@tiaonline.org

MARKETING & MEMBERSHIP

Taly Walsh
Vice President, Marketing &
Business Development
+1.703.907.7744
twalsh@tiaonline.org

Lora Magruder
Director, Member Relations
+1.703.907.7713
lmagruder@tiaonline.org

Mike Snyder
Director, Public Relations
+1.703.907.7723
msnyder@tiaonline.org

Florence Sumaray
Director, Marketing
+1.703.907.7471
fsumaray@tiaonline.org

Lois Parks
Manager, Member Relations
+1.703.907.7739
lparks@tiaonline.org

FINANCE

Sandy Afes
Vice President, Finance
+1.703.907.7732
safes@tiaonline.org

Martie Hutto
Controller
+1.703.907.7720
mhutto@tiaonline.org

HUMAN RESOURCES & OFFICE SERVICES

Lisa Maghraoui
Director, Human Resources
+1.703.907.7716
lmaghraoui@tiaonline.org

INFORMATION TECHNOLOGY SERVICES

Bisrat Bainesagn
Senior Network Manager
+1.703.907.7718
bbainesagn@tiaonline.org

Tony Zarafshar
Manager, IT Services
+1.703.907.7775
tzarafshar@tiaonline.org

WEB DEVELOPMENT

Brian West
Director, Interactive Media
+1.703.907.7493
bwest@tiaonline.org

Tuan Nguyen
Senior Web Developer
+1.703.907.7738
tnguyen@tiaonline.org

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. With roots dating back to 1924, TIA enhances 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. TIA co-owns the SUPERCOMM® tradeshow and is accredited by the American National Standards Institute (ANSI). Visit tiaonline.org.

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TIA ADVANCING GLOBAL COMMUNICATIONS

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In today's economy it is especially critical that company executives continue to receive value from TIA's standards program. We are a driving force behind compatibility and interoperability across the global network.

Thousands of communications leaders work through our standards program to enhance the business environment for telecommunications, broadband, mobile wireless, information technology, networks, cable, satellite, unified communications, emergency communications, vehicular telematics and healthcare ICT.

On the surface, many people see TIA's standards work as "all about the technical details," but our work is far-reaching. We enable first responders to communicate in times of crisis; we enable persons with disabilities to have access to communications products and services; and we will enable the "smart car" of the future to monitor and assess road and traffic conditions to get us to our destinations safely.

TIA's Board of Directors considers our standards work to be of primary importance, and we will continue to ensure that these efforts remain timely, relevant and forward-looking. On a global level, our work is important to individual companies, to the overall industry and to the consumer.

TIA's standards program is world-class in every respect. It is accredited by the American National Standards Institute (ANSI); the standards developing process is completely transparent; and any interested party is encouraged to participate.

More than 1,100 subject-matter experts and other industry leaders participate in TIA's 70+ engineering committees, subcommittees, working groups and Technical Advisory Groups (TAGs) and the Third Generation Partnership Project 2(3GPP2). Their collaborative efforts have produced more than 3,500 standards documents. These invaluable reference tools are used by industry and government entities across the globe to help develop numerous products and services.

All of this would not happen without the hard work and long hours put in by our volunteers and the backing of the companies and organizations that allow them to participate. TIA and its Board of Directors applaud these efforts and we thank each and every one of you for supporting our standards program.

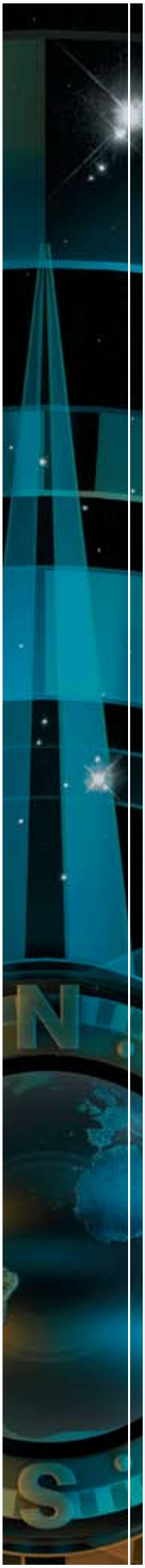
Sincerely,

Shawn Osborne
TIA Chairman

Grant E. Seiffert
TIA President

Shawn Osborne
TIA Chairman

Grant E. Seiffert
TIA President



CONNECTIVITY INNOVATION LEADERSHIP RESPONSIBILITY

These are the Telecommunications Industry Association's core values. TIA's mission is to convert these values into initiatives that benefit our members and the larger global information and communications technology industry.

Our Values Mean Business.

When you join TIA, you gain access, authority, and intelligence designed to help you:

- **Protect your company's interests when standards and policies are being formulated**
- **Engage peers regularly about market challenges or business opportunities**
- **Access timely news, information, and market intelligence**
- **Expand your business to overseas markets efficiently and effectively**
- **Gain a competitive advantage through convergence certification of employees**
- **Take the lead on green initiatives in the information and communications technology industry**

If you manufacture or supply high-tech equipment, products and services used in communications technologies anywhere in the world, you can not afford not to join TIA!

Companies of all sizes benefit from participating in TIA's Standards, Government, Networking, and Market Intelligence and Environmental regulatory and compliance services.

Discover how you can gain a competitive advantage in the broadband economy when leveraging TIA's full range of services by contacting TIA's Membership Department at +1.703.907.7713 or membership@tiaonline.org.

TELECOMMUNICATIONS INDUSTRY ASSOCIATION

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Letter from the TIA Technical Committee Chairman

THIS IS MY SECOND YEAR OF SERVING YOU AS CHAIRMAN OF TIA'S TECHNICAL Committee, and I now have an even greater appreciation for the very hard work being done by 1,100 volunteers and a dozen association staff members creating hundreds of ICT standards.

TIA is a world-class standards developing organization (SDO), fully accredited by the American National Standards Institute (ANSI). We have produced more than 3,500 technical documents since the 1920s and currently have 800 active standards in use globally. I feel privileged to serve the membership by chairing the Board of Directors committee that supports TIA standards work. These standards are ranked very highly by our member companies, government agencies and the industry in general. We are clearly technology and standards thought leaders in the telecommunications industry.

One reason TIA efforts are so well regarded is the association's global involvement through participation in the International Electrotechnical Commission (IEC), International Organization for Standardization (ISO) and the International Telecommunication Union (ITU). U.S. positions are developed by U.S. Technical Advisory Groups (US TAGs) and forwarded to these international bodies. TIA administers four International Secretariats and 16 US TAGs to international committees. The association is also an active partner in the Third Generation Partnership Project 2 (3GPP2) and houses its Secretariat. See the two-page "map" in this report (p. 32) to get a comprehensive view of TIA's worldwide reach with global standards.

My ongoing goals for the TIA Technical Committee:

- Work more closely with other SDOs, fora and consortia to encourage international cooperation and worldwide technical compatibility—particularly with the IEC, ISO, ITU, the Institute of Electrical and Electronics Engineers, the Internet Engineering Task Force, BICSI and the Hearing Loss Association of America.
- Foster even better teamwork between TIA's standards efforts and its policy program, since standards impact policy and trade issues—issues such as emergency response needs, universal service, broadband proliferation, spectrum harmonization and environmentally responsible stewardship of the planet.
- Focus our standards efforts to be more forward-looking and timely—in areas ranging from healthcare ICT and vehicular telematics/intelligent transportation to the green arena, where communications and information technology play such a vital role.
- Facilitate even faster standards development by providing whatever resources are needed—staffing, financial investment and senior executive management.

Technology impacts just about every industry and every consumer. Technical standards are the foundation—the ICT "glue"—of our lives and lifestyles. Many thanks to the more than 1,100 people who are working so diligently under TIA's auspices in the technology arena.

With deepest appreciation,

Charles Kenmore
TIA Technical Committee Chairman

Charles Kenmore
TIA Technical Committee Chairman

TR-8: Mobile and Personal Private Radio Standards

SINCE 1944, ENGINEERING COMMITTEE TR-8 HAS BEEN RESPONSIBLE FOR formulating and maintaining voluntary standards for private radio communications systems and equipment for both voice and data applications. These standards are essential for reliable and interoperable communications systems.

As a result of the work of TR-8 and its 14 subcommittees, first responders can communicate over a variety of communications protocols. The standards being developed by the committee are crucial for the advanced mission-critical communications systems of today and for the future, and TR-8 will continue to play an important role in developing these standards.

The committee addresses all technical matters for systems and services, including definitions, interoperability, compatibility and compliance requirements. The types of systems addressed by these standards include business and industrial dispatch applications as well as public safety (such as police, ambulance and fire fighting) applications.

Much of the work of the committee continues to be the formulation and maturation of standards for Project 25 (public safety/first responder applications) and the development of standards for the Project 34 (broadband data for public safety applications) suite of standards. These are standards projects created with input from the Association of Public Safety Officials (APCO), the National Association of State Telecommunications Directors (NASTD) and agencies of the federal government.

TR-8 develops Project 25 standards, which provide digital communication systems for public safety and first responder applications.

SIGNIFICANT ACCOMPLISHMENTS

TR-8 is the oldest of the TIA standards committees, having been in existence since the early days of the use of two-way land mobile radio. TR-8 has been responsible over the years for the formulation of standards that apply to all forms of private land mobile radio. Traditionally, the standards encompassed systems that employed analog forms of modulation and included such elements as radio performance, signaling systems, antennas, and propagation and interference models. In more recent years, standards for digital radio systems have taken on importance, owing to the need for more spectral-efficient communications systems and the need for interoperability among systems from multiple manufacturers. The standards being developed are crucial for advanced mission-critical communications systems of today and in the future. TR-8 will continue to play an important role in developing standards for such systems.

2008 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 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 issues to equipment measurement and performance, over-the-air protocols and infrastructure wireline interface. Communications systems of this type are used in a variety of applications, including business and industrial applications, transportation systems and public safety applications. They 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. This means that 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 aimed at promoting reliable and interoperable communications systems.

Much of the work of the committee continues to be the formulation and maturation of standards for Project 25 and the development of standards for the Project 34 suite of standards. These are standards projects created by the Association of Public Safety Officials (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 tailored for public safety and first-responder applications. The current Project 25 standards suite consists of 51 documents including 38 TIA standards, 23 of which are ANSI standards, and 13 Telecommunications Systems Bulletins. Project 34 is a standards project aimed at broadband data for public safety applications. The work of TR-8 is somewhat unusual among the various engineering committees, in that there is significant participation by users of the technology as well as manufacturers. 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 an equal 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 additional frequent teleconference calls and face-to-face working sessions. The 2008 quarterly meetings were held in conjunction with the Project 25 and 34 committee meetings. TR-8 makes extensive use of electronic working tools, including electronic distribution of documents at the meetings, and the use of the TIA FTP site for document distribution outside of the meetings.

2008 ACTIVITIES

Subcommittee TR-8.1, Equipment Measurement Procedures, is responsible for the formulation of standards for measurement methods for radio frequency (RF) transmitter and receiver equipment. Within the year, TR-8.1 has published TIA-102.CAAA-C, *Digital C4FM/CQPSK Transceiver Measurement Methods*. In addition, the subcommittee has been drafting an update to TIA-603-C, *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*.

Through the work of TR-8 and its 14 subcommittees, first responders can communicate over a variety of communications protocols.

Subcommittee TR-8.3, Encryption, is responsible for standards relating to encryption. Although no documents were published within the year, drafting work has been done on a block Encryption Protocol standard, which is in the ballot process.

Subcommittee TR-8.4, Vocoders, is responsible for standards relating to vocoders. In 2008, the subcommittee published TSB-102.BABF, *Experiment 3 Test Plan for Vocoder Technology for Project 25 Phase 2*. Two other documents are in the process of being balloted and published.

Subcommittee TR-8.5, Signaling and Data Transmission, is responsible for standards relating to data applications. Within the year, the subcommittee has published TIA-102.BAJB, *Project 25 Tier 1 Location Services*. It is also working on several other documents relating to location services.

Subcommittee TR-8.6, Equipment Performance Recommendations, is responsible for standards relating to transceiver performance. Within the

year, the subcommittee has worked in conjunction with TR-8.1 on the drafting of an update to TIA-603-C, *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*. The subcommittee is also working on drafting an update to TIA-102.AAB-B for transceiver performance.

Subcommittee 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 relatively dormant, as much of the initial drafting work for this effort is occurring in task group meetings.

Subcommittee TR-8.10, Trunking and Conventional Control, is responsible for standards relating to trunking systems. Much of the subcommittee's work is to revise and update many of the Project 25 trunking standards. A third addendum to TIA-102.AABC-B, *Trunking Control Channel Messages Addendum for ISSI Supplementary Data,* and a third addendum to TIA-102.AABF-A, *Link Control Word Formats and Messages Addendum for ISSI,* have been published. Four other documents are in the ballot or publication process.

The standards being developed are crucial for advanced mission-critical communications systems of today and in the future.

Subcommittee TR-8.11, Antennas, is responsible for formulation of standards for antennas and antenna subsystems. Within the year, the subcommittee published TIA-329.2-C, *Minimum Standards for Communications Antennas, Vehicular Antennas*. An addendum to TIA-804-B, *Antenna Digitized Data Pattern Format Addendum 1: XML* was also published.

Subcommittee TR-8.12, Two-Slot TDMA Systems, is responsible for formulation of standards for two-slot TDMA systems. The subcommittee has taken on two of the two-slot TDMA documents, which they have taken to ballot. An additional document is expected to be balloted in 2009.

Subcommittee TR-8.15, Common Air Interface, is responsible for formulation of standards for the air interface for Project 25 systems. The subcommittee has published an addendum to TIA-102.BAAD, *Common Air Interface Description for Conventional Channels Addendum 1 – Packet Data Registration/OTAR Messages and Procedures*. In addition, the subcommittee has three documents in the ballot or publication phase.

Subcommittee TR-8.17, Radio Frequency (RF) Exposure, is responsible for standards relating to testing, reporting and labeling issues regarding RF exposure limits. The subcommittee has worked on drafting TSB-92-A, *Report on EME Evaluation for RF Cabinet Emissions under FCC MPE Guidelines,* which is in the publication process.

Subcommittee TR-8.18, Wireless Systems Interference and Coverage, deals with issues relating to radio propagation and interference. Within the year, the subcommittee has published an addendum to TIA-845-A, *Radio Wave Propagation Path Loss Measurement Presentation Format.* The subcommittee has also published TSB-88.1-C, *Wireless Communications Systems Performance in Noise and Interference Limited Situations Part 1: Recommended Methods for Technology Independent Performance Modeling*. Two other documents are in the publication phase.

Subcommittee TR-8.19, Wireline Systems Interface, is responsible for standards for radio system network interfaces. Within the year, the subcommittee has published three standards:

TIA-102.BACD-A, *Project 25 Inter-RF Subsystem Interface Messages and Procedures for Supplementary Data Services;* TIA-102.BACE, *Project 25 Inter-RF Subsystem Interface (ISSI) Messages and Procedures for Conventional Operation;* and TSB-102.BAGA, *Project 25 Console Subsystem Interface Overview.* It has also published TIA-102.CACA-1, *Project 25 Inter-RF Subsystem Interface Measurement Methods for Voice Services – Addendum 1 Trunked Console ISSI;* and TIA-102.CACB-1, *Project 25 Inter-RF Subsystem Interface (ISSI) Performance Recommendations for Voice Service – Addendum 1 Trunked Console ISSI.* One additional document is in the publication process.

Subcommittee TR-8.25, Compliance Assessment, is responsible for standards for compliance assessment and interoperability issues. Within the year, the subcommittee has published TIA-102.CABC-A, *Project 25 Interoperability Testing for Voice Operation in Trunked Systems.* In addition, nine documents are in the publication process.

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

TR-8: MOBILE AND PERSONAL PRIVATE RADIO STANDARDS

CHAIR, TR-8: JOHN OBLAK
EF Johnson Technologies

VICE-CHAIR, TR-8: ALAN WILSON
Tyco Electronics

SUBCOMMITTEES

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

TR-8.3 Encryption
CHAIR: David VanderStaay, *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.*

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CHAIR: Ronald Jakubowski, *TX RX Systems, Inc.*

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CHAIR: Ernest Hofmeister, *Tyco Electronics*

TR-8.15 Common Air Interface
CHAIR: Alan Wilson, *Tyco Electronics*

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CHAIR: Robert Speidel, *Tyco Electronics*

TR-8.18 Wireless Systems Interference and Coverage
CHAIR: Bernie Olson, *Motorola, Inc.*

TR-8.19 Wireline Systems Interface
CHAIR: Jerry Drobka, *Motorola, Inc.*

TR-8.25 Compliance Assessment
CHAIR: Tess Zagaruyka, *Datron World Comm. Div.*

TR-8 COMMITTEE PARTICIPANTS

Aeroflex, Agilent Technologies, Inc., Alcatel-Lucent, Analog Devices, Inc., APCO Project 25, Aselsan Inc., AT&T, Cisco Systems, Inc., City of Mesa, Comm. Div., CML Microcircuits (USA) Inc., CoCo Comm. Corp., CommScope Network Solutions, CSI TeleComm., Inc., CTA Comm., Inc., Daniels Electronics Ltd., Datron World Comm. Div., Digital Voice Systems, Inc., EF Johnson Technologies, EADS Public Safety Inc., Ericsson, Inc., Etherstack, FRYE-COMM Consulting LLC, General Dynamics C4 Systems, Harris Corp., Icom America Inc., Industry Canada, Kenwood USA Corp., Lockheed Martin Corp., M/A-Com, Inc., Microtronix Systems Ltd., Motorola, Inc., National Technical Systems (NTS), NIST-OLES, Nokia Inc., Nortel Networks, Oregon State Police/SAFECOM, RELM Wireless Corp., RTKL Associates Inc., Samdale Limited, Sigma Delta Comm., Inc., Sony Wireless Tech Division, Space Data Corp., Tait Radio Comm., Technisonic Industries Ltd., Telchemy Inc., Telex Comm., Inc., Texas Instruments, Inc., Thales Comm., Inc., TX RX Systems, Inc., Tyco Electronics, U.S. Dept. of Commerce, U.S. Dept. of Homeland Security, Widevine Technologies, Inc., 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 standards allow carriers to effectively and reliably relay communications via antenna towers. TR-14.7's newly-formed *Structural Reliability Task Group* is dealing with structural performance and reliability issues pertinent to the structures utilized by 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.

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.

TR-14.7 continues to 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 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 objective of the 222 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 standard provides the requirements for structural design and fabrication of new, and modification of existing, structural antennas, antenna-supporting structures, mounts, structural components, guy assemblies, insulators and foundations.

2008 OVERVIEW

During 2008, the TR-14.7 subcommittee developed Addendum 2 to Revision G for publication in 2009. Addendum 2 will include refinements based on recent changes in the reference standards used as the basis for Revision G. Clarifications will be made in some sections based on user inquiries for interpretations and the subcommittee's desire to provide additional clarification on the standard. Minor editorial changes will be included in Addendum 2. The subcommittee also continued to be active during the past year fielding technical questions on Revision G and the newly-released Addendum 1.

TR-14.7 also 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 address specialized equipment such as gin poles, frames, hoists and the temporary supports necessary to safely complete

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
Aero Solutions, LLC

VICE-CHAIR, TR-14:
JOHN ERICHSEN
EET LLC

SUBCOMMITTEE

TR-14.7 Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
CHAIR: Brian Reese, *Aero Solutions, LLC*
VICE-CHAIR: John Erichsen, *EET LLC*

TR-14 COMMITTEE PARTICIPANTS

4SE Inc., Aero Solutions, LLC, Aluma-Form, Inc., American Tower Corp., AT&T Mobility, B&T Engineering, Inc., Bechtel Telecom., Black & Veatch Telecomm., Broadcast Tower Technologies, Inc., C. Faulkner Engineering, CMX, Crown Castle Int'l Corp., CSI TeleComm., Inc., Davidson Engineering, LLC, DaVinci Engineering Inc., EET LLC, Ehresmann Engineering, Inc., Electronics Research, Inc., Engineered Endeavors, Inc., FWT, Inc., Genivar, LP, Glen Martin Engineering, Global Tower Partners, Industrial Engineering & Testing, Industry Canada, KCI Technologies, Inc., Malouf Engineering Int'l, MLD Engineering Solutions, Inc, Nello Corporation, NTIA, Paul J. Ford and Company, Power Line Systems, Inc., Radian Communications Services, Rohn Products, RISA Technologies, RTKL Associates Inc., Sabre Towers & Poles, Shively Labs, Sioux Falls Tower Specialists, Stainless LLC, Stealth Concealment Solutions, Inc., Tower Consultants, Inc., Tower Engineering Professionals, Tower Technology, U.S. Dept. of Commerce, Valmont Comm., Valmont-PennSummit, Walker Engineering Inc., Weisman Consultants, WesTower Comm. Inc.

those tasks, along with the design requirements for a gin pole. It 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 entitled *Structural Standards for Installation, Alteration and Maintenance of Communication Towers, Antennas and Antenna Supporting Structures*.

TR-14.7's newly-formed *Structural Reliability Task Group* is addressing 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.

Subcommittee goals for 2009 include publishing Addendum 2 to TIA 222-G and continued work on TIA-1019.

TR-14.7's newly-formed Structural Reliability Task Group is addressing structural performance and reliability issues pertinent to the structures utilized in the telecommunications industry.

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

SINCE 1958, ENGINEERING COMMITTEE TR-30 HAS BEEN RESPONSIBLE FOR developing voluntary 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.

The committee is comprised of three subcommittees addressing modems and facsimile systems, data transmission interfaces and protocols, and data communications equipment evaluation and transmission interfaces. These subcommittees have produced numerous standards for data, facsimile and telecommunications equipment.

Among the many accomplishments of TR-30 is the development of standards that enable those with disabilities to better communicate. TIA-825-A, *A Frequency Shift Keyed Modem for Use on the Public Switched Telephone Network*, was developed for use in 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.

On the international front, TR-30 provides many technical contributions to the work taking place in ITU-T Study Groups 12, *Performance, QoS and QoE,* and 16, *Media coding, systems and applications.* Many of these contributions become U.S. contributions to the ITU-T work through the U.S. Department of State International Telecommunications Advisory Commerce process. In addition to technical contributions, liaisons have been established with a number of the ITU-T study groups.

TR-30 standards enable those with disabilities to communicate better.

SIGNIFICANT ACCOMPLISHMENTS

During its 50 years of existence, TR-30 has produced numerous standards for data, facsimile and telecommunications equipment. Dating back to 1962, the RS-232 standard (now TIA-232-F) 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 specifically developed for use in 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 standards that provide for 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 Protocol.*

TR-30 provides the U.S. input to the ITU-T development of its recommendations. TR-30 has provided the primary input for this work since its inception.

2008 OVERVIEW

TR-30 and its subcommittees had another active year in 2008. Each subcommittee had its own goals for the year, which were met. TR-30.1 completed the approval processes for TIA-1113, *Medium-Speed (up to 14 Mbps) Power Line Communications (PLC) Modem* and TIA-1001-A, *Transport of TIA-825-A Signals over IP Networks.* TR-30.2 continued to maintain the many

interface standards under its oversight. TR-30.3 completed 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 Groups 12, *Performance, QoS and QoE,* and 16, *Media 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 Telecommunications Advisory Committee process. In addition to technical contributions, liaisons have been established with a number of the ITU-T study groups.

2008 ACTIVITIES

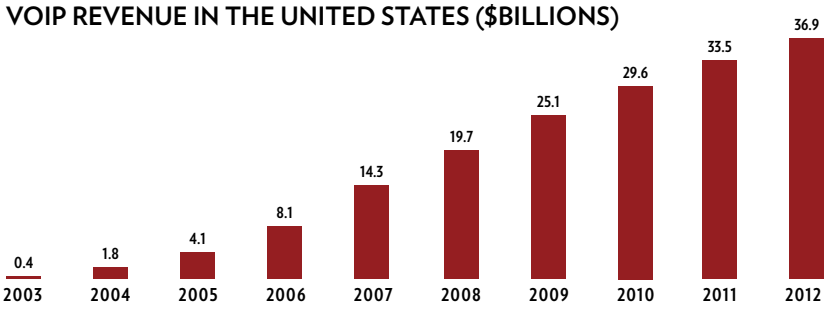
Subcommittee TR-30.1, Modems, had an active year with the final approval of TIA-1113, *Medium-Speed (up to 14 Mbps) Power Line Communications (PLC) Modem.* TR-30.1 also completed the revision of TIA-1001-A, *Transport of TIA-825-A Signals over IP Networks,* to align it with ITU-T Recommendation V.151. This subcommittee continues to work very closely with ITU-T Study Groups 16/Question 14, *Voiceband modems: specification, performance evaluation and interworking with NGN* and 26, *Accessibility to multimedia systems and services.*

During 2008 TR-30.1 also reaffirmed the following standards:

- TIA-825-A, *A Frequency Shift Keyed Modem for Use on the Public Switched Telephone Network*
- TIA-668-A, *High Frequency Radio Facsimile*
- TIA-605, *Facsimile DCE-DTE Packet Protocol Standard*

Subcommittee TR-30.2, DTE-DCE Interfaces, TR-30.2 worked in maintenance mode during 2008. The subcommittee reaffirmed the following standards and bulletin:

- TIA-574, *9-Position Non-Synchronous Interface Between Data Terminal Equipment and Data*



Circuit-Terminating Equipment, Including Alternative 26-Position Connector

- TIA-723, *High Speed 232 Type DTE/DCE Interface*
- TIA-485-A, *Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems*
- TIA-688, *DTE/DCE Interface for Digital Cellular Equipment*
- TSB-89, *Application Guidelines for TIA/EIA-485-A.*

Subcommittee TR-30.3, Data Communications Equipment Evaluation and Network Interfaces, continues to focus on improving and revising ANSI/TIA-921-A, *Network Model for Evaluating Multimedia Transmission Performance over Internet Protocol* and the ITU-T version Recommendation G.1050. The revision of TIA-921 to TIA-921-A was completed early in 2008. TR-30.3 is now concentrating its efforts on another revision of the standard with four primary objectives: reduction in the number of test cases, algorithm modifications, an annex to verify model conformance and an annex providing guidelines to the application of the standard. TR-30.3 provides inputs to ITU-T Study Group 12, where similar work is being done.

TR-30.3 also completed and approved a revision to TSB-38-*A, Test Procedure for Evaluation of 2-Wire 4-KHz Voiceband Duplex Modems*.

To find out more about participating in TR-30, please contact Ronda Coulter: rcoulter@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: Keith Chu, *Mindspeed Technologies*

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

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

TR-30 COMPANY PARTICIPANTS

ADTRAN, Airvana, Inc., Analog Devices, Inc., Anue Systems, Berk-Tek, Broadcom Corp., Cisco Systems, Inc., CSI TeleComm., Inc., FAL Associates, Flykees, Gemalto Inc., Intel Corp., Intellon, LSI Corp., Mindspeed Technologies, Motorola, Inc., Nokia Siemens Networks, Nortel Networks, PacketStorm Comm., Inc., Panasonic Computer Solutions Co., Sony Wireless Tech Div., Spirent Communications, Telchemy, Inc., Telcordia Technologies, Inc., Texas Instruments, Inc.

TR-34: Satellite Equipment and Systems

SINCE 1995, ENGINEERING COMMITTEE TR-34 HAS BEEN RESPONSIBLE FOR developing voluntary standards related to satellite communications systems, including both the space and earth 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.

The TR-34.1 subcommittee addresses inter-service spectrum sharing for achieving interoperability between satellite systems, as well as among 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 provide an introduction to the physical layer specification for the Satellite Earth Station 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 between TIA and the European Telecommunications Standards Institute (ETSI) SES BSM, which resulted in the standard on Connection Control Protocol C2P protocol activities.

The committee focuses on standards for space-borne and terrestrial hardware.

SIGNIFICANT ACCOMPLISHMENTS

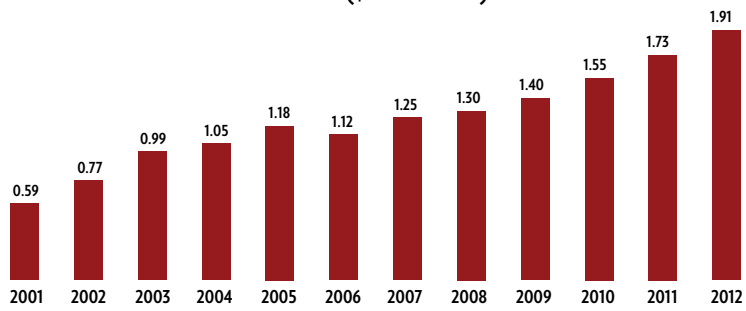
TR-34 committee was first convened in 1995. The key suite of documents developed is the Regenerative Satellite Mesh-A (RMS-A) Air Interface. This suite of standards, in the TIA-1040 series, provides an introduction to the physical layer specification for the SES BSM RSM-A air interface family. It consists 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 within the ETSI SES and BSM, which resulted in the standard on Connection Control Protocol (C2P) activities. TIA-1073.002, *Satellite Network Modem System (SNMS) Encryption Requirements,* 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 standards also support 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 within IPv4 and IPv6 network-layer protocols. This mechanism will allow 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" and requires routers. Thus, QoS is set up in real time across the network without a separate, out-of-band, software signaling structure like Reservation Protocol (RSVP). The resource "request" and (when needed) the "response" messages are incorporated into the user data packets themselves, allowing the QoS requirements to be set up during the initial network traversal from sender to receiver (and back if needed), streamlining the packet management process.

2008 OVERVIEW

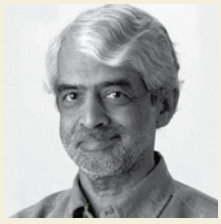
TR-34 and its subcommittee continued joint activity between TIA and ETSI with respect to mobile satellite communications, including the



Source: *TIA's 2009 ICT Market Review and Forecast*

To find out more about participating in TR-34, please contact Ronda Coulter: rcoulter@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., CSI TeleComm., Inc., Gilat Satelitte Networks Ltd., Globalstar, Hughes Network Systems, LLC, Lockheed Martin Corp., RTKL Associates Inc., Space Data Corp., Telcordia Technologies, Inc., University of Maryland, ViaSat, Inc.

joint publication of the GMR-1 3G satellite air interface standard.

2008 ACTIVITIES

Subcommittee TR-34.1, Communications and Interoperability, held one meeting in February 2008. This group routinely meets at TIA headquarters in Arlington, Va. In order to advance joint publication with ETSI, the group met with ETSI Satellite Earth Station Systems (SES) Broadband Satellite Multimedia (BSM) in the development of ETSI TS 102-602, *Satellite Earth Stations and Systems (SES); Broadband Satellite Multimedia (BSM), Connections Control Protocol (C2P) for DVB-RCS Specifications* and ETSI TR 102-603 *Satellite Earth Stations and Systems (SES), Broadband Satellite Multimedia (BSM), Connections Control Protocol (C2P) for DVB-RCS Background Information.*

In 2009, the TR-34.1 subcommittee looks forward to additional joint activity between TIA and ETSI with respect to mobile satellite communications, including the joint publication of the GMR-1 3G standard. This standard will be a new addition to the ITU IMT 2000 mobile satellite air interfaces supporting S-UMTS or third-generation services. TR-34.1 is also establishing a formal liaison with ETSI DVB-RCS to support the next-generation version of their standard, which is in process.

TR-41: User Premises Telecommunications Requirements

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. The committee's work involves developing 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.

With more than 20 subcommittees, 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. TR-41 also develops criteria for preventing harm to the telephone network, which become mandatory when adopted by the Administrative Council for Terminal Attachments (ACTA).

Among the many accomplishments of TR-41 is the release of TIA-1083 *Telecommunications Telephone Terminal Equipment Handset Magnetic Measurement Procedures and Performance*. This standard was developed specifically to improve accessibility for the hearing impaired by establishing performance requirements and measurement methods to reduce noise caused by magnetic interference between cordless telephones and T-Coil-equipped hearing aids or Cochlear implants.

Several wireline cordless telephone manufacturers have voluntarily agreed to make their products compliant with TIA-1083 no later than the beginning of 2010. Boxes on store shelves for cordless telephones that comply with TIA-1083 display a special mark so consumers can easily identify the products as "hearing-aid friendly."

TR-41.3 member companies participate in the annual Hearing Loss Association of America (HLAA) convention to demonstrate TIA-1083 compliant products.

SIGNIFICANTACCOMPLISHMENTS

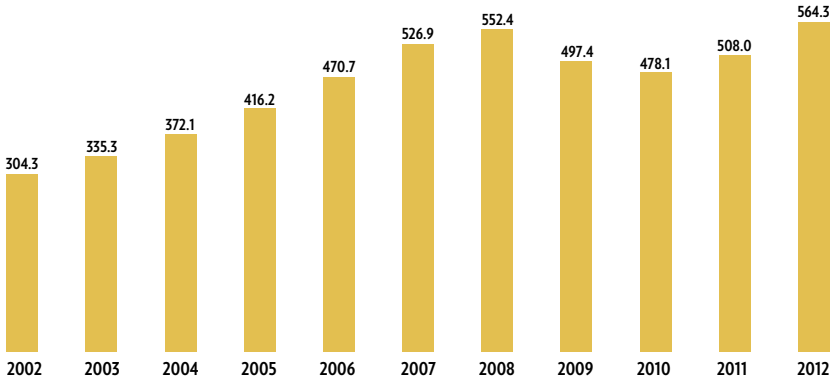
TR-41 was formed in 1976 under the Engineering Department of the Electronic Industries Association. Among its first products were Recommended Standards RS-464 on PBXs, RS-470 on telephones and RS-504 on hearing aid compatibility. The latter was adopted verbatim as Part 68.316 of the FCC Rules. Other standards that followed include EIA/TIA-571 on environmental considerations, TIA/EIA-596 on network channel terminating equipment, TIA/EIA-631 on RF immunity, TIA/EIA-777 on caller ID performance, TIA/EIA-810 and TIA-920 on narrowband and wideband voice performance of digital telephones, TIA/EIA-811 on VoIP feature telephones and TIA-1003 on wireless LAN IP telephony endpoints. Many of these documents have 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. TIA-1083, a much-improved hearing aid compatibility standard, was adopted in 2007, and the major wireline cordless telephone manufacturers have voluntarily agreed to make their products compliant with the standard no later than the beginning of 2010.

2009 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. Several projects involving revisions to existing standards are either in the final stages of the drafting work, or have already been approved for submission to ballot and should

ENTERPRISE AND CONSUMER TELECOMMUNICATIONS REVENUE IN THE UNITED STATES ($BILLIONS)



Source: *TIA's 2009 ICT Market Review and Forecast*

be completed in the first half of 2009. This will allow additional projects that have been on hold awaiting resources in terms of individuals and meeting time slots to kick off. In particular, the TR-41.3.5 Working Group is being reconstituted to revise the TIA-470.110-C standard on transmission performance of handset-equipped analog telephones. Among other things, the group will be addressing the proper measurement of receive-volume gain claimed by a number of products targeted to individuals with hearing loss.

2008 ACTIVITIES

TR-41 held four week-long meetings with its subcommittees and working groups in 2008. Additional interim meetings were conducted via teleconference as needed. A recognition event held in conjunction with the May meeting acknowledged the contributions to published TIA standards made by 26 different individuals.

TR-41 exchanged liaison information with a number of standards bodies, councils and associations during 2008 including ACTA, the Alliance for Telecommunications Industry Solutions (ATIS) Network Interface, Power and Protection Committee (NIPP), the Hearing Loss Association of America (HLAA), Industry Canada's Terminal Attachment Program Advisory Committee (TAPAC), the Telecommunication Certification Body (TCB) Council, Underwriters Laboratories (UL) and the TR-42 Engineering Committee. The Institute of Electrical and Electronics Engineers (IEEE) Subcommittee on Telephone Instrument Testing (STIT) collocated with the TR-41.3 working groups for two meetings so joint meetings could occur.

Subcommittee TR-41.3, Analog and Digital Wireline Terminals, followed its 2007 publication of TIA-1083, *Handset Magnetic Measurement Procedures and Performance Requirements,* by opening a project to develop an amendment covering test procedures for products with a digital interface, such as VoIP telephones. TSB-177, describing a logo to be placed on the packaging of TIA-1083-compliant phones, was published in May, and major manufacturers completed a license agreement with TIA for use of the logo and began marking their products. TR-41.3 member companies Panasonic, Uniden and VTech again participated in the annual HLAA convention by demonstrating 1083-compliant products and getting the message out to look for the logo on boxes in stores beginning in early fall.

While the draft amendment to TIA-1083 was under development, it was discovered that further investigation of the indirect method proposed for establishing an input signal level equivalent to that used for telephones with analog interfaces was needed. A minor technical error was also discovered in a part of the test procedure copied from the base document. As a result, the addendum project was abandoned in favor of doing a revision to the base document. The issue of defining an appropriate input test signal has been resolved, and publication of TIA-1083-A covering telephones with both analog and digital interfaces is anticipated by mid-2009.

TIA-470.130-C, *Transmission Requirements for Analog Telephones with Headsets,* was published in April 2008. Work on adding documents dealing with speakerphones and answering systems to the 470-C series continued, with an expectation that at least the speakerphone document would be going to ballot in early 2009. Work has also started on the "D" version of many of the 470 subdocuments, with the TIA-470.000-D overview, TIA-470.210-D covering resistance and impedance, and TIA-470.310 on cordless telephone range measurement procedures submitted for ballot.

A decision was made to expedite the revision of TIA-920, *Transmission Requirements for Wideband Digital Wireline Telephones,* by breaking it into subdocuments similar to those in the 470-C series. This should result in the handset and headset portions going to ballot in 2Q-09. The TIA-777-A *Caller ID* standard was submitted for reaffirmation ballot and the project to revise the TIA-855 *Stutter Dial Tone* standard is continuing. There was also continuing liaison activity with ATIS NIPP-NAI concerning the impedance effects of DSL splitters and filters on telephone sidetone and possibly on the reception of Caller ID signaling.

Subcommittee TR-41.4, IP Telephony Infrastructures, resolved comments from TIA's legal department on TIA-1003, *Requirements for a Wireless LAN Based IP Telephony Endpoint* and submitted the document for publication following its February meeting. Since no new work activities have been identified by the group in the past year despite repeated attempts to do so, it was decided that TR-41.4 would go inactive following that meeting.

As a result, some ongoing maintenance activities to reaffirm several documents were turned over to TR-41 for completion. These include TIA-464-C, *Requirements for PBX Switching Equipment,* and its TIA-464-C-1 addendum; TIA-596, *Network Channel Terminating Equipment for Public Switched Digital Service;* and TSB-32-A, *Overall Transmission Plan Aspects for Telephony in a Private Network.*

Subcommittee TR-41.7, Environmental and Safety Considerations, followed up with Underwriters Laboratories (UL) concerning the outline of investigation created from the white paper on *Low-Voltage Surge Withstand Telecommunications Overcurrent Protector Components* developed by the TR-41.7.5 working group and submitted to UL in 2007. The working group reviewed and provided comments on both the draft document and the published version as participants gained experience with its use. The group also kicked off work on a new project to develop a Telecom Circuit Overcurrent Protectors Application Guide to be published as a TSB. A preliminary draft was completed and publication is expected in mid-2009.

TIA-1083 Compliance logo

The TR-41.7.1 working group took note of issues with the limits for receive acoustic limiting that have been included in UL 60950-1 and proposed for adoption in the new IEC 62368 standard now under development. Lack of detail concerning the measurement reference points for various types of artificial ears (ear drum, entrance to the ear canal, etc.) has resulted in erroneous application of the limits in some cases. A proposal was developed for setting fixed reference points for the specification of limits regardless of the type of artificial ear used and for requiring translation of measurement results to those reference points. This proposal was submitted as liaison input to both UL and the US TAG for IEC 63368.

TR-41.7.1 once again submitted liaison comments to UL regarding a formal proposal to add a "candle flame" test to UL-60950-1. TR-41.7.1 has reviewed a number of similar proposals over the past few years and has continued to express serious concerns regarding the lack of substantiation or rationale for the test. Fires due to unattended candles left burning are a serious issue, but claims that they cause plastic housings of electronic equipment such as telephones to ignite and add substantial fuel to such fires are not well documented. In addition, the fire retardants that must be added to plastic materials so they do not catch fire when a candle flame is applied have serious environmental consequences. Several other groups voiced similar concerns to UL about the proposal and it was rejected.

A ballot to reaffirm TIA-631-A, *Radio Frequency Immunity Requirements,* resulted in a negative vote because of outdated references. It was also observed that the document provides test procedures only for telephones with handsets and that limitation should be clearly stated in its scope. As a result, the standard will be revised to fix these two issues. In addition, an informative annex will be added to provide guidance on how the test procedures may be modified to cover other products such as speakerphones, telephones with headsets and answering systems.

Subcommittee TR-41.9, Technical and Administrative Regulatory Considerations, continued its FCC Part 68-related work of creating updates to technical criteria for preventing harm to the network. Relatively minor revisions of two documents were submitted to ACTA, and the revisions were adopted in the May time frame. The submissions were TIA-1096-A, *Connector Requirements for Connection of Terminal Equipment to the Telephone Network, and* TIA-168-B, *Labeling Requirements*. The TR-41.9.1 work on a major revision to roll up all five addenda into the TIA-968-A standard and restructure it along the lines of interface types was completed and submitted for industry ballot. After resolution of ballot comments, the standard should be published by mid-2009 as TIA-968-B, *Technical Requirements for Connection of Terminal Equipment to the Telephone Network*.

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

TSB-31-C, *Rationale and Measurement Guidelines for U.S. Network Protection,* which was completed in 2007, was published, and an associated "test builder" spreadsheet tool for creating lists of relevant tests for various types of products was made available. An amendment, TSB-31-C-1, was created and published to provide additional clarification of the hearing aid compatibility and receive volume-control test procedures for products with digital interfaces such as VoIP telephones. TR-41.9 also kicked off work to revise TSB-129-A, *U.S. Network Connections Regulatory Approval Guide*.

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 Web site; they can also be reached via a link from the ACTA Web site. The additions include information related to hazardous voltages and leakage currents, hearing aid compatibility (HAC) for VoIP phones and clarification on the reason for limiting the number of DTMF digits that can be dialed using one button push. TR-41.9 has also assembled a glossary of terms found in its documents and will make the glossary available via a link from its TIA Web page. In addition, feedback was provided to ACTA concerning a checklist used by the American National Standards Institute (ANSI) in evaluating Telecommunication Certification Bodies (TCBs).

At the November meeting, Roger Hunt of Thomson announced that his company had decided to terminate its North American telecom design activities and that he would not be able to continue as TR-41.9.1 chair and TR-41.9.1 vice-chair.

TR-41: USER PREMISES TELECOMMUNICATIONS REQUIREMENTS

CHAIR, TR-41: STEPHEN R. WHITESELL
VTech

VICE-CHAIR, TR-41: AL BAUM
Uniden America Corp.

SECRETRARY, TR-41: PHILLIP HAVENS
Littelfuse, LP

SUBCOMMITTEES

TR-41.3 Analog and 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 Inc. (UL)*
VICE-CHAIR: Phillip Havens, *Littelfuse Inc.*

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

TR-41 COMMITTEE PARTICIPANTS

4-WINDS LLP, ADTRAN, Advent Instruments, Inc., Allied Telephone and Data Corp., AST Technology Labs, Inc, AT&T Labs, Avaya, Belden Networks Div., Berk-Tek, Bourns Limited, Broadcom Corp., Business Comm. Svcs., Cisco Systems, Inc., CML Microcircuits (USA) Inc., CommScope Network Solutions, Corning Inc., CSI TeleComm., Inc., Dietrich Lockard Group, Inc., EMBARQ Corp., Ericsson Inc., FAL Associates, Fluke Networks, Flykees, Fultec Semiconductor Inc., G.R.A.S. Sound & Vibration, Gemalto Inc., Industry Canada, Intel Corp., Intertek Testing Services, Intrado, ITW Linx, Kyocera Sanyo Telecom, Inc., Littelfuse Inc., LSI Corp., Microtronix Systems Ltd., Motorola Inc., National Comm. System, National Technical Systems (NTS), NeuStar Inc., Nokia Siemens Networks, Nortel Networks, Panasonic Computer Solutions Co., Panasonic Service & Technology Co., Panduit Corp., Plantronics, RTKL Associates Inc., Sharp Laboratories of America, Sigma Delta Comm., Inc., SOC America, Inc., Sony Wireless Tech Div., Spirent Comm., Sprint Nextel, Telchemy, Inc., Telcordia Technologies, Inc., Texas Instruments, Inc., The Siemon Co., Thomson Inc., Tyco Electronics, U.S. Dept. of Commerce, Underwriters Laboratories Inc. (UL), Uniden America Corp., Uniden Engineering Services, Verizon Comm., Verizon Wireless, VTech, Wiltec Technologies

TR-42: Premises Telecommunications Cabling

SINCE 1999, ENGINEERING COMMITTEE TR-42 HAS BEEN RESPONSIBLE FOR developing and maintaining voluntary telecommunications standards for telecommunications cabling infrastructure in user-owned buildings, such as commercial buildings, residential buildings, homes, data centers and industrial buildings. The committee's standards work covers requirements for copper and optical fiber cabling components (such as cables, connectors and cable assemblies), installation and field testing, in addition to the administration, pathways and spaces to support the cabling.

If you've accessed the Internet, connected to someone via a webcam, used a Voice over Internet Protocol (VoIP) phone system, or downloaded digital music or video files, then the documents of TR-42 helped make that possible. The road to IP convergence is paved with the cabling standards from TR-42.

TR-42 and its nine subcommittees created the ANSI/TIA-568 standards, which address the performance and requirements for telecommunications cabling (phone), data cabling (Ethernet) or both (VoIP), in commercial and customer-owned buildings.

In 2008, TR-42 created a new standard: ANSI/TIA-568-C.0, *Generic Telecommunications Cabling for Customer Premises,* which was released for publication. This publication creates a foundation for three types of documents (common standards, premises standards and component standards) and now becomes the TR-42 standard covering cabling topologies, design, distances and outlet configurations, as well as specifics for cabling infrastructure in all locations.

TR-42 continually addressed new technologies such as 10Gb Ethernet and Power over Ethernet.

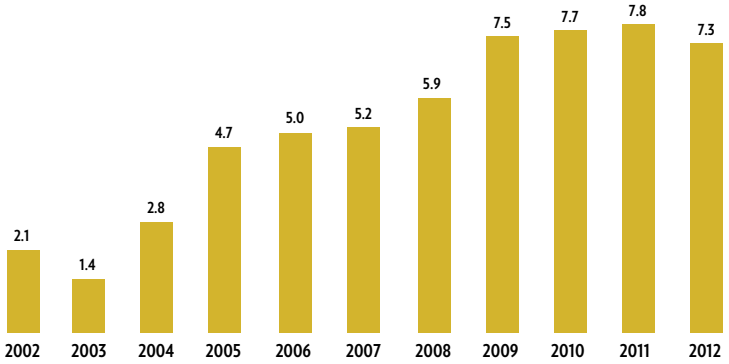
SIGNIFICANT ACCOMPLISHMENTS

TR-42 is most recognized as the creator of the ANSI/TIA-568 standards that address the performance and requirements for telecommunications cabling (phone), data cabling (Ethernet) or both (VoIP), in commercial and customer-owned buildings. Other documents address specific types of customer-owned buildings, such as data centers (the very popular ANSI/TIA-942) and office-oriented buildings (ANSI/TIA-568-C.1). Additionally, component standards for optical fiber (ANSI/TIA-568-C.3) cabling, published in 2008, and for balanced twisted-pair copper (ANSI/TIA-568-C.2), are due for release in 2009. Several ancillary documents covering pathways, spaces (TIA-569-B) and building automation systems (ANSI/TIA-862) are due for release.

2008 OVERVIEW

TR-42 completed several significant steps to improve the suite of documents and the process for those documents in 2008. Chief among them was the creation of a new standard, ANSI/TIA-568-C.0, *Generic Telecommunications Cabling for Customer Premises,* which was released in 2009. This document creates a foundation for three types of documents (common standards, premises standards and component standards) and now becomes the TR-42 standard covering cabling topologies, design, distances and outlet configurations, as well as specifics for cabling infrastructure in all locations. It becomes the standard to reference when more specific documents are not available or appropriate. It also becomes the foundation for those more specific documents, which can now focus on the exceptions and allowances appropriate for the specific type of premise. As an example, the ANSI/TIA-568-C.1 Standard, *Commercial Building Telecommunications Cabling,* builds on the 568-C.0 Standard, listing the appropriate exceptions and allowances for office-oriented commercial building cabling. It was released with 568-C.0. Similarly, ANSI/TIA-568-C.3, *Optical Fiber Cabling*

FIBER INFRASTRUCTURE REVENUE IN THE UNITED STATES ($ BILLIONS)



Source: *TIA's 2009 ICT Market Review and Forecast*

Components, was released in 2008, and ANSI/TIA-568-C.2, *Balanced Twisted-Pair Telecommunications Cabling and Components,* is expected in 2009, completing the third revision of the 568 standard. TR-42 absorbed the TIA FO-4 plenary and subcommittees (now TR-42.11, TR-42.12, TR-42.13 and TR-42.15) and created a new subcommittee, TR-42.16, covering bonding and grounding documents. At the same time, TR-42 continually addressed new technologies such as 10 Gigabit Ethernet and Power over Ethernet. New subjects being addressed in 2009 include cabling for healthcare facilities, incorporation of green initiatives and revision of existing documents to recognize the 568C.0 Standard, as well as other new technologies. TR-42 expects to publish several new standards and revisions in 2009.

2008 ACTIVITIES

Subcommittee TR-42.1, Generic Telecommunications Cabling and Premise Cabling, completed publication of the ANSI/TIA-568C.0 Standard, *Generic Telecommunications Cabling for Customer Premises,* and the ANSI/TIA-568C.1, *Commercial Building Telecommunications Cabling Standard,* setting the stage for the reorganization of the TR-42 suite of documents.

In 2009, the subcommittee will continue work on addenda for the ANSI/TIA-942 data center standard, the creation of a TSB for the MICE (Mechanical, Ingress, Climatic and Chemical, and Electromagnetic) classification tutorial, revision of TIA-862 BAS, *Building Automation,* as well as the creation of a new health care facilities standard.

Subcommittee TR-42.2, Residential Telecommunications Infrastructure, completed development of a broadband coaxial cabling addendum to ANSI/TIA-570-B, the residential telecommunications infrastructure standard.

The subcommittee also began looking at a new opportunity for multi-dwelling/multi-tenant units (MDU/MTU) along with TR-42.12 and TR-42.13 in joint meetings. It is expected that a project will begin officially in 2009.

Subcommittee TR-42.3, Commercial Building Telecommunications Pathways and Spaces, continued work on a pathways and spaces addendum to ANSI/TIA-1005, *Industrial Telecommunications Infrastructure.* Recognizing modifications in American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) recommendations, the subcommittee started a project for an addendum to TIA-569-B, *Commercial Building Standard for Telecommunications Pathways and Spaces.* These changes should harmonize the TIA HVAC requirements with ASHRAE recommendations as part of its "green initiative" effort. To address the growing green consciousness, a Green Study Group was established in TR-42.3 to provide recommendations on green-related content for future TR-42 standards and revisions.

The release of ANSI/TIA-568-C.0, TR-42.3 began the revision of TIA-569. The revision will broaden its scope beyond commercial buildings and allow premise-specific requirements to move to the appropriate types of premises standards. The ANSI/TIA-569-C ballot cycle is planned to start in 2009.

Subcommittee TR-42.4, Customer-owned Outside Plant Telecommunications Infrastructure, which had been dormant for several years, was reactivated at the last TR-42 meeting of 2008 to allow elections and to evaluate future work in this committee.

The subcommittee decided to commence a revision to the ANSI/TIA-758-A, *Customer-Owned Outside Plant Telecommunications Infrastructure*, which will be the primary focus for 2009. The intent of the revision is to modify the document to follow the new release of the standard structure implemented by TR-42 and

to modify or add requirements as appropriate.

Subcommittee 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.

Subcommittee TR-42.6, Telecommunications Infrastructure and Equipment Administration, successfully completed the publication of the first addendum to TIA-606, *Administration of Equipment Rooms and Data Center Computer Rooms.* TR-42.6 also began the task of integrating the data center administration methodology into the existing commercial administration standard.

A project to revise the ANSI/TIA-606-A Standard will be undertaken in 2009, with emphasis on broadening the standard's scope to become a common standard for cabling administration.

Subcommittee TR-42.7, Telecommunications Copper Cabling Systems, began 2008 by approving the much-anticipated Category 6A balanced twisted-pair cabling standard (ANSI/TIA-568-B.2-10) for publication. Progress continued as TR-42.7 subsequently developed and balloted the massive ANSI/TIA-568-C.2, *Commercial Building Telecommunications Cabling Standard Part 2: Balanced Twisted-Pair Telecommunications Cabling and Components,* standard, which will contain all the requirements and performance criteria for category 3, 5e, 6 and 6A components (i.e., connecting hardware, patch cords and cable) and cabling (i.e., channels and permanent links), as well as laboratory verification procedures.

Publication of the TIA-568-C.2 Standard is anticipated in August 2009. The TR-42.7 Copper Cabling Systems Subcommittee continued to maintain a close relationship with IEEE 802.3 to ensure that twisted-pair cabling will provide robust support of the pending Power over Ethernet Plus (PoE Plus) application, which has required investigation of the performance and installation guidelines for the maximum current-carrying capability of twisted-pair cabling, and will result in publication of an informative overview of key performance characteristics as TSB-184, also scheduled for publication 2009. Two significant new projects started in 2008 will continue in 2009: a new standard updating field testers and field test measurement requirements (proposed TIA-1152) and an addendum examining the performance characteristic of balance if additional specifications are required. Work continues on measurement refinements for all test methods.

Subcommittee TR-42.8, Telecommunications Optical Fiber Cabling Systems, reached a milestone in 2008 with the publication of the first in the TIA-568-C Series, ANSI/TIA-568-C.3, *Optical Fiber Cabling Components Standard.* This standard includes components previously standardized, as well as "new" technologies, such as the use of multi-fiber connectors that will support parallel transmission for technologies such as 40 and 100 Gigabit Ethernet.

In 2009, the subcommittee will support new fiber technologies for TR-42 documents, such as an OM4 fiber.

Subcommittee TR-42.9, Industrial Telecommunications Infrastructure, completed the first release of the new ANSI/TIA-1005, *Telecommunications Infrastructure Standard for Industrial Premises*. This milestone is the result of 10 years of hard work by many companies and individuals.

In 2009, TR-42.9 will begin restructuring the standard to harmonize it with ANSI/TIA-568-C series standards and update the standard with appropriate information on pathways and

spaces. In addition, the subcommittee will begin to look at new technologies for industrial premises, such as plastic optical fiber.

Subcommittee TR-42.11, Optical Systems, focused on two inter-related projects in 2008: the establishment of launch condition specifications for testing attenuation of installed multimode optical fiber cabling in TSB-178, *Radiowave Propagation-Path Loss-Measurement and Validation;* and an improved measurement of launch conditions in TIA-455-203-A, *Light Source Encircled Flux Method*. Both improve the accuracy and agreement of measurements used to commission an optical fiber cabling plant.

An active project to standardize a new Polarization Mode Dispersion (PMD) measurement technique is under way and is expected to conclude in 2009.

TR-42: PREMISES TELECOMMUNICATIONS CABLING

CHAIR, TR-42: HERB CONGDON
Tyco Electronics

VICE-CHAIR, TR-42: BOB JENSEN
Fluke Networks

SUBCOMMITTEES

TR-42.1 Generic Telecommunications Cabling and Premise Cabling
CHAIR: Henry Franc, *Belden*
VICE-CHAIR: Glenn Sexton, *Northwest Information Services*

TR-42.2 Residential Telecommunications Infrastructure
CHAIR: John Pryma, *Consultant*
VICE-CHAIR: Ray Emplit, *Wiremold*

TR-42.3 Commercial Building Telecommunications Pathways and Spaces
CHAIR: Ray Emplit, *Wiremold*
VICE-CHAIR: Rich Jones, *Chatsworth Products, Inc.*

TR-42.4 Customer-owned Outside Plant Telecommunications Infrastructure
CHAIR: Julie Roy, *C^2 Consulting*
VICE-CHAIR: Jamie Silva, *Corning Cable Systems*

TR-42.5 Telecommunications Infrastructure Terms and Symbols
CHAIR: Paul Kish, *Belden*
VICE-CHAIR: Ray Emplit, *Wiremold*

TR-42.6 Telecommunications Infrastructure and Equipment Administration
CHAIR: Steve Huffaker, *JPMorgan Chase*
VICE-CHAIR: Jonathan Jew, *J&M Consultants*

TR-42.7 Telecommunications Copper Cabling Systems
CHAIR: Valerie Maguire, *The Siemon Company*
VICE-CHAIR: Sterling Vaden, *SMP Data Comm. Inc.*

TR-42.8 Telecommunications Optical Fiber Cabling Systems
CHAIR: Bob Jensen, *Fluke Networks*
VICE-CHAIR: Herb Congdon, *Tyco Electronics*

TR-42.9 Industrial Telecommunications Infrastructure
CHAIR: Bob Lounsbury, ODVA
VICE-CHAIR: Brian Shuman, *Belden*

TR-42.11 Optical Systems
CHAIR: Paul Kolesar, *CommScope*
VICE-CHAIR: Gair Brown, *U.S. Navy*

TR-42.12 Optical Fibers and Cables
CHAIR: Mike Kinard, *OFS*
VICE-CHAIR: Tom Hanson, *Corning, Inc.*

TR-42.13 Passive Optical Devices and Components
CHAIR: Greg Sandels, *Consultant*

TR-42.15 Fiber Optic Metrology
CHAIR: Dave Fisher, *Tyco Electronics*
VICE-CHAIR: Lorenz Cartellieri, *Experior Photonics, Inc.*

TR-42.16 Premises Telecommunications Bonding and Grounding
CHAIR: Mark Harger, *Harger*
VICE-CHAIR: Rich Jones, *Chatsworth Products Inc.*

Subcommittee TR-42.12, Optical Fibers and Cables, continues to work on a full slate of projects. Many of these projects are related to the fiber optic test procedures (FOTPs), fiber specifications and related documents.

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

TR-42 COMMITTEE PARTICIPANTS

3M Comm. Markets Division, ADC, Agilent Technologies, Inc., Allied Telephone and Data Corp., Anixter Inc, AT&T, Avaya, Baxter Enterprises, Beast Cabling Systems, Bechtel Telecom, Bel Stewart Connectors, Belden, Berk-Tek, Broadcom Corp., BTR Netcom Inc, Business Comm. Svcs., C2 Consulting, Chatsworth Products, Inc., CIENA Corp., Cisco Systems, Inc., CommScope Network Solutions, Connectivity Technologies, Inc., Corning Cable Systems, Corning, Inc., CSI TeleComm., Inc., Defense Supply Center, Columbus, Diamond USA, Inc., Direct Optical Research Co., Draka Comteq Optical Fibre, DYMO (RHINO), Emtelle US Inc, Experior Photonics, Erico, Inc. Caddy Fastener Div., EXFO E.O. Engineering, Inc., Experior Photonics, Inc., FiberSource Inc., Fluke Networks, Furukawa Industrial S.A., Gemalto INC, General Cable, Genesis Cable Systems, Graybar, Greenlee Textron Inc., Harger, HARTING, Inc. of North America, Henkels & McCoy, Inc., Hitachi Cable, Ltd, Homaco, Hubbell Premise Wiring, ICC, Ideal Industries, Inc., Intertek Testing Services, ITW Linx, J&M Consultants, Inc., JPMorgan Chase & Co., KITCO Fiber Optics, Leviton Network Solutions, MC Comm., Megger, Molex Inc., Motorola, Inc., National Technical Systems (NTS), NetGemini, Inc., NIES (Nexans Intel. Ent. Solutions), Nortel Networks, Northwest Information Services, Noyes Fiber Systems, ODVA Open Devicenet Vendor Association, Inc., OFS, Ortronics, Inc., Panasonic Electric Works Laboratory of America, Panduit Corp., Phoenix Contact, Photon Kinetics, Inc., PPC, Quabbin Wire & Cable Co., Inc., RIT Technologies Inc., RTKL Associates Inc., Signamax Connectivity Systems, Inc., SMP Data Comm. Inc., Soapstone Networks, Solvay Solexis, Sumitomo Electric Lightwave Corp., Superior Essex, Surtec America, Telcordia Technologies, Inc., Tellabs, Inc., The Fiber Optic Assoc., The Siemon Co., Timbercon, Inc., Tyco Electronics, UL Underwriters Laboratories Inc., US Conec LTD, U.S. Dept. of Commerce, U.S. Navy, Wiltec Technologies, Wiremold Co, Yazaki N.A., Y-Connect Oper.

One fiber specification in particular, the TIA-492AAAD specification (also called OM4), seeks to address the needs of multimode optical fibers to support 40 Gb/s and 100Gb/s data rates. Additionally, the subcommittee is working with the TR-42.2 Subcommittee on cabling for multi-tenant and multi-dwelling units (MTU/MDU). The subcommittee continues its efforts in dissemination, discussion and coordination of information flowing to and from the related International standards bodies.

Subcommittee TR-42.13, Passive Optical Devices and Components, developed documents for the evaluation and performance parameters of optical fiber connectors. These documents include, among others, the effective use and testing of adhesive materials, Hardened Fiber Optic Connectors (HFOC), and Multi-Fiber Connector (MT ferrule) geometry. Several documents were reaffirmed during 2008 as well.

In 2009, the focus will be on the development of the MDU cabling draft standard in cooperation with TR.42 subcommittees and on new technologies, such as the OM4 fiber.

Subcommittee TR-42.15, Fiber Optic Metrology, completed a significant "round robin" test battery to improve existing return loss measurements in 2008.

In 2009, the subcommittee plans to focus on equipment calibration, usage and maintenance.

Subcommittee TR-42.16, Premises Telecommunications Bonding and Grounding, (previously a working group under subcommittee TR-42.3) was established in 2008 to develop premises telecommunications bonding and grounding requirements.

The subcommittee started the revision of ANSI-J-STD- 607-A, to become TIA-607-B, *Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications,* after TR-41 relinquished control to TR-42. The subcommittee is revising the document with a significant reorganization to align the information with other TIA documents such as the 568 series. This aggressive development schedule will continue through 2009, with plans to publish a finished document in 2010.

TR-45: Mobile and Personal Communications Systems

SINCE THE MID-1980'S, ENGINEERING COMMITTEE TR-45 HAS BEEN developing voluntary performance, compatibility, interoperability and service standards for mobile and personal communications systems. TR-45 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.

Through the work of its six subcommittees, TR-45 enables a seamless, ubiquitous network. The extraordinary success of wireless throughout these years can be attributed directly to the TIA standards that are the foundation for wireless technology—two of the five TIA standards given recognition by ANSI in 2008 as significant standards that have affected and made a difference in people's lives were developed by TR-45. The two standards are the cdma2000® series and TIA-917, *Wireless Priority Services*.

In 1998, Engineering Committee TR-45 set in motion the creation of Third Generation Partnership Project 2 (3GPP2), established to facilitate the globalization of third generation (3G) standards. The TR-45 subcommittees and ad-hoc groups were extremely active in 2008 with the development of standards (most in conjunction with 3GPP2) on capabilities.

TR-45, through the Electronic Serial Number (ESN)/User Identification Module ID (UMID)/Mobility Equipment Identity (MEID) Ad-Hoc Group (EUMAG), continues to support the industry on global numbering issues related to ESN exhaust and migration to MEID and E-UIM_ID. The EUMAG also continues to work with other industry groups, such as the CDMA Development Group (CDG) to reach out and educate companies around the world on the critical need for migration to MEID and the shortage of ESNs suitable for UIMID derivation.

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

SIGNIFICANT ACCOMPLISHMENTS

In mid-1980, Engineering Committee TR-45 developed the original Analog Standard known as IS-3 (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 (namely, 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 named ANSI-136. After the IS-54 standard, 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, there are many more standards that TR-45 and its subcommittees have created 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 reveal the evolution from circuit-switched voice, circuit-switched data and packet data services to all IP-based radio access networks, capabilities and services.

A celebration highlighting the 25th anniversary of wireless service in the United States was held in Chicago in October 2008. The extraordinary success of wireless over the years can be attributed directly to TIA standards, such as those noted, which are the foundation of wireless technology. In addition, two of the five TIA standards given recognition by ANSI in 2008 as significant standards that have affected and made a difference in people's lives were devel-

oped within TR-45. The two standards are the cdma2000® series and TIA-917, *Wireless Priority Services*.

In 1998, Engineering Committee TR-45 set in motion the creation of 3GPP2, the international standards partnership program involving Association of Radio Industries and Business (ARIB), Telecommunications Technology Association (TTA), Telecommunications Technology Committee (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.

2008 OVERVIEW

The TR-45 subcommittees and ad-hoc groups were extremely active in 2008 with the development of standards (most in conjunction with 3GPP2) on capabilities such as the Ultra Mobile Broadband (UMB) suite of standards, including the Converged Access Network (CAN), numerous standards to support inter-technology interworking between HRPD (High Rate Packet Data) and E-UTRAN, cdma2000® 1X and E-UTRAN, and WiMAX and HRPD, the suite of standards for support of femtocells for 1X and HRPD, and continued work on the cdma2000® packet data standards.

The groups also continued to work on updates to the ITU-R IMT M.1457 for Releases 8 and 9. 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. Looking forward to 2009, TR-45 registered with ITU-R Working Party 5D as an Evaluation Group for international mobile telecommunications (IMT)advanced candidate RITs. The TR-45 IMT Ad-Hoc Group was reactivated to prepare for the evaluation process in 2009.

Regional regulatory activities were also a key focus of the subcommittees, with ongoing work on Lawfully Authorized Electronic Surveillance (LAES) for WLAN and cdma2000® interworking, as well as new standards development, jointly with Alliance for Telecommunications Industry Solutions (ATIS) Wireless Technologies and Systems Committee (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 electronic serial number (ESN) exhaust and migration to Mobile Equipment Identifier (MEID) and Expanded User Identification Module Identification (E-UIM_ID). TIA, the communications industry and EUMAG have also worked closely to research potential candidate ESN ranges for reclamation, reuse and for derivation as UIMID. EUMAG also continues to work with other industry groups, such as the CDMA Development Group (CDG), to reach out and educate companies around the world on the critical need for migration to MEID and the extreme shortage of ESNs suitable for UIMID derivation. For more information go to tiaonline.org/standards/resources.

The TR-45 groups, as in the past, were actively involved in the preparation of various presentations to address the High Interest Subjects discussed during the Global Standards Collaboration (GSC) 13 meeting held in July 2008.

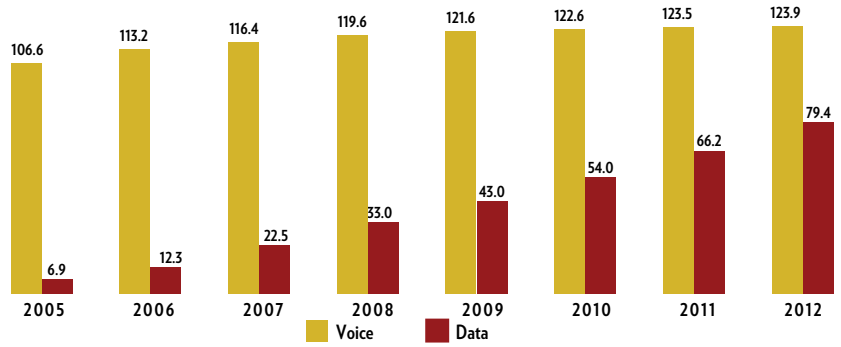
Going forward, 2009 looks to be another busy year, with work on enhancements to cdma2000® 1x, HRPD and femtocells. TR-45 will also continue working on support of regulatory capabilities for LAES and joint work with the ATIS WTSC on CMAS, as well as on a new Revision C of the Joint Emergency Services Standard, J-STD-036 to address E911 support for femtocells.

2008 ACTIVITIES

Subcommittee TR-45.2, Wireless Intersystem Technology, focused on the development of network interface standards and service definitions to support interoperability and intersystem operations for interfaces between those network elements that comprise the wireless intersystem infrastructure. Subcommittee TR-45.2 worked closely with 3GPP2 TSG-X and 3GPP2 TSG-S to transpose specifications developed in conjunction with 3GPP2 into TIA standards.

During 2008, Subcommittee TR-45.2 approved more than 55 standards for publication. Key among these standards were 12 revisions of the multi-part TIA-873-B *Multi-media*

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



Source: *TIA's 2009 ICT Market Review and Forecast*

Domain (MMD) series of standards; nearly a dozen legacy TIA-41 *Mobile Application Part (MAP)* series of standards associated with voice feature scenarios, signaling protocols, call processing, intersystem operations and more; and five revisions of the multi-part TIA-1032, *Presence Service: Architecture and Functional Description*.

In addition, Subcommittee TR-45.2 approved the following standards for publication:

- TIA-881-1, *MAP Location Services*
- TIA-1133, *All-IP Network Emergency Call Support Stage 1 Requirements*
- TIA-1111, *All-IP Emergency Call Support*
- TIA-1126, *VoIP Supplementary Services Feature Descriptions, Stage 1 Requirements*
- TIA-1136, *MMD Supplementary Services*
- TIA-1147, *IMS Centralized Services Stage 1 Requirements*

Looking forward to 2009, Subcommittee TR-45.2 has been merged with Subcommittee TR-45.6, to form the new Subcommittee TR-45.8, which will play a significant role in the development of core network standards in conjunction with 3GPP2 and completion of the joint development standards work with ATIS to support CMAS.

Subcommittee 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 2008, 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 published the following ANSI TIA/EIA-136-G standards to meet the October 2008 deadline to ITU-R for M.1457-8.

- SP-3-4027-000 RV7, to be published as ANSI TIA/EIA 136-000 Rev G *TDMA Third Generation Wireless List of Parts*
- SP-3-4027-123 RV7, to be published as ANSI TIA/EIA 136-123 Rev G *TDMA Third Generation Wireless Digital Control Channel Layer 3*
- SP-3-4027-370 RV3, to be published as ANSI TIA/EIA 136-370 Rev C *TDMA Third Generation Wireless Enhanced General Packet-Data Service (EGPRS-136)*
- SP-3-4027-376 RV3, to be published as ANSI TIA/EIA 136-376 Rev C *TDMA Third Generation Wireless Enhanced General Packet-Data Service (EGPRS-136) Mobility Management (MM)*
- SP-3-4027-377 RV3, to be published as ANSI TIA/EIA 136-377 Rev C *TDMA Third Generation Wireless EGPRS-136 Gs Interface Specifications*
- S-P3-4027-440 RV3, to be published as ANSI TIA/EIA 136-440 Rev C *TDMA Third Generation Wireless Adaptive Multi Rate (AMR) Codec*

Looking forward to 2009, 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.1457-9.

Subcommittee 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 the RAN.

In 2008, Subcommittee TR-45.4 approved several standards for publication including:

- TIA-878-A-2, *High Rate Packet Data (HRPD) Interoperability Specification (IOS) Radio Access Network Interfaces with Session Control in the Access Network*
- TIA-1878-A-2, *High Rate Packet Data (HRPD) Interoperability Specification (IOS) Radio Access Network Interfaces with Session Control in the Packet Control Function*
- TIA-1134-1, *Interoperability Specification (IOS) for Ultra Mobile Broadband (UMB) Radio Access Network Interface*
- TIA-1135, *Inter-Technology Handoff for Ultra Mobile Broadband (UMB) Radio Access Network Interfaces*
- TIA-2006-A-1, *Broadcast Multicast (BCMCS) Interoperability Specification (IOS)*

Looking forward to 2009, Subcommittee TR-45.4 expects to complete standards on HRPD IOS-B addendum 1, HRPD IOS-C addendum 1, E-UTRAN-eHRPD IOS, WiMAX-HRPD IOS, Femto IOS, MSC Pool and more.

Subcommittee TR-45.5, Spread Spectrum Digital Technology, continues to be the industry leader in the publication of standards for Third Generation (3G) and beyond cdma2000®. TR-45.5, in conjunction with 3GPP2 TSG-C, continues working on the next revision of the cdma2000® Standards for Spread Spectrum Systems series of standards. Numerous cdma2000® related standards were published (or approved for publication) in 2008. Among the published standards are:

- TIA-1150, *Highly Detectable Pilot Specification for the cdma2000® High Rate Packet Data Air Interface*
- TIA-1157, *Signaling Conformance Test Specification for Inter-working of cdma2000® 1x and High Rate Packet Data Systems*
- TIA-1121.002-1, *MAC Layer for Ultra Mobile Broadband (UMB) Air Interface Specification*
- TIA-820-C-1[E], *Removable User Identity Module for Spread Spectrum Systems*
- TIA-683-D-1[E], *Mobile Stations in Spread Spectrum Systems*
- TIA-1121.012, *Medium Access*

Control for Ultra Mobile Broadband (UMB) TDD Air Interface Specification

- TIA-1121.011, *Physical Layer for Ultra Mobile Broadband (UMB) TDD Air Interface Specification*
- TIA-1080-1[E], *cdma2000® Application on UICC for Spread Spectrum Systems*
- TIA-158-1[E], *Over-the-Air Service Provisioning for MEID-Equipped Mobile Stations in Spread Spectrum Systems*
- TIA-1030-C, *Band Class Specification for cdma2000® Spread Spectrum Systems*
- TIA-866-A-1, *Recommended Minimum Performance Standards for cdma2000® High Rate Packet Data Access Terminal*
- TIA-864-B, *Recommended Minimum Performance Standards for cdma2000® High Rate Packet Data Access Network*
- TIA-890-B, *Test Application Specification for cdma2000® High Rate Packet Data Access Network*
- TIA-1084-A, *Signaling Test Specification for Mobile Station Equipment Identifier (MEID) Support for cdma2000® Systems*
- TIA-1122, *VoIP Codecs and Protocols*
- TIA-1043-A, *Over-the-Air Interoperability Specification for* cdma2000® *Air Interface*
- TIA-718-B [SF], *Software Distribution for Enhanced Variable Rate Codec (EVRC), Speech Service Options 3 and 68 for Wideband Spread Spectrum Digital Systems, Minimum Performance Specification (MPS) Proposed Publication Version*
- TIA-718-C [SF], *Software Distribution for Enhanced Variable Rate Codec (EVRC), Speech Service Options 3, 68, and 70 for Wideband Spread Spectrum Digital Systems, Minimum Performance Specification (MPS)*

During 2008, TR-45.5 provided updates to the ITU-R WP5D Global Core Specifications (GCS) and Roadmap, WRC-07, M.1580 and M.1581, as well as Recommendation M.1457-9 relative to CDMA-MC. Furthermore, the subcommittee actively participated in the joint development of the CMAS standards with ATIS.

Subcommittee TR-45.6, Adjunct Wireless Packet Data Technology, was chartered with developing performance, compatibility and interoperability standards for equipment that supports wireless packet data services, which may be deployed as an integral part of a cdma2000® system. In addition, TR-45.6 was charged with developing standards relative to cdma2000® packet data network technologies and LAES.

In August 2008, Subcommittee TR-45.6 merged with Subcommittee TR-45.2 to form the new Subcommittee TR-45.8. The 2008 activities of TR-45.6 are summarized with the activities of Subcommittee TR-45.8 below.

Subcommittee TR-45.8, Core Networks, was formed by a merger of TR-45.2 and TR-45.6 in August 2008. TR-45.8 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 and multimedia core network standards. These standards pertain to service definition and network interface standards for support of 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. Subcommittee TR-45.8 continues to work closely with 3GPP2 TSG-X and 3GPP2 TSG-S to transpose specifications developed in 3GPP2 into TIA standards.

Since its creation in August 2008, Subcommittee TR-45.8 has approved seven standards for publication. Key among these standards were two revisions of the *Converged Access Network (CAN)* standards, a revision of *Voice Call Continuity, 1x Support for PMIP* and an addendum to the *cdma2000® Packet Data Network Standard*. In addition, the *System Requirements for MSC Pool* was published, as well as a TSB on *Common IMS Impact to 3GPP2*. Other active projects include *LTE-eHRPD Interworking, WiMAX-HRPD Interworking* and new capabilities for the *cdma2000® Packet Data Standard*.

Looking forward to 2009, Subcommittee TR-45.8 will continue to play a significant role in the joint standards development work with ATIS to support CMAS. A new joint TIA/ATIS effort has been initiated to

add support for E-911 for femtocells, with a kick-off meeting held in February. The Lawful Intercept Group (LIG) ad hoc will continue its efforts to provide lawful intercept support for WLAN, as well as to perform a study of the cdma2000® aspects of the J-STD-025-B document impacted by the Department of Justice deficiency petition pending at the FCC.

To find out more about participating in TR-45, please contact Peter Bogard: pbogard@tiaonline.org, +1.703.907.7961.

The TR-45 Ad Hoc Authentication Group (AHAG) continued to develop drafts of procedures and conduct reviews of requirements related to any number of security and authentication related topics and issues. During 2008, the AHAG recommended that TR-45 approve the following standards for publication:

- TIA-946-A, *Enhanced Cryptographic Algorithms*
- TIA-1097-A, *Security Mechanisms Using GBA*
- TIA-1098-A, *Generic Bootstrapping Architecture (GBA) Framework*
- TIA-1141, *CAVE-Based IMS Security*

During 2009, the AHAG anticipates recommending that TR-45 approve the Femto Security Framework as TIA-1169 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 para-

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TR-45: MOBILE AND PERSONAL COMMUNICATIONS SYSTEMS

CHAIR, TR-45: CHERYL J. BLUM
Alcatel-Lucent

VICE-CHAIR, TR-45: GERRY FLYNN
Verizon Wireless

SECRETARY, TR-45: JANE BROWNLEY
Alcatel-Lucent

SUBCOMMITTEES AND AD-HOC GROUPS

TR-45.2 Wireless Intersystem Technology
CHAIR: Lewis Milton, Motorola, Inc.

TR-45-3 Time Division Digital Technology
CHAIR: Peter Musgrove, AT&T

TR-45.4 Radio to Switching Technology
CHAIR: George Turnipseed, Sprint Nextel

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

TR-45.6 Adjunct Wireless Packet Data Technology
CHAIR: Brent Hirschman, Sprint Nextel

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 Group on ESN/UIM/MEID
CHAIR: Gary Pellegrino, CommFlow Resources Inc.

TR-45 Ad-Hoc on Electronic Media Documentation (AHEM)
CHAIR: Peter Nurse, Alcatel-Lucent

TR-45 COMPANY PARTICIPANTS

Aeroflex, Agilent Technologies, Inc., AirCell, LLC, Airvana, Inc., Alcatel-Lucent, ALLTEL Comm., Inc., Apple, AT&T, Bell Canada, Bridgewater Systems Inc., Camiant, CDMA Development Group, Cingular Wireless, Cisco Systems, Inc., CML Microcircuits (USA) Inc., CommFlow Resources Inc., CSI TeleComm., Inc., DoCoMo Comm. Lab USA, Inc., Dolby Laboratories Inc., Ericsson, Inc., ETI Connect, FBI, FTR&D LLC, Fujitsu Network Comm., Inc., Gemalto Inc., Hitachi Telecom (USA) Inc., Huawei Technologies USA, Hughes Network Systems, LLC, Intel Corp., Intellon, Intrado, IP Fabrics, Kyocera Sanyo Telecom, Inc., Kyocera Telecomm. Research Corp., LG InfoComm U.S.A., Inc., Lockheed Martin Corp., Motorola, Inc., Movius Interactive Corp., National Comm. System, NeuStar Inc., Nokia, Inc., Nokia Siemens Networks, Nortel Networks, Panasonic Computer Solutions Co., Qualcomm, Inc., Research In Motion Corp., Rogers Wireless, Rohde & Schwarz, Inc., RTKL Associates Inc., Samsung Electronics, Samsung Telecom America, Sharp Laboratories of America, Sierra Wireless America, Inc., Sigma Delta Comm., Inc., Space Data Corp., Spirent Comm., Sprint Nextel, SS8 Networks, Inc., Starent Networks Corp., Tatara Systems, Telcordia Technologies, Inc., TeleComm. Systems, Inc., Texas Instruments, Inc., US Cellular, UTStarcom, Inc., Verizon Wireless, VIA Telecom, ZTE USA, Inc.

Below is a listing of global organizations that TIA works with to develop standards worldwide:

ACTA (The Administrative Council for Terminal Attachment)

The Administrative Council for Terminal Attachments is an open organization established to: (1) adopt technical criteria and to act as the clearing-house, publishing technical criteria for terminal equipment developed by ANSI-accredited standards development organizations; and (2) establish and maintain a registration database of equipment approved as compliant with the technical criteria.

APCO (The Association of Public-Safety Communications Officials International)

APCO International is a member driven association of communications professionals that provides leadership; influences public safety communications decisions of government and industry; promotes professional development; and, fosters the development and use of technology for the benefit of the public.

ARIB (Association of Radio Industries and Business-Japan)

ARIB's goal is to advance rapidly the use of radio technology for the benefit of society. This is done by integrating knowledge and experience in various fields of radio use such as broadcasting and telecommunications, research and development in radio technology, and serving as a standards development organization for radio technology.

ATIS (Alliance for Telecommunications Industry Solutions)

ATIS develops standards and solutions addressing a wide range of industry issues in a manner that allocates and coordinates industry resources and produces the greatest return for communications companies. ATIS creates solutions that support the rollout of new products and services into the information, entertainment and communications marketplace.

- **ATIS ESIF** (Emergency Services Interconnection Forum)
- **ATIS NIPP** (Network Interface, Power, and Protection Committee)
- **ATIS PTSC** (Packet Technologies and System Committees)

BICSI

BICSI is a professional association supporting the information transport systems (ITS) industry. ITS covers the spectrum of voice, data, electronic safety & security, and audio & video technologies. BICSI provides information, education and knowledge assessment for individuals and companies in the ITS industry.

CDG (CDMA Development Group)

CDG is an international consortium of companies who have joined together to lead the adoption and evolution of 3G CDMA wireless systems around the world.

CSA (The Canadian Standard Association)

The CSA is a not-for-profit membership-based association serving business, industry, government and consumers in Canada and the global marketplace. As a solutions-oriented organization, CSA works in Canada and around the world to develop standards that address real needs, such as enhancing public health and safety.

CCSA (China Communications Standards Association)

CCSA is a non-profit organization established by enterprises and institutes in China for carrying out standardization activities in the field of Information and Communications Technology (ICT) across China. CCSA is committed to making contribution to the development of ICT industry under the guidance of the authorities, i.e. the Ministry of Information Industry, and other authorities in China by establishing an enterprise-based and market-oriented working system that incorporates the industry, universities and R&D institutes and conducting communications standardization activities following the principle of "Openness, Fairness, Justness and Consensus."

DVB (Digital Video Broadcasting Project)

The DVB Project is an industry-led consortium of broadcasters, manufacturers, network operators, software developers, regulatory bodies and others committed to designing open interoperable standards for the global delivery of digital media services.

ECCB (Electronic Components Certification Board)

ECCB mission is to provide national and international value-added certified recognition for organizations involved with electronic components and related products and processes through the International Electrotechnical Commission Quality Assessment System.

ETSI (The European Telecommunications Standards Institute)

ETSI produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and internet technologies.

- **ETSI STQ** (Speech, Transmission Planning, and Quality of Service)

Flo Forum

Forum members are network operators, device and equipment manufacturers,

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Turn the page for a pullout map of the influence and impact of TIA's Standards program in the world of ICT development.

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 (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 Secretariat and Partner (3GPP2)

Healthcare

Healthcare Information Communications Technology (TR-49)

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

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 Advisory Council on 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

Intelligent Transport Systems

- Vehicular Telematics (TR-48)
- ISO Intelligent Transport Systems US Technical Advisory Group (ISO TC204USTAG)
- Intelligent Transport Systems Secretariat (ISO TC204)

ISO International Organization for Standardization

tiaonline.org

TIA MANAGED Committees

OTHER ORGANIZATIONS

CONTINUED FROM PAGE 31

and content providers—all sharing the common objective of developing FLO-based networks, products and services capable of delivering advanced mobile multicast multimedia services.

ICEA (Insulated Cable Engineers Association)

ICEA is a professional non-profit organization dedicated to developing cable standards for the electric power, control, and telecommunications industries. Since 1925, the objective has been to ensure safe, economical, and efficient cable systems utilizing proven state-of-the-art materials and concepts.

IEC (International Electrotechnical Commision)

The IEC is the leading global organization that prepares and publishes international standards for all electrical, electronic and related technologies. IEC SC48B (Mechanical Structures for Electronic Equipment) prepares standards for electric connectors, component devices and value added devices with definite allocation of interface and usage.

USNC IEC (United States National Committee)

USNC of IEC serves as the focal point for U.S. parties who are interested in the development, promulgation and use of globally-relevant standards for the electotechnical industry.

IEEE (Institute of Electrical and Electronics Engineers)

A non-profit organization, is the world's leading professional association for the advancement of technology. The IEEE is a leading authority on areas ranging from aerospace systems, computers and telecommunications to biomedical engineering, electric power and consumer electronics among others.

- **IEEE STIT** (Subcommittee on Telephone Instrument Testing)

INCITIS (International Committee for Information Technology Standards)

INCITS is the forum of choice for information technology developers, producers and users for the creation and maintenance of formal de jure IT standards.

ITU-T (ITU-Telecommunication Standardization Sector)

ITU's role as creator of the world's most universally-recognized infocommunications standards dates back as far as the organization itself. Since its inception in 1865, the Union has been brokering industry consensus on the technologies and services that form the backbone of the world's largest, most interconnected man-made system.

ITU-R (ITU – Radio-communication Sector)

The ITU-R plays a vital role in the management of the radio-frequency spectrum and satellite orbits, finite natural resources which are increasingly in demand from a large number of services such as fixed, mobile, broadcasting, amateur, space research, meteorology, global positioning systems, environmental monitoring and, last but not least, those communication services that ensure safety of life on land, at sea and in the skies.

- **ITU-R SG 8** – Mobile, radio determination, amateur and related satellite services

MEF (Metro Ethernet Forum)

MEF's mission is to accelerate the worldwide adoption of Carrier-class Ethernet networks and services. MEF is a global industry alliance comprised of telecommunications service providers, cable operators, MSOs, network equipment, test vendors, labs and software manufacturers, semiconductors vendors and testing organizations. Its purpose is to develop technical specifications and implementation agreements to promote interoperability and deployment of Carrier Ethernet worldwide.

MESA (Mobility for Emergency and Safety Applications)

The purpose of MESA is to collect user requirements and elaborate joint specifications that define applications for mobile broadband technology to be deployed in support of law enforcement, international crime and terror investigations, intelligence, emergency and medical services, fire fighting, civil and homeland defense, and disaster response.

SES (Standards Engineering Society)

SES is a non-profit, technical association dedicated to furthering the knowledge and use of standards and standardization.

TTA (Telecommunications Technology Association – Korea)

The purpose of TTA is to contribute to the advancement of technology and the promotion of information and telecommunications services and industry as well as the development of national economy, by effectively establishing and providing technical standards that reflect the latest domestic and international technological advances, needed for the planning, design and operation of global end-to-end telecommunications and related information services.

TTC (Telecommunication Technology Committee – Japan)

The purpose of this committee is to contribute to standardization in the field of telecommunications by establishing protocols and standards for telecommunications networks and terminal equipment and to disseminate those standards.

See TIA's Standards and Technology Annual report at tiaonline.org for information on all of the standards programs supported by TIA.

Pull out map on prior pages shows the influence and impact of TIA's Standards program in the world of ICT development.

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mount concern to the industry including the migration to MEID and E-UIM-ID, MEID global hexadecimal administration and guidelines, UIM ID manufacturer codes, UIM administration, ESN manufacturer codes, ESN reclamation and re-use, and ESN administration.

One of the primary ongoing issues addressed by the EUMAG during 2008, and continuing in 2009, is research of (with the support of industry participants and the ESN/UIMID Administrators) ESN assignments for UIMIDs derived from ESNs. The ESN Administrator and EUMAG continue to research candidate ranges for the voluntary return of ESN Manufacturer Codes from manufacturers. Thanks to the conservation efforts of the industry, EUMAG and the TIA ESN Administrator, the expected timeframe for "virgin" ESN (i.e., those code blocks that have never been assigned to a manufacturer) exhaust was extended through 2008. EUMAG facilitated publication of the updated *ESN Manufacturers Code Assignment Guidelines and Procedures* which promote the use of particular identified codes for ESN assignment will be supported for only 17 months from the date of the Version 2.0 ESN Guidelines approval. Specifically, December 31, 2009, is the last date for receipt of an ESN MFR Code block request (see *ESN Guidelines:* Section 5.13).

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 D and other topics. Additionally, the work of EUMAG includes maintaining the editorship of the *TIA ESN Assignment Guidelines & Procedures,* the TIA MEID G*lobal Hexadecimal Administrator (GHA) Assignment Guidelines and Procedures* and the *3GPP2 User Identification Module ID Manufacturer's Code Assignment Guidelines and Procedures.*

As a leader in the industry, the EUMAG continues to educate the industry through outreach awareness programs, working closely with the CDMA Development Group (CDG) in the management of the ESN exhaust timeline and transition to MEID. TIA has posted ESN and MEID resource documents developed by EUMAG and related information on the TIA Web site. A list of answers to Frequently Asked Questions (FAQs) and the milestone timelines for ESN migration to MEID, as well as related links, are available on the Web site. Moreover, a TIA ESN white paper developed by EUMAG under the auspices of the TIA Wireless Communication Division (WCD) as recommended by TR-45 to raise awareness on ESN exhaust and the need to continue expedited migration to MEIDs can also be found online. MEID assignments have been ongoing since the initial assignments were made in January 2006, and MEID system implementations continue industry-wide.

The 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. Electronic methods the AHEM continued to champion during 2008 include a Web-based calendar and electronic sign-in at meetings.

TR-47: Terrestrial Mobile Multimedia Multicast (TM3)

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

Among the many accomplishments of TR-47, the committee and its two subcommittees revised their scopes in 2008 to include non-terrestrial support. A number of standards were developed and approved during 2008 by the TR-47 subcommittees, including several dealing with forward link only interface.

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 ETSI, 3GPP, DVB Project, Mobile DTV Alliance and the FLO Forum.

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

SIGNIFICANT ACCOMPLISHMENTS

TR-47 focuses on Terrestrial Mobile Multimedia Multicast technologies. Within a year of its initiation, TR-47 had published two technology standards to address Terrestrial Mobile Multimedia Multicast based on Digital Video Broadcasting and a Forward Link Only Air Interface Specification for Terrestrial Mobile Multimedia Multicast systems. These standards 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 on the move. Additionally, the committee and its two subcommittees revised their scopes in 2008 to include non-terrestrial support of expanded work to support the industry needs. The TR-47 subcommittees developed and approved a number of standards during 2008. A summary of those standards is provided in the subcommittee sections below.

2008 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 work 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 ETSI, 3GPP, DVB Project, Mobile DTV Alliance and the FLO Forum.

2008 ACTIVITIES

Subcommittee TR-47.1, TM³ Based on Forward Link Only Air Interface, 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 RF channel and supports different 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 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 the following five specifications in 2008:

- TIA-1130, *Forward Link Only Media Adaptation Layer Specification*
- TIA-1132, *Minimum Performance Specification for Terrestrial Mobile Multimedia Multicast Forward Link Only Repeaters*
- TIA-1099 Addendum, *Forward Link Only Air Interface Specification*
- TIA-1099 Rev. A, *Forward Link Only Air Interface Specification*
- TIA- 1146, *Forward Link Only Conditional Access (Open CA) Specification*

The subcommittee members anticipate additional new and significant projects for 2009.

Subcommittee 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 Digital Video Broadcasting for Handheld 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 digital video broadcasting for handheld 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.

A number of liaisons continue with other organizations. A new project was started to support satellite hybrid systems consistent with standardization work in ETSI and the DVB Project. The project is TIA-1168, *Terrestrial Mobile Multimedia Multicast Based on Digital Video Broadcasting for Handheld Devices Using Satellite, Terrestrial or Hybrid Networks Operating Below 3 GHz.*

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

TR-47: TERRESTRIAL & NON-TERRESTRIAL MOBILE MULTIMEDIA MULTICAST

CHAIR, TR-47: JERRY UPTON
Jerry Upton Consulting

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

SUBCOMMITTEES

TR-47.1 TM³ Based on Forward Link Only Technology
CHAIR: Carl Stevenson, *WK3C Wireless LLC*

TR-47.2 TM³ Based on DVB-H Technology
CHAIR: R. Thomas Derryberry, *Nokia*

TR-47 COMMITTEE PARTICIPANTS

Airvana, Inc., Alcatel-Lucent, Corning Inc., DoCoMo Comm. Lab USA, Dolby Laboratories Inc., Electronics Research, Inc., Ericsson, Inc., FLO Forum, FTR&D LLC, Harris Corp., Intel Corp., Intellon, J. Upton Consulting, Kyocera Sanyo Telecom, Inc., Kyocera Telecomm. Research Corp., LG InfoComm U.S.A., Inc., Motorola, Inc., National Comm. System, Newport Media Inc., Nokia Inc., Nokia Siemens Networks, Nortel Networks, Panduit Corp., Qualcomm Inc., Rogers Wireless, Rohde & Schwarz, Inc., Samsung Telecom. America, Sharp Laboratories of America, SkyTerra Comm., Space Data Corp., Sprint Nextel, Texas Instruments, Inc., Verizon Wireless, 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. These standards are intended to be employed in support of vehicular telematics.

Telematics Service Providers (TSPs) have the capability 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 predict more accurately what rescue and medical equipment will be needed at the scene.

TIA-48 recognizes that the delivery of consumer (e.g., crash) and commercial (e.g., trucking and specifically hazmat) telematics data to 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 lives of victims and responders, help alleviate congestion and reduce the number of ensuing additional incidents. The key is data interoperability among all the organizations affected by and responding to the emergency, not just those in transportation.

In light of this, TIA has assigned Project Number PN-3-0333 and Publication ID TIA-1153 for *Emergency Information Delivery Protocol* proposed by David Aylward, a founder and Director of the COMCARE Alliance, and Tom Kurihara, Chair of IEEE P1609 Dedicated Short Range Communication (DSRC) Working Group. The project goal is to enable sharing of incident data and information among TSPs and appropriate organizations.

TSPs have the capability 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 appropriate organizations.

Although COMCARE 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 Web site could be developed to display a wide variety of incident data. The project scope is twofold:

Conduct research of 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, and SAE Location Referencing Message Specification (LRMS) and Message Set Dictionary, and Organization for the Advancement of Structural InformationStandards (OASIS) Common Alerting Protocol (CAP) and Emergency Data Exchange Language (EDXL).

Determine feasibility and describe the architecture, protocol, core services middleware, interfaces, registration and policies for a common middleware protocol for emergency information exchange.

2008 OVERVIEW

TSPs have the capability 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.

The delivery of consumer (e.g., crash) and commercial (e.g., trucking and specifically hazmat) telematics data to 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 lives of victims and responders, help alleviate congestion and reduce the number of ensuing additional incidents. The key is data interoperability all the organizations affected by and responding to the emergency, not just those in transportation.

Information from TSPs and commercial fleet tracking companies is generally not available to the emergency response community, despite their 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 immediate alerting of the proper agencies 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 several years, COMCARE and its members have designed an approach and architecture that would radically improve this information flow, linking automotive and trucking entities with emergency response and traffic agencies. Most of the 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 (weather, terrorist, Amber, traffic alerts, etc.)? The committee believes it can serve both needs and is economically and architecturally sound, but the issue has not been subjected to intensive discussion 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 like the above. However, almost all do have Internet connections, or could get

them easily. An interim step to allow rapid sharing of such data inexpensively is to provide the data using the messaging standards noted above to an "emergency incident Web site" and display it on an electronic map. This would be available to all emergency response agencies. Agency subscribers would be able to see only their area and adjacent jurisdictions. Over time, registration for the Web site could become registration for the core services described above or governed by them.

2008 ACTIVITIES

TR-48 held monthly and ad hoc teleconferences and issued 11 meeting reports in 2008 with the following highlights:

Dave Kraft, Vice-Chair TR-48, 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 the 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).

On April 10 and June 10, 2008, Axel Moer-

ing, BMW Senior Engineering Project Manager for the Next Generation Telematics Protocol (NGTP), provided an overview of NGTP. This protocol offers a flexible solution with an open interface between the telematics delivery chain components Telematics Communications Units (TCUs), TSPs, call centers, content providers and a technology-neutral "dispatcher" to communicate between the TCUs and TSPs. NGTP is compatible with existing protocols such as Global Telematics Protocol (GTP) that consolidated Application Communication Protocol (ACP) and Global Automotive Telematics Standard (GATS).

TR-48's project PN-3-0333 scope was included in a presentation on TIA Intelligent Transportation Systems during the Global Standards Collaboration meeting GSC-13 hosted by ATIS in Boston, July 14-17, 2008.

On September 4, 2008, Scott McCormick, President of CVTA (the Connected Vehicle Trade Association), gave a presentation about the CVTA .car Committee and Working Groups for safe access to Internet content within vehicles. Rob Schill, Executive Director of VTIC (the Vehicle Traffic Information Coalition), gave a presentation about the VTIC activities and the needs, benefits and sources for real-time traffic information.

In addition, TR-48 tracks the development of other vehicular telematics standards such as ISO/TC204 WG 17, *Nomadic and Portable Devices for ITS Services,* the Vehicle Gateway Platforms (VGP) Ad Hoc Group of the ITU-T Study Group 16 (SG 16), and the North American Traffic Working Group (NATWG) of ITS America.

To find out more about participating in TR-48, please contact Chenoa Ellison: cellison@tiaonline.org, +1.703.907.7486.

TR-48: VEHICULAR TELEMATICS

CHAIR, TR-48: KEVIN LU
Telcordia

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

TR-48 COMMITTEE PARTICIPANTS

Alcatel-Lucent, COMCARE, Hughes Network Systems, LLC, Intertek Testing Services, OnStar Corp., Qualcomm Inc., Rogers Wireless, Sigma Delta Comm., Inc., Telcordia Technologies, Inc., Ygomi LLC

TR-49: Healthcare ICT

SINCE 2007, ENGINEERING COMMITTEE TR-49 HAS BEEN RESPONSIBLE FOR the development and maintenance of voluntary standards for healthcare ICT applications that involve medical devices, network infrastructure, applications and operations support.

In 2008, the committee clarified and selected work areas and needs for healthcare-related standards not currently addressed by standards bodies and continued to work on growing its membership.

Specifically, the committee proposed that one of its work areas be standardization of services and architectures to support Health Information Technology (HIT) on a future service-enabled network (SEN) for healthcare.

...proposed that one of its work areas be standardization of services and architectures to support health information technology (HIT) on a future service-enabled network (SEN) for healthcare.

2008 OVERVIEW

The committee goals for this year were to clarify and select work areas and needs for healthcare-related standards not currently addressed by standards bodies and to grow its membership.

2008 ACTIVITIES

On January 14, 2008, at the election meeting for the committee, the committee elected Shoshana Loeb, Telcordia, as its Chair. The committee took actions to investigate the following four areas in healthcare:

- Device systems
- Network infrastructure
- Applications/services
- Operations support

The committee met several times during the year, with increased participation. The meetings produced the following results:

Evolving frameworks for the delivery of communication and multimedia services over Internet protocol (IP) networks offer new opportunities in healthcare. These frameworks provide the ability to access and provision services seamlessly over wireless and wireline devices, make Internet and Web technologies available nearly anywhere, and support cutting-edge services combining multimedia, geolocation and context awareness. These frameworks can provide a powerful new way to deliver HIT services, especially for those requiring mobility. The committee proposed that one of its work areas be standardization of services and architectures to support HIT on a future service-enabled network (SEN) for healthcare.

The committee, in order to understand and define HIT applications that might benefit from a SEN for healthcare, sought external sources of HIT standards. The Healthcare Information Technology Standards Panel (HITSP) is a federally-funded panel with the objective of harmonizing standards in the healthcare industry to enable and advance interoperability of HIT applications. Their major work products are use cases that define the business and functional requirements for high-impact HIT applications. One of the committee's accomplishments during the year was to begin a process to define how

To find out more about participating in TR-49, please contact Chenoa Ellison: cellison@tiaonline.org, +1.703.907.7486.

TR-49: HEALTHCARE ICT

CHAIR, TR-49: SHOSHANA LOEB
Telcordia Technologies

TR-49 COMMITTEE PARTICIPANTS

Alcatel-Lucent, AT&T, Belden Networks Div., CommScope Network Solutions, Harris Corp., Motorola Inc., Panasonic Computer Solutions Co., Panduit Corp., Qualcomm Inc., Sigma Delta Comm. Inc., Telcordia Technologies Inc., Tyco Electronics

these HITSP use cases could be supported using a future SEN for healthcare.

The committee examined constructs and work artifacts produced by other standards bodies to discuss and propose the format for the standardization work products it will produce.

Through a series of invited talks and market research, the committee began a process to understand the scope and utility of the standardization process it will initiate.

The committee is supporting the creation of a new forum for discussing market needs for the HIT market.

TIA Global Involvement

In addition to facilitating the formation 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 graphical illustration on page 32 depicts the Worldwide Reach of TIA Standards and our commitment to working with other organizations globally in the development of standards for the entire information, communications and technology (ICT) industry.

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

JTC 1/SC 25 FOCUSES ON THE STANDARDIZATION OF MICROPROCESSOR systems and of interfaces, protocols, architectures and associated interconnecting media for information technology equipment and networks, generally for commercial and residential environments, to support embedded and distributed computing environments, storage systems and other input/output components. This scope includes requirements for components but excludes component specifications. It also excludes the development of standards for public networks and interfaces to public networks.

2008 OVERVIEW

Subcommittee 25 (SC 25) operates under Joint Technical Committee 1 (JTC 1), the committee responsible for information technology standards under two international standards bodies: International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC).

At the end of the report period, there were 194 active projects assigned to JTC 1/SC 25. Of these, 118 are published IEC or ISO/IEC Standards, Technical Reports, Amendments and Corrigenda. Thirteen documents comprised of 1,347 pages were published from September 2007 to September 2008. Of the remaining 66 projects, 13 are at Final Draft International Standard (FDIS) or Final Draft Amendment (FDAM) stage and beyond (for details, see SC 25 N 1588). One of these projects is a standard with 74 parts and about 2,700 pages due for publication. For another eight projects, New Work Identification Proposals (NWIPs) have been announced. A complete listing of the projects including published standards and technical reports from JTC 1/SC 25 is included in the Program of Work as distributed by the SC 25 Secretariat.

The last meeting of JTC 1/SC 25 was held October 24, 2008, in Lyon, France. Twenty-seven countries were represented. Currently there are 29 Participating ("P") members and 14 Observer ("O") members.

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 System
- 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, the mode of operation and liaisons differ considerably among the three working groups of SC 25.

Liaisons with other standards committees are maintained for effective contribution and participation:

- ISO/IEC JTC 1/SC 6
- ISO/IEC JTC 1/SC 17/WG 9
- ISO/IEC JTC 1/SC 22
- ISO/IEC JTC 1/SC 27
- ISO/IEC JTC 1/SC 36
- IEC TC 46
- IEC TC 48
- IEC SC 65C
- IEC TC 77B/WG 5
- IEC SC 79
- IEC TC 86
- IEC SC 86B
- IEC SC 86C
- IEC TC 100
- IEC ACOS/WG 1
- IEC CISPR CIS/I
- INCITS R1.1
- ITU-T SG 9

- CENELEC TC 205/WG 3
- CENELEC TC 205/WG 5
- CENELEC TC 205/WG 16
- CENELEC TC 215
- ETSI
- ECMA
- Realtime Systems
- DSL Forum
- GridWise Architecture Council
- UPnP Forum™

2008 ACTIVITIES

ISO/IECJTC 1/SC 25/WG 1 – Home Electronic System 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 and utility cost-containment), lighting and window coverings, audio/video entertainment, telecommunications, life safety and health (including telemedicine), security, home computer networks and appliances. Home networks may 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 encompasses access to external services via residential gateways. A residential gateway links the home network, which is based on local area network technology, with an external network, based on wide area network technology such as the Internet. The gateway also provides data security, privacy and safety for devices on the home network.

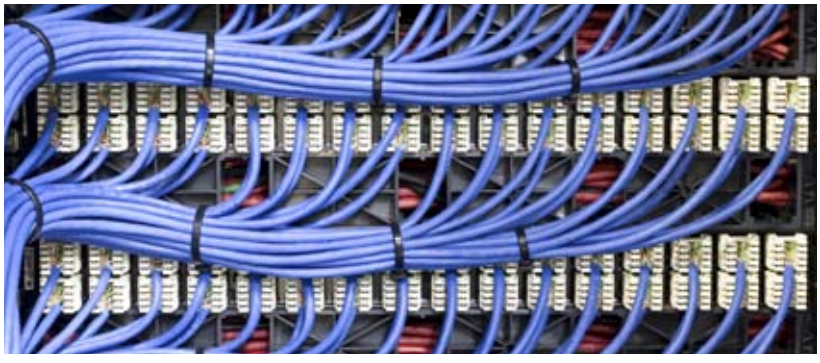
In addition to the gateway project, WG 1 is writing standards for the Home Electronic System architecture, product interoperability, data security, functional safety, and device discovery and integration on a network. The architecture standard accommodates national and regional standards around the world. About a dozen countries send experts to participate at WG 1 meetings held twice yearly. WG 1 maintains liaisons with the ITU-T and other standards bodies involved with multimedia systems, cabling systems, applications and safety.

WG 1 maintains formal and informal liaisons, which include, but are not limited to, the following standards bodies:

- ISO/IEC JTC 1/SC 6/WG 3, Physical Layer
- ISO/IEC JTC 1/SC 22, Programming Languages, their Environments and Systems Software Interfaces
- ISO/IEC JTC 1/SC 25/WG 3, Customer Premises Cabling
- ISO/IEC JTC 1/SC 27, Information Security Techniques
- ISO/IEC JTC 1/SC 32, Data Management and Interchange
- ISO/IEC JTC 1/SC 36, Information Technology for Learning, Education and Training
- IEC TC 65, SC 65C, Field Bus
- IEC SC 77B/WG 5 Mains Signaling
- IEC TC 79, Alarm Systems
- IEC SC 86C, Fibre Optics
- IEC TC100, Audio/Video
- IEC ACOS WG 1, Advisory Committee on Safety
- ISO TC 205/WG 3, Building Automation and Protocols
- ITU-T, SG-9, Video Distribution
- CENELEC TC205 WG 5, Gateways
- CENELEC TC205 WG 16, Monitor Single Residential Environment in Europe
- INCITS R1.1, Real-time Systems
- Broadband Forum
- GridWise Architecture Council
- UPnP Forum™

WG 1 approved the following key standards for publication:

- IEC 60948 Ed. 1.0 (1988-06) *Information technology – Home Electronic Systems (HES) – Numeric Keyboard for Home Electronic Systems (HES)*
- ISO/IEC 10192-1 Ed. 1.0 (2002-08) *Information technology – Home Electronic Systems (HES) interfaces – Part 1: Universal Interface (UI) Class 1*
- ISO/IEC 10192-2 Ed. 1.0 (2000-10) *Information technology – Home Electronic Systems (HES) interfaces – Part 2: Simple Interface Type 1*
- ISO/IEC 14543-2-1: 2006-08 *Information technology – Home Electronic Systems (HES) Architecture – Part 2-1: Introduction and device modularity*



- ISO/IEC 14543-3-1: 2006-08 *Information technology – Home Electronic Systems (HES) Architecture – Part 3-1: Communication layers – Application layer for HES Class 1*
- ISO/IEC 14543-3-2: 2006-08 *Information technology – Home Electronic Systems (HES) Architecture – Part 3-2: Communication layers – Transport, network and general parts of data link layer for HES Class 1*
- ISO/IEC 14543-3-3: 2007-01 *Information technology – Home Electronic Systems (HES) Architecture – Part 3-3: User process for network-based control of HES Class 1*
- ISO/IEC 14543-3-4: 2007-01 *Information technology – Home Electronic Systems (HES) Architecture – Part 3-4: System management – Management procedures for network based control of HES Class 1*
- ISO/IEC 14543-3-5: 2007-05 *Information technology – Home Electronic Systems (HES) Architecture – Part 3-5: Media and media dependent layers – Power line for network based control of HES Class 1*
- ISO/IEC 14543-3-6: 2007-01 *Information technology – Home Electronic Systems (HES) Architecture – Part 3-6: Media and media dependent layers – Network based on HES Class 1, twisted pair*
- ISO/IEC 14543-3-7: 2007-01 *Information technology – Home Electronic System (HES) Architecture – Part 3-7: Media and media dependent layers – Radio frequency for network based control of HES Class 1*
- ISO/IEC 14543-4-1 *Information technology-Home Electronic Systems (HES) Architecture – Part 4-1: Communications layers – application layer for the network enhanced control devices of HES Class 1*
- ISO/IEC 14543-4-2 *Information technology – Home Electronic Systems (HES) Architecture – Part 4-2: Communications layers – Transport, network and general parts of data link layer for network enhanced control devices of HES Class 1*
- ISO/IEC TR 14543-4: 2002-10 *Information technology – Home Electronic Systems (HES) Architecture, Part 4: Home and building automation in a mixed-use building*
- ISO/IEC 14762 *Information technology – Functional safety requirements for Home Electronic Systems (HES)*
- ISO/IEC 15044 Ed. 1.0 (2000-08) *Information technology – Terminology for the Home Electronic Systems (HES)*
- ISO/IEC 15045 Ed. 1-0 (2004-01) *Information technology – HES HomeGate – Part 1: A Residential gateway model for HES*
- ISO/IEC TR 15067-2 (1997-08) *Information technology – Home Electronic Systems (HES) application model – Part 2: Lighting model for HES*
- ISO/IEC TR 15067-3 Ed. 1.0 (2000-10) *Information Technology – Home Electronic Systems (HES) application model – Part 3: Model of an energy management system for HES*
- ISO/IEC TR 15067-4 Ed. 1.0 (2001-06) *Information technology – Home Electronic Systems (HES) application model – Part 4: Security system for HES*
- ISO/IEC 18012-1 Ed. 1.0 (2004-07) *Information technology – Home Electronic Systems (HES) – Guidelines for product interoperability – Part 1: Introduction*
- ISO/IEC 24767-1 *Information technology – Home network security – Part 1: Security requirements and internal security services: Secure communication middleware protocol*
- ISO/IEC 24767-2 *Information Technology – Home network security – Part 2: External security service*

WG 1 is working on the following key projects, among others:

- FDIS 14543-5-1 *Information technology – Home Electronic Systems (HES) Architecture – Intelligent grouping and resource sharing for HES Class 2 & Class 3 – Part 5-1: Core Protocol*
- CD 14543-5-21 *Information technology – Home Electronic Systems (HES) Architecture – Intelligent grouping and resource sharing for HES Class 2 & Class 3 – Part 5-21: Application Profile – AV Profile*
- CD 14543-5-22 *Information technology – Home Electronic Systems (HES) Architecture – Intelligent grouping and resource sharing for HES Class 2 & Class 3 – Part 5-22: Application profile – File profile*
- CD 14543-5-3 *Information technology – Home Electronic Systems (HES) Architecture – Intelligent grouping and resource sharing for HES Class 2 & Class 3 – Part 5-3: Basic application*
- FDIS 14543-5-4 *Information technology – Home Electronic Systems (HES) Architecture – Intelligent grouping and resource sharing for HES Class 2 & Class 3 – Part 5-4: Device certification*
- CD 14543-5-5 *Information technology – Home Electronic Systems (HES) Architecture – Intelligent grouping and resource sharing for HES Class 2 & Class 3 – Part 5-5: Device type*

- CD 14543-5-6 *information technology – Home Electronic Systems (HES) Architecture – Intelligent grouping and resource sharing for HES Class 2 & Class 3 – Part 5-6: Service type*
- FCD 15045-2 *information technology – HES Residential Gateway, Part 2: Modularity and protocol.*
- FCD 18012-2 *information technology – Guideline for Product Interoperability for HES, Part 2: Taxonomy and lexicon (Approved)*
- CD 20587 *information technology – A Broadband Home Network for the Home Electronic Systems (HES)*
- FCD 29104-1 *information technology – Centralized Management Protocol (CMP) for ubiquitous home network services – Part 1: Remote management of residential gateways*
- FCD 29104-2 *information technology – Centralized Management Protocol (CMP) for ubiquitous home network services – Part 2: Remote management of application servers*
- FCD 29104-3 *information technology – Centralized Management Protocol (CMP) for ubiquitous home network services – Part 3: Remote management of networked home devices by user terminals*
- NWIP *WiBEEM Standard for Wireless Home Network Services*

ISO/IEC JTC 1/SC 25/WG 3 – Customer Premises Cabling develops generic telecommunications cabling standards. These standards support a wide variety of applications including voice, data, video and building automation. The group has participation from more than 22 countries**.**

The group cooperates with the TIA TR-42 subcommittees that are developing U.S. cabling standards and provides the primary technical basis to formulate the U.S. contributions and ballot responses for SC 25 WG 3. Collaboration with other key committees includes other ISO/IEC JTC 1 committees, SC 25 WG 1 and WG 4, and SC 6; IEC committees include TC 46, TC 48, TC 86, TC 100, and SC 65C; outside ISO/IEC, other committees, such as IEEE 802, and ITU-T, act as the customers for SC 25 WG 3, developing applications for cabling systems.

The group collaborates with IEC committees TC 46, TC 48, and TC 86 and provides the cable and connector components standards referenced by this working group to ensure performance and reliability for configured implementations according to its cabling standards. These IEC committees also specify the environmental conditions and test methods supporting the performance and reliability requirements.

Bilateral exchange takes place with regional and national standards organizations such as TIA, European Committee for Electrotechnical Standardization (CENELEC), Japanese Standards Association (JSA), Australian/New Zealand Standards (AS/NZS) and others, and harmonization is maintained among international and regional standards.

Continuing cooperation with IEC SC 65C has resulted in further publications of ISO/IEC-related standards to 24702: *Generic cabling for the industrial premises*.

Close cooperation with IEC TC 86 is providing test specifications for installed cabling systems and assemblies including amendments and a revision of ISO/IEC 14763-3: *Information technology – Implementation and operation of customer premises cabling – Part 3*.

WG 3 published standards in the area of structure, minimum performance and interfaces of premises cabling:

- ISO/IEC 11801, Ed. 2: 2002*, Generic Cabling for Customer Premises*
- Amendment 1 to ISO/IEC 11801: to, e.g. cabling classes up to 500 MHz and 1 GHz
- ISO/IEC 24702: *ICT cabling systems for industrial premises*.
- ISO/IEC 15018: *Generic cabling system for homes*

Implementation and operation of customer premises cabling:

- ISO/IEC 14763 *Part 3: Testing of optical fibre cabling*
- ISO/IEC 14763 *Part 1: Administration plus Amendment 1*
- ISO/IEC TR 14763 *Part 2: Planning and installation*

Configuration of customer premises cabling for applications:

- ISO/IEC TR 24750*: Assessment of installed cabling performance for 10GBASE-T*
- ISO/IEC TR 29106: *cabling for industrial premises, MICE tutorial*
- ISO/IEC TR 24704*: Customer premises cabling for wireless access points*
- ISO/IEC TR 24746: *Mid-span DTE power insertion into generic cabling*
- ISO/IEC 18010: *Information technology – Pathways and spaces for customer premises cabling*

- Amendment 1 to ISO/IEC 18010: *for multi-tenant buildings*
- ISO/IEC 14709 Part 1: *ISDN basic access plus Amendment 1*
- ISO/IEC 14709 Part 2: *ISDN Primary Access*

WG 3 continues work in the area of structure, minimum performance and interfaces of premises cabling

- ISO/IEC 24764: *Generic cabling for data centres*
- Amendment 2 to ISO/IEC 11801: *to e.g., cabling classes up to 500 MHz and 1 GHz*
- Amendment 1 to ISO/IEC 24702: *on polymer optical fibre (POF)*
- Amendment 1 to ISO/IEC 15018: *on baluns*
- Amendment 2 to ISO/IEC 15018: *on optical fibre*

Implementation and operation of customer premises cabling:

- ISO/IEC 14763 *Part 2: (revision to full standard) Planning and installation*
- Amendment 1 to ISO/IEC 14763-3: *Testing of optical fibre cabling*

Configuration of customer premises cabling for applications:

- ISO/IEC 29125: *Telecommunications cabling guidelines for remote powering of data terminal equipment*

CHART 1: THE MOST RECENT REVISIONS OF DOCUMENTS BEING DEVELOPED BY THE INTERNATIONAL COMMITTEE FOR INFORMATION TECHNOLOGY STANDARDS (INCITS)

ISO Part Number	Name of Standard	Title	Status	Developing Organization
14165-116	10GFC	10 Gigabit Fibre Channel	Published	INCITS T11
14165-521	FAIS	Fabric Application Interface Standard	Published	INCITS T11
14165-312	FC-AE-1553	Fibre Channel Avionics Environment – ULP MIL-STD-1553B	Approval	INCITS T11
14165-313	FC-AE-ASM	Fibre Channel Avionics Environment – Anonymous Subscriber Messaging	Approved	INCITS T11
14165-314	FC-AE-RDMA	Fibre Channel Avionics Environment – SCSI-3 Remote Direct Memory Access	Approved	INCITS T11
14165-122	FC-AL-2	Fibre Channel Arbitrated Loop – Second Generation	Published	INCITS T11
14165-321	FC-AV	Fibre Channel Audio-Video	Approved	INCITS T11
14165-243	FC-BB-3	Fibre Channel Backbone – 3	Approved	INCITS T11
14165-341	FC-DA	Fibre Channel Device Attach	Approved	INCITS T11
14165-252	FC-FS-2	Fibre Channel Framing and Signaling – 2	Approved	INCITS T11
14165-414	FC-GS-4	Fibre Channel Generic Services – 4	Published	INCITS T11
14165-261	FC-LS	Fibre Channel Link Services	NWIP	INCITS T11
14165-372	FC-MI-2	Fibre Channel Methodologies for Interconnects – 2	Approved	INCITS T11
14165-117	FC-MJSQ	Fibre Channel Methodologies for Jitter and Signal Quality	Published	INCITS T11
14165-142	FC-PI-2	Fibre Channel Physical Interfaces – 2	Approved	INCITS T11
14165-223	FC-SB-3	Fibre Channel Single Byte Command Code Sets	Approved	INCITS T11
14165-120	FCSM	Fibre Channel Signal Modeling	Approved	INCITS T11
14165-134	FC-SW-4	Fibre Channel Switch Fabric – 4	Approved	INCITS T11
14165-431	FC-SP	Fibre Channel Security Protocols	Approved	INCITS T11
14165-331	FC-VI	Fibre Channel Virtual Interface	Published	INCITS T11
24775	SMS	Storage Management	Published	SNIA
11002	MMA	Multipath Management API	Published	SNIA
11989	IMA	iSCSI Management API	Approved	SNIA

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

WG 4 maintains liaisons with JTC 1 committees working on network standards and with IEC committees working on component as well as on multimedia standards. These include, but are not limited to, IEC TC 86 Fibre Optics and IEC TC 65 Field Bus.

There are about 25 active projects, and the working group published eight standards last year. Most of these projects were initiated by industry; expanded and reviewed in detail in the 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 WG 4's Program of Work. These include:

- The Fibre Channel family of standards implementing Storage Area Networks (SANs). Versions of Fibre Channel support the SCSI command set, three different avionic buses, and Fibre Connectivity (FICON), the latest generation of the IBM Enterprise Systems Connection (ESCON) interface.
- The Small Computer System Interface (SCSI) family of protocols and commands used for all open storage devices and nearly all enterprise storage devices and for all multi-media CD drives. This includes serial attached SCSI, Fibre Channel, Universal Serial Bus (USB), Fibre Channel over Ethernet (FCoE), and Internet SCSI (iSCSI).
- Parallel and serial ATA family of standards used for the attachment of small disks in all personal computers and many small servers.
- Storage management standards and Application Programming Interfaces (APIs).
- The Floating Point processors used in nearly all computers (update pending).
- Responsive link, a real-time network for embedded systems, particularly robotics.
- A variety of standard computer backplanes and interconnect interfaces, including Rapid I/O, VME, VMS, and SBus.

Standards processed by WG 4 are used throughout the world in more than a billion computing and storage systems.

Charts 1 and 2 show the latest revision of the relevant documents that are being approved or have been published by JTC 1 SC25 WG 4. In most cases, previous revisions of the documents undergoing approval are already published as International Standards. In many cases, new revisions introducing advanced and improved technologies are being developed by the responsible organizations and have not yet been submitted for international standardization.

ISO/IEC JTC 1/SC 25 Project Team for Taxonomy and Terminology (PTTT) resulted from a special meeting held in March 2006, which provided recommendations to make use of the estab-

CHART 2: PRINCIPAL SCSI STANDARDS

ISO Part Number	Name of Standard	Title	Status	Developing Organization
14776-413	SAM-3	SCSI Architectural Model – 3	Published	INCITS T10
14776-453	SPC-3	SCSI Primary Command Set – 3	Approved	INCITS T10
14776-321	SBC-2	SCSI Block Command Set – 2	Published	INCITS T10
14776-326	RBC-2	SCSI Reduced Block Command Set – 2	Approved	INCITS T10
14776-331	SSC	SCSI Stream Commands	Published	INCITS T10
14776-351	SMC	SCSI-3 Media Changer Commands	Published	INCITS T10
14776-362	MMC-2	SCSI-3 Multi-Media Commands	Published	INCITS T10
14776-372	SES-2	SCSI-3 Enclosure Services – 2	NWIP	INCITS T10
14776-115	SPI-5	SCSI-3 Physical Interface – 5	Published	INCITS T10
14776-151	SAS - 1.1	Serial Attached SCSI	Approved	INCITS T10
14776-223	FCP-3	Fibre Channel Protocol for SCSI – 3	Published	INCITS T10
14776-921	SAT	SCSI to ATA Translation	NWIP	INCITS T10
14776-232	SBP-2	Serial Bus Protocol – 2 (For IEEE 1394 bus)	Published	INCITS T10

lished cooperation between ITU-T and ISO/IEC JTC 1 in the development of specifications with common or aligned text through the formation of a project team directly under SC 25.

These recommendations were processed at the plenary of SC 25 in September 2006. At this meeting, SC 25 resolved to update its scope and to create PTTT. This team works jointly with ITU-T, subcommittees of the IEC and JTC 1 to provide common tools instrumental in the development of a consistent set of standards for intelligent homes. PTTT has been chartered with responsibility for two projects:

IT – Intelligent homes – Taxonomy of specifications (1.25.05.01)

IT – Terminology for intelligent homes (1.25.05.02).

The experts of WG 1 met jointly with PTTT in Lyon, France, the week of October 20, 2008. The United States was represented by Ron Ambrosio, Dr. Tim Schoechle, Dr. Ken Wacks and Grace Wei.

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

US TAG CHAIR: JOHN SIEMON
The Siemon Company

ISO/IEC JTC1/SC 25 WG 1 –
Home Electronic System
US TAG CHAIR: DR. KEN WACKS
MIT

ISO/IEC JTC1/SC 25 WG 3 –
Customer Premises Cabling
US TAG CHAIR: DAVID HESS
Nexans

ISO/IEC JTC1/SC 25 WG 4 –
Microprocessor Interconnection of Computer Systems and Attached Equipment
FORMER US TAG CHAIR: ROBERT SNIVELY

ISO/IEC JTC 1/SC 25 COMMITTEE PARTICIPANTS

ADC, Agilent Technologies, Inc., Bel Stewart Connectors, Berk-Tek, Brocade Communications, CommScope Network Div., Corning Inc., CyberLYNX - Gateway Corporation, Echelon Corporation, EMC Corporation, Fluke Networks, General Cable, HARTING, Inc. of North America, IBM, Ideal Industries, Inc., Intel Corp., J&M Consultants, Inc., JPMorgan Chase & Co., Leviton Network Solutions, LONMARK International, MIT, Molex Inc., Nexans, Open Devicenet Vendor Association, Inc., Panasonic Computer Solutions, Panduit Corporation, PPC, R.L. Pritchard, Sony Electronics, Surtec America, The Siemon Company, The Wiremold Company, Tyco Electronics

In Remembrance, Robert Snively July 27, 1942- January 17, 2009

Before becoming head of the U.S. advisory group to SC 25/WG 4, Bob was an engineer at IBM, Sun Microsystems and Brocade Communications. He helped define the pathway of information storage protocols and technology from the inception of SCSI to the development and expansion of Fibre Channel. As the chair of multiple technical committees, Bob defined rational interfaces to shape the future of storage connections. He will be missed by the SC 25 community.

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 and accessories for analog and digital transmission systems and equipment for communications networks and cabling. TC 46 has internal IEC liaisons with SC 48B, SC 65C, SC 86A and TC 100. Liaison relationships are also maintained with the International Telecommunication Union (ITU), and the International Telecommunication Union - Radiocommunications (ITU-R) and International Telecommunication Union - Telecommunications (ITU-T) divisions.

2008 OVERVIEW

In TC 46, the U.S. Expert is the International Secretary, and the United States holds the Secretariat. The committee is comprised of 24 countries-participants who are full-fledged members ("P" members) of the IEC program and 13 countries participate as observers ("O" members). The committee has three subcommittees (SC 46A on Coaxial Cables, SC 46C on Wires and Symmetric Cables and SC 46F on R.F. and Microwave Passive Components) each subcommittee has its own working groups and project teams.

In addition, TC 46 is directly responsible for three working groups that develop standards in specific areas: these are WG 5 on Screening Effectiveness, WG 6 on Passive Intermodulation Measurement (PIM) and WG 9 on Metallic Cable Assemblies for ICT.

The main task of WG 5 is to develop and maintain standards relating to the electromagnetic compatibilty (EMC) performance (shielding and screening tests) of coaxial and symmetric cables and R.F./microwave passive devices (connectors and waveguides).

The main task of WG 6 is to prepare test methods and to investigate relevant limits for Passive Intermodulation in the R.F. and microwave frequency range for passive components (i.e., connectors, cables, cable assemblies, waveguide assemblies and components). WG 6 also liaises closely with TC 102 for matters relevant to antennas and with SC 48B for connectors with respect to PIM.

The main task of WG 9 is to develop test methods for metallic cable assemblies for Information and Communications Technology (ICT) and multimedia distribution networks and systems.

Eighteen current publications have been issued by TC 46, and 14 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/JWG10 – Industrial Networks; IEC/SC 48B – Connectors and ISO/IEC JTC 1/SC 25 – Interconnection of Information Technology Equipment.

2008 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 R.F. 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 participants and 15 "O" member participants. 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 finish the work on the revision on the generic specification for coaxial cables, IEC 61196-1-x and its different test procedures.

Ninety current publications have been issued by SC 46A, and 48 of these are due for maintenance over the next three years.

The U.S. members of IEC SC 46A voted on 28different documents (11 CDV, 1 NP, six FDIS) in 2008.

During 2008, SC 46A circulated 51 documents, four standard documents have been published, eight documents have been distributed as new work item proposals (NP). The NPs address coaxial cables with PTFE insulation and with tin soaked braids up to 18 GHz.

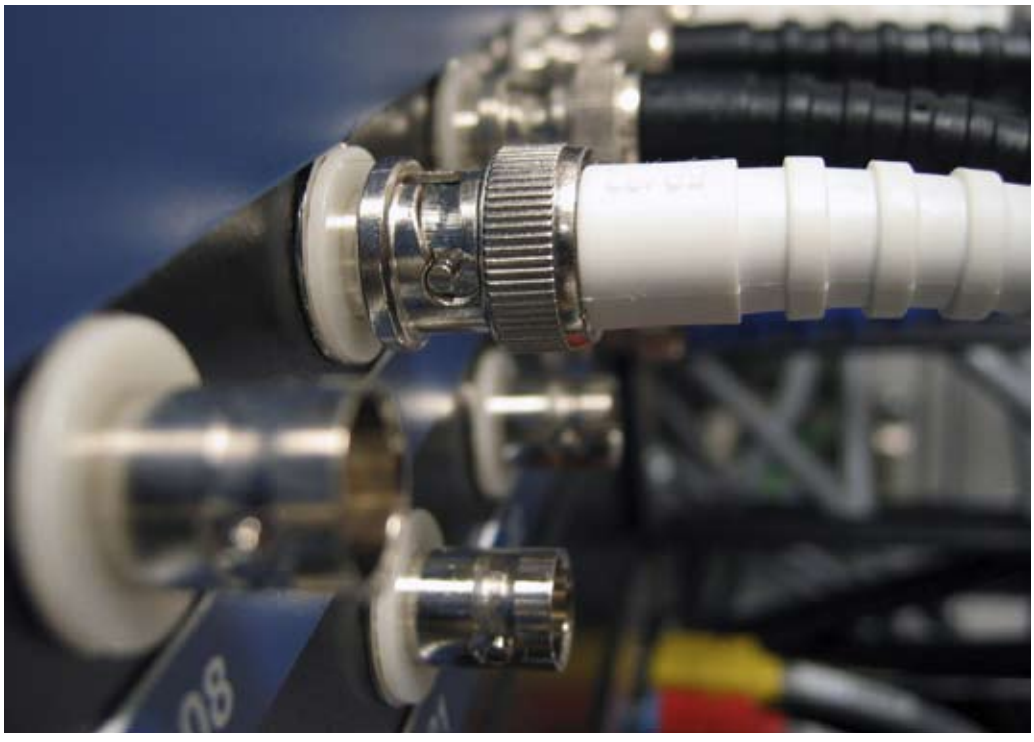
The most recent IEC meeting was held in Xi'an, China. The next meeting will be held in Geneva, and the the IEC General meeting will take place in Tel Aviv, while the 2010 IEC General meeting will be held in Seattle, Washington.

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 participants and 13 "O" member participants. 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 JTC1 SC 25/WG 3 regarding the amendments to IS 11801.

Forty-four current publications have been issued by SC 46C, and 30 of these are due for maintenance over the next three years.

The United States hosted a SC 46C/WG 7 meeting in Philadelphia, May 6-9, 2008. The last IEC Meeting was held in November in Xi'an, China. The IEC General meeting will take place in Tel Aviv, while the 2010 meeting will be held in Seattle, Washington.

IEC-SC46F, R.F. and Microwave Passive Components, develops standardization of R.F. and microwave passive components used in networks and cabling, including test methods for electrical, mechanical and environmental



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

TECHNICAL ADVISOR & SECRETARY: JOHN KINCAID
CommScope

TECHNICAL ADVISOR & CONVENER: DAVID WILSON
CommScope

DEPUTY TECHNICAL ADVISOR: ROGER MATTHEWS
PPC

IEC TAG TC 46 COMMITTEE PARTICIPANTS

ADC, Andrew Corporation, Applied Engineering Products, Inc., Berk-Tek, CommScope Network Div., Copperweld Bimetallic Product Business, Corning Inc., Defense Supply Center Columbus, Fluke Networks, General Cable, Ideal Industries, Inc., Jesch Consulting Company, PPC, SV Microwave, TFC/Amphenol, The Siemon Company

characteristics, as well as product standards. The committee is comprised of 17 "P" member participants and 14 "O" member participants.

The subcommittee has formal liaisons with TC 100 – Audio, video and multimedia systems and equipment, JTC1/SC 25 – Interconnection of information technology equipment, IEC TC 100/TA 5 – Cable networks for television signals, sound signals and interactive services, IEC TC 46/WG 5 : Screening effectiveness, IEC TC 46/WG 6: Passive Intermodulation Measurement (PIM), IEC SC 46A – Coaxial cables, IEC SC 46C – Wires and symmetric cables, IEC TC 48 – Electromechanical components and mechanical structures for electronic equipment, IEC SC 48B – Connectors, IEC TC 51 – Magnetic components and ferrite materials, IEC SC 86B – Fibre optic interconnecting devices and passive components, TC 103 – Transmitting equipment for radio communication, TC 104 – Environmental conditions, classification and methods of test.

SC 46F has 12 Project Teams which deal with various Radio Frequency connectors. It also has three Maintenance Teams. MT 61169-1 – United States is appointed Convener, MT 61169-14 – United States is appointed project leader, SC 46F has four new proposals in the pipeline.

In the past 12 months, two standards and three PAS have been approved, and four New Proposals were issued.

One hundred and two current publications have been issued by SC 46F and 34 of these are due for maintenance over the next three years.

The next general meeting of SC 46F is tentatively scheduled for October 18-22, 2009, in Tel Aviv while the 2010 meeting will be held in Seattle, Washington.

TC 76: Optical Radiation Safety and Laser Equipment

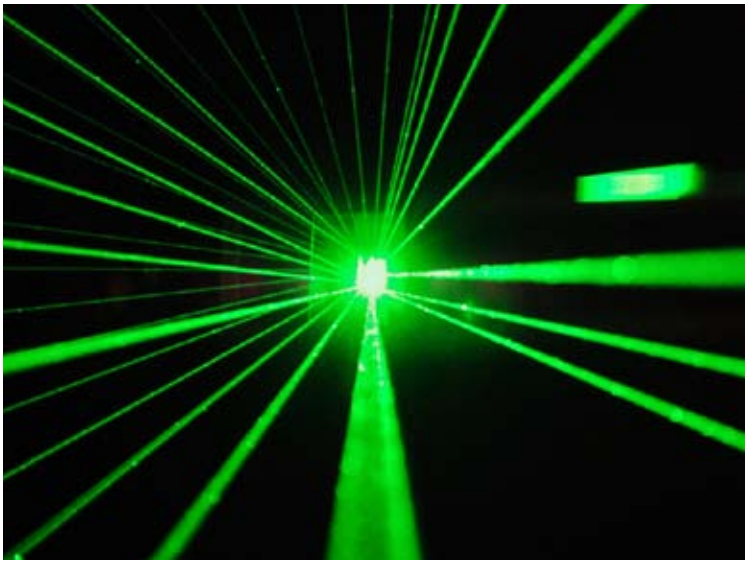
IEC TC 76 DEVELOPS AND MAINTAINS SAFETY STANDARDS FOR PRODUCTS that generate laser and other optical radiation. The products covered range from fiber optic and free-space telecommunications systems and other information technology equipment to industrial, medical and entertainment products. Standards relating to the safety of these products are vital to achieving market acceptance. The standards need not only to assure safety but also to be practical, in that they do not impose 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.

2008 OVERVIEW

IEC/TC 76 maintains liaisons with the following IEC Committees:

IEC/TC 66 – Safety of measuring, control and laboratory equipment – Equipment under the purview of TC 66 often incorporates lasers or other optical radiation sources. TC 76 monitors TC 66 documents and provides comments or consultation as needed.

IEC/TC 86 – Standards for fiber optic systems, modules, devices and components intended primarily for use with communications equipment. TC 76 monitors TC 86 documents and provides comments or consultation as needed or requested.



IEC/TC 92 is now merged into TC 108, responsible for audio, video and other consumer electronic equipment, which often incorporate lasers or other optical radiation sources. TC 76 monitors TC 92/108 documents and provides comments or consultation as needed.

IEC/TC 110 – flat panel display devices. This equipment generates optical radiation; therefore, TC 110 documents reference TC 76 documents for radiation safety issues.

ISO/TC 172 – ISO/TC 172/SC 9 liaison. This is 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.

CIE – ICNIRP – ICNIRP establishes safe exposure limits for non-ionizing, including optical, radiation. Liaison is maintained by joint membership. TC 76 develops hazard classifications based on the International Commission for Non-ionizing Radiation Protection (ICNIRP) exposure limits. 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.

2008 ACTIVITIES

There are seven working groups in TC 76. These working groups develop and maintain their respective specialty interests in the IEC 60825, Safety of Laser Products Part 1: Equipment classification and requirements 62471, 60601-Medical electrical equipment) and ISO 11553 series as follows:

WG 1, Optical Radiation Safety, reviews biological and physical data and makes recommendations/revisions of 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 results in an increased hazard for viewing, with the possible result of elimination of one of the measurement conditions for classification of laser products. This has particular application for optical fibers in communications equipment.

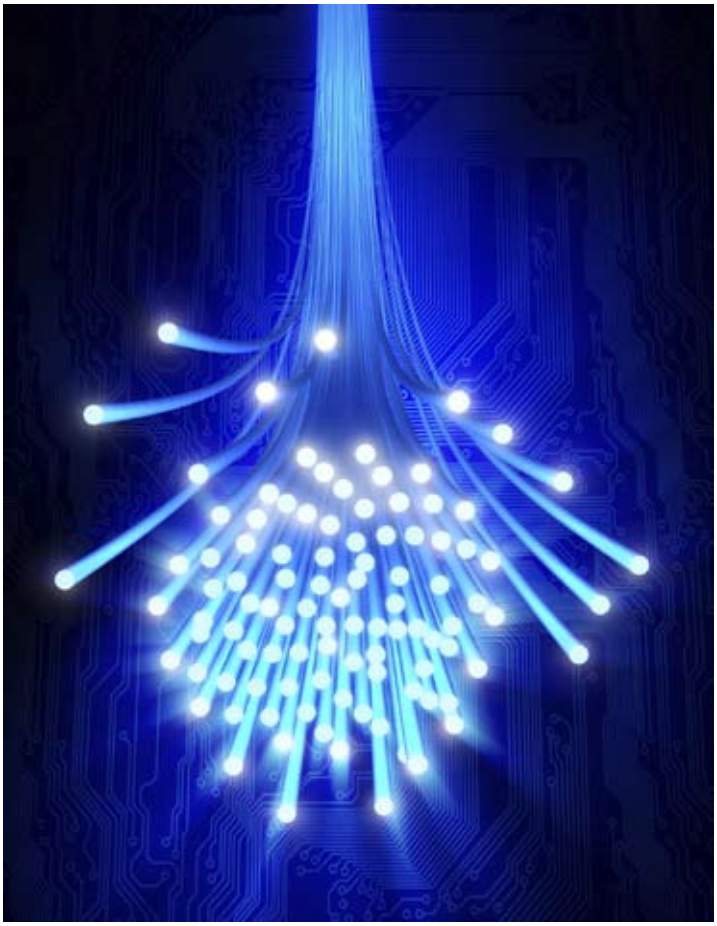
WG 3, Laser Radiation Measurement, develops and maintains, as necessary, technical reports to be used as guides in making radiometric measurements of laser radiation levels for comparison with the AEL and MPE and performing hazard evaluations pursuant to IEC 60825-1. This WG is developing an amendment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

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

WG 5, Safety of Fiber Optics Communications Systems, deals with the safety of fiber optics communications systems. The WG develops international standards on safety of fiber optics consistent with IEC 60825 in coordination with other relevant technical committees. This includes enclosed transmission systems and semiconductor lasers. An interpretation sheet (ISH) has been issued stating that Edition 1.2 of IEC 60825-1 should be used with fiber optic communications 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 complete editing of IEC 60825-1, complete development of a laser-light show document, a complete labels and symbols document, and a manufacturer's checklist standard. This WG is responsible for the new edition of IEC 60825-3, a technical report addressing the safety of laser-light shows and displays. The WG is also working on simplified labeling and the withdrawal of the TR 60825-10.

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

WG 10 (joint with ISO TC 172/SC 9), Laser Machine Tools, develops and maintains the ISO 11553 series of standards. Recent work has been on new standards to address handheld delivery systems and the noise directive in the European Union.

TC 76: OPTICAL RADIATION SAFETY AND LASER EQUIPMENT

CHAIRMAN AND TECHNICAL ADVISOR: JEROME E. (JERRY) DENNIS
FDA/CDRH

SECRETARY: WILLIAM ERTLE
Rockwell Laser Industries

DEPUTY TECHNICAL ADVISOR: ROBERT WEINER
Weiner Associates

IEC TAG TC 76 COMMITTEE PARTICIPANTS

Alcatel-Lucent, AT&T Labs, Bushnell Performance Optics, Corning Inc., David Sliney Consulting, FDA/CDRH, Handren Associates, Inc., IBM, Intertek Testing Services, L.A.I International, Laser Product Safety LLC, Metrologic Instruments, Inc., Naval Surface Warfare Center, NIST, PSC Scanning, Inc., Rockwell Laser Industries, Texas Instruments, Inc., TUV Rheinland of N.A., Inc., U.S. Army Center for Health, Weiner Associates

U.S. votes and comments were submitted on the following standards documents:

- ISH to use Edition 1.2 of IEC 60825-1 for fiber optic communications systems pending revision of IEC 60825-2
- CD for IEC 62471-2 TR for guidance on the use of IEC 60825-1 or 62471-1 for determination of the hazard class of non-laser optical radiation equipment
- CD for IEC 60825-17 regarding passive components in high-power fiber optic communications systems
- CDV for ISO 1155-3 for noise limitation and control for laser machine tools
- FDIS for Annex G of IEC 60825-4 for beam delivery systems
- CD for the revision of IEC 60825-2 for fiber optic communications systems
- CD for IEC 60601-2-57 for intense light equipment for medical or cosmetic applications

TC 76 published the following three documents in 2008:

- Corrigendum for IEC 60825-1
- IEC 60825-4 Ed 2 for laser guards
- IEC 60825-3 TR for the safety of laser light shows and displays

IEC TC 86: Fibre Optics

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.

2008 OVERVIEW

In TC 86, the U.S. Expert is the International Secretary, and the United States also holds the Secretariat. There are two working groups, and the committee has liaisons with EC TC 100 – Audio, video and multimedia systems and equipment and with ITU-T.

In the past year, TC 86 has processed 23 documents and published 10 documents.

US TAG held meetings in Vancouver in October 2008 and in Mesa, Ariz., in February 2009. The IEC General Meeting was held in Kyoto, Japan (October 27- 31, 2008). The US TAG meetings often co-locate with TIA TR-42 committee meetings. The next general meeting will be in Israel in October 2009.

US TAG has liaisons with IEC/TC 100 – Audio, video and multimedia systems and equipment, ITU-T.

There are two working groups: WG 1: Terminology and symbology, and WG 4: Fibre optic test equipment calibration. There is one joint group, JWG 9: Optical functionality for electronic assemblies and one Project Team, PT 62538.

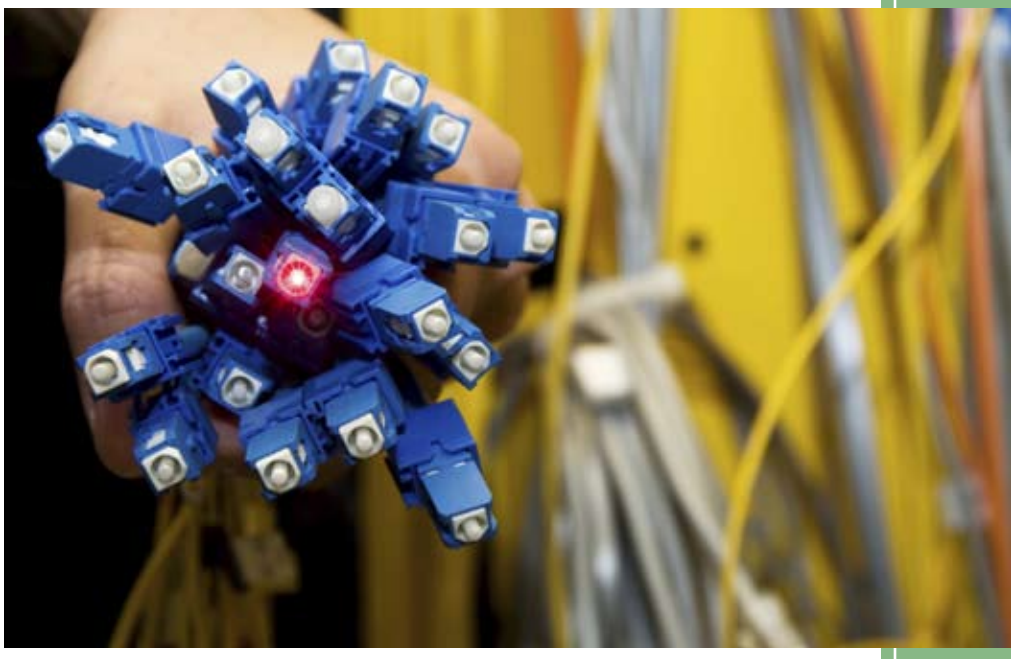
2008 ACTIVITIES

IEC/SC86A – Fibres and Cables prepares international standards for optical fibers 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 fibers and all types of optical fiber 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 – Lightening 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.

The subcommittee has two working groups: WG 1 – Fibres and associated measuring methods, and WG 3 – Cables.

IEC/SC 86B – Fibre Optic Interconnecting Devices and Passive Components, prepares international standards for fiber optic interconnecting devices and passive components, embracing all types of communications



IEC TC 86: FIBRE OPTICS

SECRETARY, TC86: JAMES E. MATTHEWS III (U.S.)
Corning, Inc.

ASSISTANT SECRETARY: ELAINA FINGER (U.S.)
Corning, Inc.

TECHNICAL ADVISOR: TOM HANSON
Corning, Inc.

IEC TAG TC 86 COMMITTEE PARTICIPANTS

ADC Telecomm., Agilent Technologies, Inc., Alcatel-Lucent, Avanex New York, Berk-Tek, Chromis Fibreoptics, CIENA Corporation, Cisco Systems, Inc., CommScope Network Div., Condumex, Inc., Corning Cable Systems, Corning Inc., Defense Supply Center, Diamond USA, Inc., Draka Comteq Optical Fibre, Emtelle US Inc., EXFO E.O. Engineering, Inc., FiberSource Inc., Fluke Networks, General Cable, Greenlee Textron Inc., JDS Uniphase Inc., Noyes Fiber Systems, NSWC DoD, OFS, One Terabit, Optical Test & Standards Consultants, Photon Kinetics, Inc., R.M. MANNING Consulting, Sumitomo Electric Lightwave Corp., The Siemon Company, Tyco Electronics, U.S. Dept. of Commerce, U.S. Navy, US Conec LTD, Westover Scientific, Xtellus Dynamic Optics, Yazaki NA Inc.

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 fiber optic interconnecting devices and passive components.

The subcommittee has liaisons with the following groups: IEC/SC 65C – Industrial networks; ISO/IEC JTC 1/SC 25 – Interconnection of information technology equipment; ITU-T (SG 6) – Outside plant and related indoor installations and ITU-T (SG 15) – Optical and other transport network infrastructures.

The subcommittee has four Working Groups – WG 4: Standard tests and measurement methods for fiber optic interconnecting devices and passive components; WG 6: Standards and specifications for fiber optic interconnecting devices and related components; WG 7: Standards and specifications for fiber optic passive components; and WG COG: Fiber optic interconnecting devices and passive components – Chairman's Officers Group (COG) – Terms of reference.

In the past 12 months, more than 350 documents have been posted and circulated for US TAG review and comments. Fourteen documents are open for voting.

IEC/SC86C – Fibre Optic Systems and Active Devices prepares 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 subcommittee has liaisons with IEC TC 76 – IEC/TC 100, ISO/IEC JTC 1/SC 25, ITU-T SG 6. There are four working groups – WG 1: Fibre optic communications systems and subsystems; WG 3: Optical amplifiers; WG 4: Fibre optic active components and devices; and WG 5: Dynamic modules and devices. The subcommittee has 20 documents open for voting.

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 US 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.

ISO/TC 204 SCOPE

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.

2008 ACTIVITIES

ISO/TC 204 meets twice a year. The first meeting in 2008 took place April 14-18, 2008, in Munich, Germany.

New work items approved for adoption in Munich include:

- (WG 1) Business Integration Architecture
- (WG 17) The Use of Nomadic and Mobile Devices to Support ITS Service and Multimedia Provision for Travelers
- (WG 9) Data Interfaces Between Centers for Transport Information and Control Systems Using XML (in cooperation with CEN TC 278 WG 8)

Work items approved for publication in Munich include:

- (WG 16) 22837 Vehicle Probe Data for Wide Area Communication
- (WG 9) 15784 Parts 1 & 3 Data Exchange Involving Roadside Modules Communication

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

ISO/TC 204 LEADERSHIP

Committee Chair (U.S.): Michael Noblett, *Connexis LLC*

Committee Vice-Chair (Japan): Prof. Hironao Kawashima, *Center for Open Systems Management, Faculty of Science & Technology, Keio University*

Secretary (U.S.): Andrew Dryden, *Telecommunications Industry Association (TIA)*

WORKING GROUPS

WG 1: Architecture
CONVENOR: Ms. Zeina Nazer, *United Kingdom*

WG 3: ITS Database Technology
CONVENOR: Mr. Jun Shibata, *Japan*

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

WG 5: Electronic Fee & Toll Collection
CONVENOR: Mr. Jesper Engdahl, *Sweden*

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

WG 8: Public Transport/Emergency
CONVENOR: Mr. Koorosh Olyai, *USA*

WG 9: Integrated Transport Information, Management & Control
CONVENOR: Mr. Dean Zabrieszach, *Australia*

WG 10: Traveler Information Systems
CONVENOR: Mr. Paul Burton, *Germany*

WG 14: Vehicle/Roadway Warning and Control Systems
CONVENOR: Mr. Yoshimi Furukawa, *Japan*

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

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

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

US TAG ISO/TC 204 LEADERSHIP

US TAG Chair: Richard Weiland, *Ygomi LLC*

WORKING ADVISORY GROUPS

WAG 1: Architecture
CHAIR: Mr. Thomas Kurihara, IEEE

WAG 3: ITS Database Technology
CHAIR: Mr. Thomas Lydon, NAVTEQ

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

WAG 5: Electronic Fee & Toll Collection
CHAIR: Vacant

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

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

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

WAG 10: Traveler Information Systems
CHAIR: Mr. 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: Mr. Richard Schnacke, Transcore

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

WAG 17: Nomadic Devices
CHAIR: Vacant

▶ (WG 14) 22178 Low Speed Following Systems
▶ (WG 14) 22179 Full Speed Range Adaptive Cruise Control Systems

The committee also agreed to launch a revision/amendment process for the following work items:

▶ (WG 5) 14906 AID for DSRC
▶ (WG 5) 14907-1 Electronic Fee Collection (EFC) – Test Procedures for User and Fixed Equipment – Part 1: Description of Test Procedures
▶ (WG 5) 17574 Electronic Fee Collection (EFC) – Guidelines for EFC Security Protection Profiles
▶ (WG 14) 15623 FVCWS (Forward Vehicle Collision Warning Systems)

The second meeting of ISO/TC204 took place November 10-14, 2008, in Ottawa, Canada.

New work items adopted in Ottawa include:

▶ (WG 1) Business Case Template for ITS Projects
▶ (WG 10) TTI via Transport Protocol Expert Group (TPEG) Services, UML Modeled
▶ (WG 16) CALM Security Part 1: Framework
▶ (WG 16) CALM Security Part 2: Threat Vulnerability and Risk Analysis
▶ (WG 16) CALM Security Part 3: Objectives and Requirements
▶ (WG 16) CALM Security Part 4: Countermeasures
▶ (WG 16) CALM Receiving Public Broadcast Communications
▶ (WG 17) Vehicle Interface for Provisioning and Support of ITS Services
▶ (WG 17) Real-time Decision Support System at Four-Way Stop Controlled Intersection via Nomadic and Portable Devices

Work items approved for publication in Ottawa include:

▶ (WG 1) 14813-5 Requirements for Architecture Description in ITS Standards
▶ (WG 16) 24978 ITS Safety and Emergency Messages Using Any Available Wireless Media – Data Registry Procedures
▶ (WG 16) 21217 CALM Architecture
▶ (WG 16) 24103 CALM MAIL

In 2009, ISO/TC 204 met in May in Thailand and will meet in September in Spain.

The US TAG to ISO/TC 204 typically meets three to four times a year and maintains extensive e-mail correspondence for the purpose of formulating U.S. positions on the technical issues of the TC. In 2009, the US TAG met in January, April and July.

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 member companies of five standards developing organizations to create globally-applicable third-generation and beyond wireless communications specifications based on cdma2000® technology. These specifications are then submitted to the project's organizational partners for conversion into standards.

3GPP2 continued its aggressive 10 week-long meeting schedule in 2008. Its expert volunteers developed and published more than 120 specifications and reports in 2008. The UMB-1 release of the cdma2000 System Specifications was published in May.

Also in May 2008, 3GPP2 held a Future Directions and IMT Advanced workshop in Osaka, Japan. The workshop's goal was to define the path of 3GPP2's future development efforts and direction. This vision will include:

1. Enabling highly efficient wireless communication technologies of the cdma2000® family by evolving the technologies to maximize use of existing deployments of cdma2000-1X and HRPD;

2. Delivering, with 1X-Enhanced, the highest voice capacity per MHz of spectrum among any known systems, with the goal of more than tripling that capacity relative to the currently deployed cdma2000-1X;

3. Delivering, with HRPD-Enhanced, the most spectrally efficient wide area wireless mobile packet data system;

4. Positioning 1X-Enhanced and HRPD-Enhanced as critical long-term components of evolving wireless technology platforms worldwide.

2009 began with a change of leadership within 3GPP2. TIA assumed the chairmanship of 3GPP2's Steering Committee, the body responsible for overseeing the 3GPP2's technical work.

THIRD GENERATION PARTNERSHIP PROJECT 2 (3GPP2)

3GPP2 COMMITTEE PARTICIPANTS

Aeroflex, Agilent Technologies, AirCell, LLC., Airvana, Alcatel-Lucent, Alcatel Shanghai Bell, Award Solutions, Inc., Bell Canada, Bridgewater Systems Corporation, China Telecom, Dolby Laboratories, Inc., Ericsson Wireless Communications, Inc., ETRI, France Telecom R&D, Gemalto, Inc., Hitachi, Ltd., Huawei Technologies Co., Ltd., KDDI Corporation, KT Freetel, Kyocera Corporation, LG Electronics, LG Telecom, Ltd., Motorola, Inc., National Communications System, NEC Corporation, Nokia Siemens Networks, Nortel Networks, Oki Electric Industry Co., Ltd, Qualcomm Inc., Redknee, Inc., Research In Motion Corporation, Research Institute of Telecommunication Translation, MII, Rohde&Schwarz, America, Samsung Electronics Co., Ltd., SGS Wireless US, Inc , Sierra Wireless, SK Telecom, Skyterra Communications, Sony Ericsson Mobile Communications Japan, Inc., Spirent Communications, Sprint Nextel, Starent Networks Corporation, Tatara Systems, Telcordia Technologies, Inc., TeleCommunication Systems, Inc., Telespree Communications, Toshiba Corporation, US Cellular, UTStarcom, Inc, Verizon Wireless, VIA Telecom, Inc., ZTE Corporation

This transition was accompanied by leadership elections and changes in 3GPP2's four Technical Specification Groups (TSGs). Three of the TSG Chair positions were assumed by TIA members.

As 3GPP2 celebrates its 10th anniversary in 2009, its members will focus on not only the vision expounded upon in last year's workshop but Release 6 of the cdma2000 wireless telecommunications system, scheduled for release in late 2009. High priority for 3GPP2 in 2008 was the development of the four work items deemed critical to Release 6.

- WLAN-cdma2000® 1X Circuit-Switched Voice Interworking
- Support for 3GPP2 cdma2000® (HRPD and 1XRTT) and 3GPP E-UTRAN (LTE) Mobility Interworking and Inter-Technology Handoff
- Inter-Technology Handoff Support for HRPD-WiMAX
- Enhancement of the cdma2000 1x System

As of December 2008, the cdma2000 customer base exceeded 463 million subscribers, per CDMA Development Group (CDG) statistics.

For more information on 3GPP2's structure, activities and specifications as well as how to become a part of this development effort, please visit www.3gpp2.org or send an e-mail to secretariat@3gpp2.org.

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 2008/2009 participation in formulating positions and preparing international standards and reports for use by industry and government.

- 3M Communication Markets Division
- 4SE, Inc.
- AASKI Technology, Inc.
- ADC Telecommunications, Inc.
- ADTRAN
- ANDA Networks
- Advantech Satellite Networks
- Advent Instruments, Inc.
- Aero Solutions, LLC
- Aeroflex
- Agilent Technologies, Inc.
- Airvana, Inc.
- Alcatel-Lucent
- Allied Telephone and Data Corp.
- ALLTEL Communications, Inc.
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- American Tower Corporation
- Anagran, Inc.
- Analog Devices, Inc.
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- Datron World Comm. Division
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- Dietrich Lockard Group, Inc.
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- EADS Public Safety Inc.
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- Emtelle US Inc.
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- Erico, Inc. Caddy Fastener Div.
- Ericsson, Inc.
- Etherstack
- ETI Connect
- EXFO E.O. Engineering, Inc.
- Experior Photonics, inc.
- FAL Associates
- FBI
- FiberSource Inc.
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- Fluke Networks
- Flykees
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- Furukawa Industrial S.A.
- FWT, Inc.
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- Genesis Cable Systems
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- Hitachi Cable, Ltd.
- Hitachi Telecom (USA) Inc.
- Homaco
- Huawei Technologies USA
- Hubbell Premise Wiring

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- ICC
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- Ideal Industries, Inc.
- IHS
- Industrial Engineering & Testing
- Industry Canada
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- Intellon
- Intertek Testing Services
- Intrado
- IP Fabrics
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- KITCO Fiber Optics
- Kyocera Sanyo Telecom, Inc.
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- M/A-Com, Inc.
- Malouf Engineering International
- MC Communications
- Megger
- MLD Engineering Solutions, Inc.
- Molex Inc.
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- Movius Interactive Corporation
- National Communications System
- National Technical Systems (NTS)
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- Newport Media Inc.
- Nexans Intelligent Enterprise Solutions
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- Nokia Inc.
- Nokia Siemens Networks
- Nortel Networks
- Northwest Information Services
- Noyes Fiber Systems
- NTIA
- ODVA Open Devicenet Vendor Association, Inc.
- OFS
- Oregon State Police/SAFECOM
- Ortronics, Inc.
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- Panasonic Computer Solutions Company
- Panasonic Service & Technology Co.
- Panduit Corporation
- Paul J. Ford and Company
- Phoenix Contact
- Photon Kinetics, Inc.
- Plantronics
- Power Line Systems, Inc.
- PPC
- Quabbin Wire & Cable Co., Inc.
- Qualcomm, Inc.
- Radian Communications Services, Rohn Products
- RELM Wireless Corp.
- Research In Motion Corporation
- RISA Technologies
- RIT Technologies Inc.
- Rogers Wireless
- RTKL Associates Inc.
- Sabre Towers & Poles
- Samsung Electronics
- Samsung Telecom. America
- Sharp Laboratories of America
- Shively Labs
- Sigma Delta Communications, Inc.
- Sioux Falls Tower Specialists
- SMP Data Communications Inc.
- Soapstone Networks
- SOC America, Inc.
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- Sony Wireless Tech Division
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- Tower Technology
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- Ygomi LLC
- Zetron, Inc.
- ZTE USA Inc.

HEADQUARTERS
2500 Wilson Boulevard
Suite 300
Arlington, VA 22201-3834
+1.703.907.7700
+1.703.907.7727 (fax)

GOVERNMENT AFFAIRS
10 G Street, NE
Suite 550
Washington, DC 20002-4213
+1.202.346.3240
+1.202.346.3241 (fax)

tiaonline.org