INTERRUPTERS & CONNECTORS

INDUSTRY SPOTLIGHT

Industrial interrupters
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TECHNOLOGY FOCUS

AV connectors
Wires in a wireless world

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IEC WORLD

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CONFORMITY ASSESSMENT

A safer world
IECEE, IECEx and IECQ help make the world a better place
Interrupters & Connectors

The focus of this month is on interrupters, which can be found everywhere, in many devices and installations in the home and industrial environments, and on AV connectors which, in spite of the growing popularity of wireless connections, are still essential to provide top quality sound and pictures to all devices. This issue also looks back over some of the previous year’s events and highlights in terms of technical developments, TC activities and strategic meetings.
Editorial

The importance of your work and of the IEC is increasing

IEC International Standards facilitate innovation and enable the creation of ever safer products, which are implemented and used anywhere in the world. They contribute efficiently to the growth of existing markets and the development of new industries.

Rapid technology advancement and a growing trend to globalization require that we work increasingly faster. When I came on board, standards took on average nearly 40 months for completion, today the average is 31 months, with many of them being produced a lot faster than that. But for some industries this turn-around time is still too long and we continuously need to improve.

Our approach to standards development is tried and tested. It makes a lot of sense because it provides equal opportunity to small and big countries and through them to small and big businesses. No other system does. Our standards and conformity assessment environment is by definition borderless and geared to real industry needs.

We produce world class work, but even if it is not the engineer’s way, we need to become better in tooting our own horn. Today more than ever.

I had the pleasure of meeting many of you personally and would like to thank you for working with the IEC and with me over the last 17 years. I hope to see you in Oslo, where I will be handing over the reins to Frans Vreeswijk. Please provide him with the same support you gave me.

All my best wishes
Making the right connections
Room for many solutions to many messages

Multimedia content and computer data can be accessed through a variety of channels. In recent years the wireless distribution and reception of audio, video signals and other kinds of data have undergone remarkable developments. However, cables and connectors still remain an essential link of the entire production, transmission and reception chain. Several IEC TCs (Technical Committees) and their SCs (Subcommittees) prepare International Standards for these.

Cables standing their ground
The spectacular expansion of the number of connected devices, in particular portable ones such as mobile phones or tablet computers, has been made possible by improvements in wireless communication.

In most consumers’ homes, wireless connectivity has become the predominant networking technology for computer and multimedia devices. However, new high-efficiency coding technologies allowing the transmission of higher volumes of data over copper wires and the expansion of fibre optic-based systems have ensured that wired solutions continue to stand their ground.

Higher up the chain, at the production and transmission levels, cables and connectors are still essential, even when signals and content are disseminated via electromagnetic wave propagation or using satellite technology.

Perfect sound
In audiovisual or computer equipment the most commonplace applications for cables are in carrying sound, image or data from an analogue or digital receiving or processing unit to other components, loudspeakers, a display or any other terminal.

As many technologies are in use, as signal production has gradually shifted from analogue to digital sources and as use of metal wires and cables has given way to optical fibre-based systems, International Standards are essential to ensure that equipment from different manufacturers can be interconnected and work seamlessly with the right interfaces and connectors. Several IEC TCs and SCs prepare these International Standards to guarantee that this is what actually happens.

In the beginning there was copper…
RF or r.f. (radio frequency) signals, used to carry multimedia, voice or, more recently, data content, have long relied on copper cables, essentially coaxial cables, as distribution channels.

A coaxial cable is an electric cable that acts as a waveguide for RF signals. It consists of an inner conductor (single solid or stranded wires), surrounded by a dielectric (non-conducting) insulator that separates it from an outer metallic conductor made up of metal tubing or braided strands. These elements are contained within an outer sheath that protects them from the environment; they are all aligned along the same axis, hence the term coaxial.

IEC TC 46 prepares International Standards for cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories.

…then came light
For many applications, coaxial cables and copper wires have been replaced by optical fibres for the transmission of RF, voice and data signals and multimedia content. Optical fibre-based systems present many benefits as they allow large amounts of data to be transmitted over long distances almost instantaneously. Optical fibres are made up of a transparent core surrounded by a transparent but less refractive material that keeps light in the core, allowing it to act as a waveguide.
Electrical signals such as RF signals are changed into optical signals using an electrical to optical fibre converter. They are then transmitted down optical fibres. If required, repeaters are used to regenerate the signal over distance.

Hundreds of fibres can be bundled in a single cable, allowing large amounts of data to be transmitted simultaneously at great speed. This makes fibre an ideal medium for multimedia, telecommunication and ICT (Information and Communication Technology) applications.

Optical fibres are highly adaptable: they can be fitted nearly anywhere indoors or outdoors. They may be laid in ducts, sewer networks, water pipes, high-pressure gas pipes, along or inside power cables. They can be buried in the ground, in the pavement, used in self-supporting cables or submerged in the sea...

The fibre optic market is expanding rapidly. IEC TC 86 and its SCs prepare International Standards for fibre optic-based systems. SC 86B, in particular, deals with “fibre optic interconnecting devices and passive components”.

Multimedia world

One sector that relies extensively on both coaxial and fibre optic-based systems is the broadcast and entertainment industry. Everything from content production to signal distribution may be carried via satellite, terrestrial broadcast or cable networks.

The dramatic rise in the number of TV channels has driven the need for increased transmission capacity. The number of national channels in Europe had swollen from 47 in 1990 to 9 800 by 2010, a trend also observed elsewhere in the world. The introduction of interactive and data services, of HDTV (high-definition television) and of 3D TV has further increased the search for even higher capacity.

The signal distribution infrastructure in satellite ground stations and CATV (cable TV) head-ends still relies heavily on coaxial cables. HFC (hybrid fibre-coaxial) networks, employing a combination of optical fibre and coaxial cable, have been widely deployed for broadband networks by CATV operators since the early 1990s. In HFC networks, the initial distribution is ensured by optical signals. These are converted by fibre optic nodes into electrical signals which reach the end users’ equipment via coaxial cables.

Converging formats and physical interfaces

Computer and multimedia systems have been able to exchange content and use the same distribution channels following their convergence when the broadcasting and entertainment industry migrated from analogue to digital formats. Computer networks then started distributing multimedia content.

Nowadays both worlds use the same interfaces. Computers hook up to and power peripherals using USB (Universal Serial Bus) connections and send digital content to displays or TV sets via HDMI (High-Definition Multimedia Interface). In turn, TV sets link up to DVD players, set-top boxes or satellite receivers, also using USB or HDMI connections.

A single HDMI cable combines video and multichannel audio. If analogue leads were used, provision of the same connection would require three component video cables, plus six audio cables... (see article on HDMI in e-tech, January 2012).

USB ports replace serial, parallel, PS/2 and other interfaces, allowing different computer peripherals and electronic devices to be conjoined using the same cables and connectors.

The IEC has just endorsed four USB-IF (Implementers Forum) specifications. USB-IF specifications are recognized around the world as the de facto USB standards (see article on IEC endorsement of USB-IF specifications in this e-tech).

Wireless in; cables and connectors not out

In spite of its spectacular and recent expansion, the wireless distribution of content has not replaced cables in the computing and multimedia environments, and is unlikely to do so in the near future.

New and constantly evolving connections and interfaces have given a new lease of life to cabled connections. The work of many IEC TCs and SCs to improve existing standards and to incorporate industry specifications like USB and HDMI into their International Standards will ensure continuing extensive usage of cabled connections in multimedia and computer equipment.
Connectors and interfaces are central to computer and multimedia devices, allowing them to communicate and exchange all forms of data and content. With a total installed base now in excess of 10 billion units, the USB (Universal Serial Bus) is by far and away the most successful interface. The USB-IF (USB Implementers Forum), the support organization and forum for the advancement and adoption of USB technology, facilitates the development of high-quality, compatible devices and promotes the benefits of USB and other products that have passed compliance testing. The IEC has just endorsed four of its specifications.

For professional and consumer devices alike

Journalist Anli Serfontein remembers being on the road two decades ago when the plethora of cables and connectors required to attach her laptop to the chargers, printers, cameras, recording and other devices she needed fought for space on her computer. “These days,” she says, “there is little doubt that USB is the most successful personal computer interface.” “I work with laptops, using both Microsoft and Apple operating systems, and I can connect seamlessly my mouse, printer, chargers, cameras, detachable hard drives and other devices to both computers using the USB 2.0 interface,” says Serfontein.

First introduced in the mid-1990s, the USB interface is now present in almost all professional and consumer computer and multimedia devices, such as TV sets, set-top boxes, mobile phones and portable entertainment systems. It has evolved and continues to do so, with higher transfer rates, new connectors and the ability to attach an increasing range of different devices.

**IEC endorses USB**

The IEC and US-based USB-IF have announced IEC’s endorsement of four USB-IF specifications to facilitate global standards and interoperability for data transfer and charging.

These are the Hi-Speed USB (USB 2.0) specification, USB Cables and Connectors specification 2.0, USB Battery Charging specification 1.2, and Micro-USB Cables and Connectors specification 1.01, which are used by billions of electronic devices.

IEC TC (Technical Committee) 100 prepares International Standards in the field of audio, video and multimedia systems and equipment. Its TA (Technical Area) 14 prepares International Standards for the interfaces and measurement methods that relate to personal computing systems, equipment and other multimedia products.

**IEC recognition will help trade, WTO rules**

Recognition by the IEC is important for manufacturers and users, says USB-IF President and Chief Operating Officer, Jeff Ravencraft. “Worldwide recognition from the IEC helps further advance USB-IF’s world-wide position in data transfer and charging. In addition to current joint efforts, IEC and USB-IF will continue to collaborate to promote the adoption of USB specifications within the IEC,” he told e-tech.

Shuichi Matsumura, Technical Area Manager of TA 14 and senior expert in the Standards Strategy Office of Fujitsu Limited’s Intellectual Property Unit, highlights the scope and importance of the TA’s work. “It is not only for PCs, but it includes many other multimedia products.” Matsumura told e-tech, adding, “Adoption of the standard is good because under WTO (World Trade Organization) rules, countries can’t put up barriers on IEC-endorsed products.”
Most WTO member states rely on IEC International Standards as the technical basis of their laws and regulations regarding electronic and electrical devices and systems.

**IEC TC 100 and USB-IF objectives**

Matsumura says there are many *de facto* standards in PC products. “From the IEC perspective, TA 14 tries to change the customers’ lifestyles and make them happy with PC standards. So it is good that people know about this protocol.”

He adds, “Today, so many products use the USB 2.0 interface. For instance, my PC at home, the laptop I purchased three years ago, has a USB 2.0 interface. I use a mouse, a Web camera and an external hard drive, so I use USB 2.0 interfaces every day”.

“IEC TC 100 standardization work has two major objectives,” notes Matsumura. “The first is to enrich people’s lives with entertainment provided by audio, video and multimedia in their homes and networked environments. The second is to contribute to society by pursuing energy efficiency and by addressing options for accessibility in the use of audio, video and multimedia equipment.”

As for USB-IF work, Ravencraft says: “it helps educate people about USB technology and promote it with the goal of facilitating the development of high-quality USB products through a logo licensing and compliance programme”. A product has to be certified to use the logo of the USB-IF, which is an international organization.

**Phenomenal interface and global success**

“The USB is the most successful interface in the history of personal computing,” says Ravencraft. “It has migrated virtually 100%, not only into PCs but into almost all consumer electronic devices. All consumers expect to be able to charge their device over USB. You can charge almost any device over USB. There are over 10 billion USB products in the installed base today. The industry is shipping in excess of three billion USB products every year, including 1 billion plus cell phones and more than 150 million USB flash drives. It is a phenomenal interface.”

“It is supported on every operating system, increasingly present in cars and embedded systems and in virtually every consumer electronic device that is manufactured today”, notes Ravencraft.

**Evolving standard**

Ever since USB was introduced in the mid-1990s its standards have evolved and continue to do so, particularly with regard to transfer rates. The latest iteration, USB 3.0 (SuperSpeed USB), will bring major improvements to USB, including a maximum data transfer rate 10 times that of USB 2.0.

“Last year the industry shipped just under 80 million SuperSpeed USB products. This year the industry at large is going to ship just under half a billion of these. Next year it jumps to just under a billion SuperSpeed USB products,” says Ravencraft, adding, “There isn’t any technology that puts out numbers like these, where you go from 77 million to a billion in two years. We are going to bring new features and enhance USB.”

The IEC endorsement opens up new opportunities for USB, as many organizations rely on IEC standards for procurement. It also extends the remit of IEC International Standards for a wide range of USB applications.

**Endorsement benefits industry and users**

Ravencraft says the endorsement of the USB 2.0 protocol “benefits manufacturers and consumers by broadening support and recognition of USB standards”. He cites USB products such as the micro-USB used for charging, which helps reduce mobile phone-related electronic waste.

“USB delivers effortless audio and video streaming, music and photos to your home office, car and anywhere in between,” says Ravencraft.

“Manufacturers and consumers worldwide benefit from USB standards.”

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No need for multiple interfaces, such as PS/2, serial and parallel ports, a USB cable will do!

SuperSpeed USB micro-B connector (Photo: USB-IF)
Omnipresent interrupters

Interrupters, small and large, can be found everywhere from homes to all industries. They are used for a wide range of applications and in switching devices from circuit breakers to switches and reclosers. They are essential to the protection of equipment such as transformers and, in the case of residual-current devices, for saving lives and protecting equipment by interrupting the electrical flow. Several IEC TCs (Technical Committees) and SCs (Subcommittees) prepare International Standards for various types of interrupters and for the devices that use them.

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Interrupters automatically disconnect the AC (current) power supply if an imbalance is detected between the live and neutral components of the current supply. This enables them to protect individuals and equipment by preventing electrocution or damage to appliances or other equipment. Unlike fuses that must be replaced after current is cut off, circuit breakers can be reset to resume operation after tripping.

One application of RCDs that is set to gain importance is their inclusion in charging installations for EVs (electric vehicles). IEC SC 23E: Circuit-breakers and similar equipment for household use, prepares International Standards for such devices, as well as for RCDs in other equipment.

Other types of interrupters are AFCIs (arc fault circuit interrupters) which are responsible for cutting arcing-faults in electrical circuits that could cause fires. AFCIs reduce the risk of fire beyond the scope of conventional fuses and circuit breakers.

While they are used in a range of switching devices such as large circuit breakers, interrupters are also ubiquitous in all industrial domains from power generation and distribution to transport and manufacturing. They ensure safe and reliable operation by protecting installations.

Interrupters play a major role in safeguarding power generation and distribution. They are used to protect distribution transformers from overloads and secondary faults and to switch them “on” or “off”. They can also be found in reclosers: circuit-breakers used on overhead distribution systems to detect and interrupt momentary faults and then to restore power automatically to the lines once faults are cleared.

Reclosers use oil, vacuum, or SF₆ (sulphur hexafluoride) gas interrupters. SC 17A prepares International Standards for “automatic reclosers and fault interrupters for alternating current systems up to 38 kV”.

From small to...

Interrupters disconnect a circuit whenever they detect a fault condition, such as an overload or a short circuit.

Interrupters are used in many applications; the most common, with which most people are familiar, is the RCD (residual-current device) also known as RCCB (residual-current circuit breaker). These devices have replaced fuses in many households. RCDs are safety devices that

Ground fault circuit interrupters (or RCD) help prevent electrocutions and fires.
Safety though vacuum
Power network operators rely overwhelmingly on vacuum interrupters for their switching devices. Vacuum interrupters are special switches made of one fixed contact and one mobile contact. Both are enclosed in a tight and highly evacuated vacuum ceramic chamber. Vacuum is the ideal choice as it has much higher dielectric strength (insulating property) than air.

The over-riding advantage of vacuum interrupters is that their properties remain constant throughout their entire life cycle, due to the hermetically sealed vacuum interrupter by means of which any external influence is eliminated. They also recover quicker than other types of interrupters in case of voltage surges: vacuum allows them to cool quicker than gas- or air-filled interrupters.

About 80% of power network operators implement vacuum switching technologies. In Germany, the market share of vacuum circuit-breakers is close to 100%, according to that country’s Siemens AG.

Multiple applications, multiple and diverse standards
Interrupters, which are essential to many a range of applications in the domestic and industrial environments, are included in countless devices and systems. As a result, International Standards for the various kinds of interrupters and equipment that use them are prepared by several IEC TCs.

TC 17: Switchgear and controlgear, and its SCs “prepare international standards regarding specifications for circuit-breakers, switches, contactors, (...) and any switchgear assemblies, with the exception of those for domestic and similar use”, which are covered by SC 23E.

SC 22H prepares International Standards for UPS (uninterruptible power systems). UPS are devices that protect from power spikes or provide emergency power when the power source (essentially from the mains) fails.

UPS use interrupters and are essential to shield systems from the consequences of power cuts or surges. They protect small equipment like computers, and communication gear, or larger and critical installations, such as hospitals, data or communication centres.

TC liaison and coordination ensure quality across domains
As the work of these TCs and SCs includes various interrupters and may overlap in certain domains, they maintain close liaison and coordinate continuously to ensure they prepare the best possible and most relevant International Standards.

Manufacturers of switchgear and interrupters frequently highlight the conformity of their circuit-breaker and interrupter products with IEC International Standards, such as the IEC 62271, High-voltage switchgear and controlgear series, to stress their quality and reliability.

Since interrupters are present in so many devices and deployed in practically all industrial domains, work by all these IEC TCs and SCs to improve their characteristics and performance is set to continue apace.
Secondary batteries, which can be recharged, unlike their primary counterparts, offer the greatest flexibility for many applications, whether mobile or stationary. They make up the fastest growing segment of the battery market and are rapidly evolving as new materials are introduced. This expansion is well supported by the work of IEC TC (Technical Committee) 21: Secondary cells and batteries.

Enjoying a second youth
Secondary or rechargeable batteries make up the lion’s share (over 80%) of the global battery market and are expected to represent a value of some USD 61 billion in 2015. They are not new: the best known and oldest types of rechargeable battery, of the lead-acid variety, date back to the 1860s. They are still widely used, mainly in the automotive industry, where they are known as SLI (starting, lighting, ignition) batteries. They account for about 20% of total battery sector revenue and about a third of the secondary battery market.

Lead-acid batteries are also used in forklifts for materials handling, in cleaning machines and in wheeled mobility applications including golf carts and wheelchairs. These batteries also hold a solid position in the stationary domain, where they are used for EES (Electric Energy Storage): balancing supply from renewable sources, providing backup power and meeting off-grid electric power needs in emergencies. They are unlikely to be replaced at any time in the near future in these domains as they are a well-tried and low-cost option.

Modern chemistries
More recent electrochemical systems are also used in the production of secondary batteries, in particular of the dry-cell type. The most common are NiCd (nickel cadmium), NiMH (nickel metal hydride), Li-ion (lithium ion) and Li-ion polymer.

Nickel based batteries, available in small form shapes, are used in applications such as power tools, electric toys, portable electronic devices and hybrid electric vehicles. These batteries make up around 5% of the battery market.

The most widespread recent rechargeable batteries are of the Li-ion type. They have been pulled by growing sales of EVs (electric vehicles) and e-bikes of various kinds and the rapid global expansion of personal mobile entertainment, communication and computing devices, including mobile phones, digital cameras, personal entertainment systems and portable computers. Li-ion is the battery of choice for electronic consumer products. Its share of the market is comparable to that of lead acid batteries but is growing faster.

TC 21 focuses predominantly on safety: risks created by electrochemical elements and electricity from high voltage and current, which can have potentially hazardous consequences.

Comprehensive TC work across many domains
IEC TC 21 was established in 1931 “to prepare product standards for all secondary cells and batteries, irrespective of type, chemistry or application. The requirements cover all aspects: safety installation principles, performance, dimensions, labelling. All electrochemical systems are considered”.

Its SC (Subcommittee) 21A was established in 1965 “to prepare product standards for all sealed and vented secondary cells and batteries containing alkaline or other non-acid electrolytes”.

With the development of EVs and the adoption of hybrid and plug-in hybrid Li-ion batteries, which are seen as one of the most promising types of secondary battery, the TC’s work naturally extends to International Standards for performance, reliability, abuse testing and dimensions for these batteries.

In the transportation domain, TC 21 has also prepared International Standards for aircraft batteries, which must meet specific and rigorous requirements in terms of their design, construction and performance.
With the expansion of the renewable energy sector, the need to store energy for balancing power generation and distribution during peak periods has led to additional demand for batteries.

TC 21 prepares International Standards for secondary cells and batteries for renewable energy storage (wind, photovoltaic, etc.) covering “In” and “Off” grid applications.

In addition, the TC has announced that it will “continue to monitor the rapid development of various new chemistries in the field of Li-ion batteries”.

**System approach**

TC 21 and SC 21A work closely with TC 35: Primary cells and batteries, as some standards apply across the committees’ respective areas of work.

Since secondary batteries are used in a number of sectors such as air, road, rail and sea transport, electronics systems, renewable energy and electrical energy storage, TC 21 and SC 21A maintain liaisons with many other IEC TCs. They include TC 9: Electrical equipment and systems for railways; TC 18: Electrical installations of ships and of mobile and fixed offshore units; TC 22: Power electronic systems and equipment; TC 69: Electric road vehicles and electric industrial trucks; TC 82: Solar photovoltaic energy systems; TC 88: Wind turbines; TC 108: Safety of electronic equipment within the field of audio/video, information technology and communication technology and TC 116: Safety of motor-operated electric tools. The TC also maintains liaisons with other organizations such as ISO (International Organization for Standardization), especially for electro-mobility applications.

**Market trends and objectives**

The expansion of the transport sector, in particular in terms of EVs, e-bikes, mobility scooters and buses, as well as of Electrical Energy Storage needs for the renewable energy sector, smart grid applications and the rapid growth of the portable devices market, points to the continued healthy development of the secondary battery sector, which is expected to grow by 68% between 2009 and 2015. To sustain that growth, IEC TC 21/SC 21A will ensure that equipment manufacturers using secondary batteries have safe and dependable products available, and will continue to prepare new and update existing International Standards in a burgeoning sector.
Disposable yet irreplaceable
Some fire left in primary batteries

Access to power whenever and wherever it is needed is essential. When connection to the grid is not available, or in other cases, it can only be ensured by batteries. The global share of primary batteries that can only be used once and have to be disposed of when they are discharged is diminishing as their rechargeable counterparts are gaining ground. In spite of this, they are still essential and irreplaceable in countless applications and systems. International Standards for these devices are prepared by IEC TC (Technical Committee) 35: Primary cells and batteries.

Suffering from competition from rechargeable... but not dead
The primary battery industry is significant, but “marked by relatively flat growth” according to TC 35. It made up 23.6% of the global battery market in 2009, although its share is forecast to drop to 17.4% by 2015. This does not reflect actual decline, but a growth of 14.9% in a market that is expected to expand by more than 64% over the period, according to business research and consulting firm Frost & Sullivan.

Primary batteries were instrumental in the expansion of portable electronic devices after transistors were invented. They allowed the development of portable radios and other devices later. They continue to meet significant needs and are still irreplaceable in devices that require a small current for a long time, like wristwatches, remote controls, electric keys, smoke detectors, fire alarms and medical implants, such as pacemakers for heart patients. They are also important when charging is impractical or impossible, for instance in military combat missions or rescue operations.

Primary advantages
Most primary batteries are of the dry cell type. They generally have a lower self-discharge rate and higher energy density than their rechargeable counterparts: a lithium battery made for film cameras and military equipment holds more than three times the energy of lithium-ion. Even household alkaline batteries provide 50% more energy than lithium-ion. Most primary batteries are inexpensive, readily available and are also generally environmentally-friendly. They are useful in equipment that is only needed in emergencies and must then work immediately even if it has been stored for an extended period.

The need for primary batteries will not disappear so work by IEC TC 35 to improve the devices’ performance remains very important.

TC work supports industry
TC 35 was established in 1950. Its remit is “to prepare international standards for primary cells and batteries, particularly those relating to...
Within this scope, TC 35 published the five-part 60086 series that covers physical and electrical specifications, performance tests and dimensions of primary batteries, as well as watch batteries, the safety of lithium batteries and the safety of batteries with an aqueous electrolyte.

These standards are essential for the battery sector and for manufacturers of battery-operated products and equipment. In order to fit such products, the dimensions of batteries, as well as their electrical specifications, have to be standardized. Standards also ensure that the batteries operate safely and reliably.

It should be noted that standards concerning the dimensions of many primary batteries apply to secondary batteries as well. For instance, the IEC R6 or R03 size batteries, which are also known as AA, AAA, penlight or micro, are available in the form of secondary batteries too.

The other main work of TC 35 concerns IEC 62281: Safety of primary and secondary lithium cells and batteries during transport, developed with SC (Subcommittee) 21A: Secondary cells and batteries containing alkaline or other non-acid electrolytes, within JMT (Joint Maintenance Team) 18.

New technologies and market trends open prospects
TC 35 notes that “the device market continues to require improved performance from portable power sources in increasingly smaller physical envelopes”. It adds: “the increasing and dominant application shares of the R6 and R03 batteries are continuing evidence of this trend”. The TC also notes that “market trends for primary batteries often follow trends in devices”.

With the dramatic expansion of mobile entertainment, home and industrial equipment observed in recent decades, the secondary battery market is absorbing the lion’s share of growth in the battery market, as most of these devices and appliances use rechargeable batteries.

New chemistries that include, for instance, the use of a small radioactive source, such as tritium in betavoltaic cells, open new prospects for primary batteries, in particular for nano applications that may require continuous nanowatt/microwatt power for 20 years or more.

Challenges and opportunities for the TC
Observing the technology and market trends, TC 35 aims to address the following challenges:

• The alignment of standards with transport regulations both of new and spent battery types
• The alignment of standards with sustainability initiatives worldwide
• The use of a proper methodology to develop information concerning the respective life cycles of primary and secondary batteries.

It also sees opportunities for primary batteries for essential safety applications, long shelf-life applications and low/high temperature applications.

A busy agenda for the foreseeable future
Although trends indicate relatively flat growth for primary batteries in coming years, the sector is likely to remain important for the foreseeable future. TC 35 showed its intention of playing a significant role in an overall dynamic global battery market when it not only listed the challenges it intended to address, but also stated its plans to “review significant global developments related to portable batteries, both primary and secondary chemistries (…) and to pay close attention to environmental/sustainability developments.”
Developing standards for safer navigation
IEC TC supports increased use of electronics for navigation and communication at sea

It's good to talk
Communication between ships and from ship to shore is essential for the safety of navigation as well as for the rescue of ships and crews in distress.

Communication with ships was actually the first application of radio at the end of the 19th century. Only gradually did it start to be used for distress and safety purposes. The most famous example is the wireless distress message sent from the Titanic on 15 April 1912 using Morse code.

Morse was phased out 15 years ago in favour of GMDSS (Global Maritime Distress and Safety System) a new system developed by the IMO. GMDSS uses radio and satellite communication and equipment that enables ships to communicate with shore stations from anywhere at sea and at any time. To this day, IEC TC 80 has prepared and published 11 standards covering all aspects and technologies of GMDSS.

In 1979 the IMO adopted the International Convention on Maritime SAR (search and rescue). GMDSS requirements form part of the IMO’s SOLAS (Safety of Life at Sea) Convention, making it an essential tool for SAR.

The IEC 61097 series of standards for GMDSS is based on IMO resolutions defining equipment performance standards for all components of the system. IMO is constantly reviewing these and adding new ones as more requirements are identified, particularly concerning security and piracy and increased interest in shipping traffic in Polar Regions, each of which aspects poses unique navigational and SAR concerns.

Keeping off the rocks
Mariners have always tried to chart their course to reach their destination safely, avoiding other ships, natural hazards such as reefs or treacherous currents and areas that present a danger for other reasons (piracy, conflict zones, disputed waterways, etc.). Electronic equipment in the form of radars and sonars was first introduced on naval

Safe navigation is vital for ships such as LNG or oil tankers (Arctic Princess – Photo: Statoil)
ships from the 1930s to provide data on distance to and from other ships and shores as well as on navigational depth.

In recent years, the navigation equipment carried by ships has seen significant improvements. Ships now carry and rely upon improved radar equipment and automatic position fixing provided by satellite navigation systems. This year also sees the start of a phased-in programme for the mandatory carriage of electronic charts in the form of an IMO system called ECDIS (Electronic Chart Display and Information System), a computer-based navigation information system that can be used instead of paper nautical charts and integrates information from satellites. The first edition of IEC standards for ECDIS was published in 1998; it is now on its third edition.

The IHO (International Hydrographic Organization), an intergovernmental organization representing the hydrographic community, recently updated its standard for electronic navigation charts and will complete work on the next generation of standards for electronic navigation chart databases in the next few years.

No navigation, no communication without IEC standards

In 1976, the organization known as Inmarsat (International Maritime Satellite Organization) was established to provide emergency maritime communications. A pioneering role was played by the IMO in its establishment.

TC 80 prepares and updates International Standards for Inmarsat, covering SES (ship earth station) and EGC (enhanced group call) equipment. The latter category is capable of receiving multiple-address messages and is designed for use in GMDSS and LRIT (long-range identification and tracking) applications. These constantly updated standards enhance and increase the capabilities of the Inmarsat element of GMDSS.

All maritime electronic navigation and communication equipment and systems like BNWAS (Bridge Navigational Watch Alarm System), ECDIS, AIS (Automatic Identification System) or GMDSS, which play such an important role in maritime safety, rely on the work of IEC TC 80 which has produced some 50 International Standards so far, and continues to work on new ones.

No power, no safe shipping

TC work covers all electrical installations in a demanding environment

Merchant ships are the lifeblood of the global economy, transporting around 90% of international trade (in terms of volume), as well as some two billion passengers a year. Continuous efforts are made to improve safety, which is dependent on equipment that relies entirely or to a great extent on electrical systems. Standards for electrical installations in ships and mobile and fixed offshore units are prepared by IEC TC (Technical Committee) 18 and its SC (subcommittee) 18A.

Learning by tragedy

April 2012 marked the 100th anniversary of the best known ship disaster: the loss of the Titanic and the deaths of over 1 500 of her passengers and crew. The shipwreck was the catalyst for the adoption, in 1914, of the first Safety of Life at Sea (SOLAS) Convention. The SOLAS convention, which forms a
central part of the IMO’s (International Maritime Organization) activity, applies to all commercial international seagoing ships of 500 GT (gross tonnes) and above.

Improving equipment through standardization has been instrumental towards raising safety levels in the maritime environment. Shipping was one of the first industries to adopt international safety standards that are now widely implemented.

The IMO, acknowledging the IEC’s expertise, established a formal relationship with it to collaborate in the field of electrical systems for ships. This work was entrusted to IEC TC 18: Electrical installations of ships and of mobile and fixed offshore units, whose origin dates back to 1927. At a meeting in 1986 the TC’s scope was extended to cover electrical installations on board fixed and mobile offshore oil and gas exploration units.

TC 18 prepares standards that chiefly concern factors promoting the safety of ships and of mobile and fixed offshore units and those promoting safety of life, in accordance with the SOLAS convention.

IEC SC 18A develops international standards for electric cables for ships and fixed offshore units.

Self-contained power generation and distribution

Electrical installations on ships and offshore units are indispensable for the operation of machinery, propulsion, navigation and communication equipment, as well as for the auxiliary systems that provide essential services such as lighting, running water, plumbing, refrigeration and food preparation.

Power on ships is supplied by generators mostly driven by the main engines and by auxiliary units.

TC 18 prepares standards to ensure all types of equipment and installations used on board ships and in mobile and fixed offshore installations are designed and built to operate safely and appropriately, a complex task as power and water do not mix.

Previously, the standards gave specific requirements for equipment such as switchboards, rotating electrical machines, transformers and galley (kitchen) equipment. Today, reference is, as far as possible, given to existing equipment standards issued by the TCs connected with relevant products, while only those additional or alternative features required for use in a ship or offshore environment are given in TC 18 standards.
A major project underway within TC 18 aims at reducing the number of standards and at updating others to reflect the fast-changing pace of current marine technology.

TC 18 standards cover all types of equipment and installations used on board ships and in mobile and fixed offshore installations.

IEC 60092, the current series of International Standards for electrical installations in ships, the first edition of which was published in 1957, is referenced in SOLAS.

Bigger, faster ships facing both old and new problems

The current types of ship will continue to exist but will do so in parallel with new, larger and more efficient container and passenger ships. However, in addition to new issues the newer ships still face age-old hazards.

One of these, fire, has always been a major threat to mariners: they have nowhere to escape to and no external aid is available. Today there is a growing understanding not only of the dangers of fire but also of the consequences of the spread of fire and of the risks associated with smoke. For these reasons, special attention is paid to characteristics such as flame retardation capability, fire resistance, smoke emission, toxicity, corrosivity and use of halogen-free materials for both electrical equipment and cables.

The increase in the size of vessels and of the installed electrical load is leading to the introduction of higher voltage systems for power consumers, propulsion and machinery auxiliaries.

The last category includes addressable fire alarm and low-level lighting systems, as well as passenger and crew address systems. Proper operation of on-board computer equipment may be affected by electromagnetic interference resulting from the higher voltage systems being introduced in ships.

**Clean up your act**

There is general consensus that international shipping needs to become cleaner.

Cutting emissions of SOx (sulphur oxide), NOx (nitrogen oxide) and particulate matter (PM) produced by ships’ generators in ports has become a priority worldwide and has led to the introduction of HVSC (High Voltage Shore Connection) systems. These allow ships to shut down their diesel engines and connect to a land-based grid while they are docked.

TC 18 issued a PAS (publicly available specification) for HVSC systems in 2009, giving requirements for such systems. This PAS was further developed into an International Standard prepared in cooperation with ISO (International Organization for Standardization) and IEEE (Institute of Electrical and Electronics Engineers). IEC/ISO/IEEE 80005-1, *Utility connections in port – Part 1: High Voltage Shore Connection (HVSC) Systems – General requirements*, was published in July 2012 (see article in this issue).

Electric propulsion offers further prospects for cleaner shipping. In addition to operational solutions such as slow steaming, which can cut fuel consumption and emissions by up to 40%, and design and engineering approaches such as improved hull shape, more efficient engines and even the type of paint used on hulls, the industry is also experiencing a shift towards electric and hybrid propulsion systems. This started in the cruise ship industry and has been made possible primarily due to the development of power electronics.

Hybrid solutions use a combination of diesel engines or gas turbines, generators, batteries and motors to drive the propulsion system; they will require improved and modified standards. A move to variable speed auxiliary drives is also being seen for the same reasons. The standard for electrical propulsion is now being updated and a revised standard is expected in 2013.

The application of fuel cells to marine propulsion is being studied by shipbuilding and marine engine manufacturers. The technology’s viability is already being tested on a 5 900 metric tonne Norwegian offshore supply ship.

**Global cooperation relying on IEC standards**

Shipping and offshore exploration are such complex and international industries, implementing practices and a variety of systems developed over decades, even centuries, that they involve many national and international bodies and organizations.

IEC standards for electrical installations for ships and mobile and fixed offshore units are implemented worldwide by naval architects, marine engineering design and consulting companies, and all industries involved in the shipbuilding and related sectors.

Rather than opting to develop their own standards, most of the industry’s bureaus or registers of shipping, such as the ABS (American Bureau of Shipping), Bureau Veritas, DNV (Det Norske Veritas), Lloyd’s Register, the Korean Register of Shipping and the Russian Maritime Register of Shipping, rely on IEC International Standards as their preferred choice.
Heat without fire for manufacturing
Heady times for TC 27 experts

Electroheating, the high-power heating of various materials using electrical energy, is used to make countless products we use, consume or even eat. Steel or aluminium ingots, ceramics and ready-made meals may be produced using this process. IEC TC (Technical Committee) 27: Industrial electroheating and electromagnetic processing, prepares International Standards for the many installations used in the sector.

Standardization is newer than technology
Electroheating was first introduced to the steel industry in the form of electric arc furnaces in the early 20th century. An electric arc is a plasma discharge that forms when a high electric current passes between two electrically conducting materials or “electrodes” through a normally nonconductive medium such as air. In industry, this process is used for smelting and refining, welding metals, plasma cutting and many other applications.

A number of other electroheating technologies, such as infrared radiation, induction, radio frequency and microwave, have emerged since electric arc furnaces were first installed. Electroheating is applied in generic industrial operations such as fluid heating, calcination, drying, evaporation, sterilization, heat treatment, metal and non-metal heating, melting, smelting/agglomeration, curing and forming.

Multiple applications
Such technologies are used for producing or processing many different materials, which range from metals to glass and from natural fibres to polymers. They are also used to prepare paper and foodstuffs.

TC 27 was established in 1937 “to prepare international standards for characteristics, safety requirements and test methods for industrial electroheating installations”. Its standardization work actually began in the 1960s. Its first standards, including IEC 60239, which dealt with dimensions of graphite electrodes for arc furnaces, were published in 1967.

The scope of TC 27 covers all aspects of industrial electroheating, including electroheat-based surface treatment technologies, and combinations of technologies.

Broad customer base, far-reaching remit
Electroheating equipment encompasses a wide variety of heating methods. Users of TC 27 standards are to be found in a range of heavy to light industrial sectors, reflecting the wide variety of electroheating applications. They include the iron, steel and non-ferrous metal industries; the automotive and machinery industries and the cement, glass, ceramics and chemical industries, as well as the food industry.
Emerging sectors such as nanotechnology, biotechnology, optoelectronics, the PV (photovoltaic) industry and the re-processing of waste and dangerous products require precise or unique heating methods. They also open up new perspectives for electroheating processes and present the need for new or updated standards. New heating processes that use, for instance, laser or microwave heating, may sometimes provide the only possible solution to meet the requirements of a number of disparate industries.

Nevertheless, standardization in industrial electroheating is of great importance for manufacturers of equipment and installations. These are mainly small and medium-sized enterprises and their products are often individually-designed and custom-engineered according to the specific needs of end-users. Establishing common International Standards for equipment with different characteristics and safety requirements may be difficult, but fully supports the trends towards global harmonization and the reduction of trade barriers.

Specific issues
Electroheating installations that use electromagnetic processing may prove to be sources of EMI (electromagnetic interference), leading the TC to address specific aspects of EMC (electromagnetic compatibility) and EMF (electromagnetic fields).

As electroheating technologies extend to more sectors and represent an increasingly large percentage of industrial electricity consumption, EEE (electrical energy efficiency) becomes a pressing issue.

To tackle the energy efficiency issue, TC 27 set up WG 29: Energy efficiency in electroheating installations, to “develop guidelines for determination of criteria (…) for allowing fair comparisons and evaluations of the performance and efficiency within particular sub-categories of electroheating equipment / installations”.

TC 27 also established WG 30: Industrial infra-red electroheating installations, “to develop standards concerning safety and test methods for industrial infrared electroheating installations”.

**Multiple objectives**
Noting an “increasing demand for energy savings, product quality and environmental protection” and that “application areas of electroheating methods are not only expanding but also becoming a must for many industrial sectors”, TC 27 lists as its objectives and priorities for the next 3-5 years:

- revision of the 12 publications in the IEC 60519 series of standard that deal with the safety of industrial electroheating installations
- preparation of additional parts covering particular industrial electroheating installations, such as those with infrared emitters or laser heating equipment
- revision of the large series of test standards, which should be updated in view of technological developments and market needs.

In addition to its revision work, TC 27 also intends to start work on new standards, while amending the existing publications, to address:

- EEE issues (guidelines for the classification of equipment/installation to determine the performance/efficiency of a given system and a comparison with other systems of that class)
- EMC and EMF issues
- safety and test methods for different electroheating installations, in particular new ones or those not covered by existing standards
- safety and reliability aspects of combining heavy current electroheating equipment with sophisticated digital control methods

To take into account the predicted long-term evolution of electroheating technologies, TC 27 announces its intention to undertake new projects aimed at developing safety and test standards for infrared heating technologies, plasma arc furnace installations, new casting systems and electromagnetic processing of materials.

The development of current electroheating processes, coupled with the emergence of new technologies and considered in conjunction with IEC TC 27’s objectives, point to the likelihood of an extremely busy agenda for this TC in coming years.
Small but powerful
Micro electromechanical systems are the current big thing

MEMS (Micro electromechanical systems), were invented in the 1980s and have been used for years by the car, computer and medical industries as well as for industrial applications. Now, thanks to falling cost and size, they are also being incorporated in consumer electronics.

Present in a multitude of industries
MEMS are effectively microscopic machines that vary in size from under one micron to several millimetres. They generally contain an electrical component that processes data and a mechanical one that acts in response to that data.

Today, MEMS can incorporate functions such as gyroscopes, pressure and motion sensors, accelerometers and altimeters making them indispensable for consumer electronics ranging from remote controls and smartphones to pico-projectors and printers.

They are also transforming mass data storage, by providing ever tinier solutions for disk drives and servers. In the car industry MEMS accelerometers are increasing the reliability, and safety, of airbag systems. In the medical sector their preciseness and size allows them to be used as chips inserted under patients’ skin and built into scalpels for use during operations. The list of applications seems endless.

Ensuring MEMS are well-designed and safe
IEC SC (Subcommittee) 47E: Discrete semiconductor devices, and SC 47F: Micro-electromechanical systems, prepare International Standards that facilitate the design and manufacture of sensors and MEMS. The testing methods they devise allow manufacturers to build reliable and safe micro electromechanical systems that can be used worldwide.
Reaching out globally

IECEE is an internationally trusted partner

The last 12 months have been extremely successful and fruitful for IECEE, the IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components. Increased collaboration with international organizations, outreach to developing countries and the introduction of new services and product categories have contributed greatly to confirming IECEE as the leading global certification system for electrical and electronic products.

IECEE certification essential to IT sector
It is largely agreed that conformity assessment is a key factor in facilitating free trade and economic development. IECEE Executive Secretary Pierre de Ruvo was invited by the WTO (World Trade Organization) to make a presentation at a symposium marking the 15th anniversary of the WTO ITA (Information Technology Agreement). His speech was part of the programme module on “Challenges and possible solutions to expanding trade in ICT products”.

The audience was particularly interested to learn why and how IECEE ensures that safe and efficient products reach markets and helps reduce and, ultimately, eliminate obstacles to trade. This is essential in the WTO ITA context since the IECEE product categories that cover IT equipment are among those that issue the greatest number of certificates each year, guaranteeing safety and efficient use for all certified products.

New development and the recent inclusion of additional services – such as energy efficiency – in the IECEE portfolio, contribute to the positioning of the IECEE System as a key player in furthering the success of the WTO ITA (see article in e-tech, June 2012).

Representing IEC and IECEE internationally
De Ruvo represented the IEC and IECEE at a significant number of conferences, workshops and meetings arranged by international organizations such as UNIDO (United Nations Industrial Development Organization), ASEAN (Association of Southeast Asian Nations) and APEC (Asia-Pacific Economic Cooperation). The list is by no means exhaustive but shows that IECEE is a respected and important player on the international scene.

In February 2012, he attended a UNIDO workshop in Dhaka, Bangladesh, which brought together policymakers and regulators, industrialists, academics, laboratory professionals and accreditation officials from several Asian countries (see article in e-tech, March 2012).

In March, he took part in the 38th ASEAN ACCSQ (ASEAN Consultative Committee on Standards and Quality) meeting in Bandar Seri Begawan, Brunei Darussalam (see article in e-tech, May 2012).

IECEE also gave de Ruvo the opportunity to participate in an APEC workshop in Sydney, Australia, pertaining to “Risk assessment in household appliances”.

These events enabled him to introduce the new IECEE Affiliate Status, with its focus on CA (Conformity Assessment) for developing countries, and to describe how Affiliates can use and benefit from the IECEE System.

Involving developing countries
To help developing countries that have an interest in participating in CA activities, IECEE decided to grant IEC Affiliate Countries observer status in the IECEE System. This status offers them a form of participation in CA activities without incurring the financial burden of actual membership, allowing them...
to make full use of the IECEE 100% electronic environment.

The Affiliate Countries participating in IECEE activities are entitled to attend all IECEE meetings as observers, make use of the IECEE rules, procedures and operational documents and participate in the various IECEE training and workshops. However, observers do not have the right to propose or vote on resolutions (see article in e-tech, April 2012).

More services and product categories
IECEE has recently developed, and is still developing, new services to respond to demand from industry. A new product category, ELVH, has been developed for electric vehicles.

The recently set-up IECEE E3 (electrical energy efficiency) programme ensures that products comply with IEC International Standards in terms of performance, energy consumption and noise level emissions.

Factory surveillance service
This service can be used as a stand-alone proof of compliance of the factory where the product is manufactured and/ or assembled or as part of the IECEE CB-FCS (Full Certification Scheme). The IECEE CB-FCS goes beyond product testing. It covers Type Testing and regular surveillance at the factory that manufactures the relevant certified product. This is of value to manufacturers who need to provide proof that products manufactured in a given factory offer a consistent level of quality over time.

Global motor labelling programme in the pipeline
Leading manufacturers of industrial motors around the world have already adopted an energy efficiency classification that was put in place by the IEC and published as a globally relevant IEC International Standard. Now the IECEE is working with NEMA (National Electrical Manufacturers Association) and its motors’ industry on the development of a truly global labelling programme for all types and sizes of industrial motors. This programme will be designed to ensure that highly energy-efficient motors meet the needs and applications of users and OEMs (original equipment manufacturers) based on a consensus definition of “premium efficiency” and use of an IECEE E3 logo for premium products (see article in e-tech, July 2012)

Other services such as Industrial automation and automation devices and Smart Grid – with focus on the smart home, the smart building and the smart factory – are currently in development.
Global and mobile
Growth and success for IECEx

IECEx, the IEC System for Certification to Standards relating to Equipment for Use in Explosive Atmospheres, has had yet another very good year. An increase in the number of certificates issued by all its Schemes, participation in events at international, regional and national levels, new market openings, and the introduction of an IECEx application for mobile devices are all elements that have contributed to the growing success of the System.

The recent 2012 annual series of IECEx meetings held in Calgary, Canada, and hosted by QPS, was also a milestone for the System, with the highest ever number of registered delegates in attendance.

Demand for CoPC is high
All three Schemes – Certified Equipment Scheme, Certified Service Facilities Scheme and CoPC (Certification of Personnel Competence) Scheme – have reported increases in the number of certificates issued. The most impressive growth comes from the CoPC which in 2012 is expected to issue at least double the number of certificates that it issued in 2011. The long-running IECEx Certified Equipment Scheme (the first and original scheme of the IECEx) still continues to see impressive annual growth.

IECEx has recently set up the ExPCC (IECEx Personnel Certification Committee) to oversee the operation of the CoPC Scheme and meet the demands of the Ex industry sector. The new committee, under the leadership of Ralph Wigg (Australia), as Chairman and John Allen (UK), as Deputy Chairman, with experts across all stakeholder groups, met for the first time in Paris, France, in June.

International presence and influence
For many years, IECEx Officers and experts have been promoting the System internationally, participating in conferences, seminars and workshops and making targeted presentations to the Ex industry sector. In 2012 IECEx was present at a greater number of events than ever before.

Launch of IECEx in the Gulf
The first ever IECEx International Conference on Equipment and Services in Explosive Atmospheres was held in Dubai, UAE (United Arab Emirates) in March, marking the launch of the IECEx in the Gulf. The conference was organized by ESMA (Emirates Authority for Standardization and Metrology) in collaboration with IECEx and UNECE (United Nations Economic Commission for Europe).

The purpose of the event was twofold: to bring together world experts in the many industry sectors that deal with Ex Equipment, installation, servicing and competence of personnel; and to introduce the Gulf Region to the increasingly successful international schemes run by IECEx. It was a great success on both counts (see articles in e-tech, April and May 2012).

Joining forces
IECEx Chairman Kerry McManama and Marty Cole, an expert from IEC TC (Technical Committee) 31: Equipment in explosive atmospheres, wrote and presented a joint paper on IECEx Personnel Certification at the PCIC (Petroleum and Chemical Industry Committee) North America Conference.

Chris Agius and Lorenza Jachia, who is Head of Unit, Regulatory Cooperation, UNECE, also co-authored a joint paper, entitled IECEx System – Evolution and role of the United Nations, UNECE. This provided an in-depth analysis of the IECEx System and the rationale behind its endorsement by the United Nations, via UNECE, as the internationally recognized certification system for promoting the safety of equipment, services and personnel associated with explosive areas (see article in e-tech, June 2012).
This paper was presented at the PCIC Europe conference in June. A presentation at the PCIC Middle East conference is also planned for November.

**HazardEx Award**
Three IECEx Officers made presentations at the 2012 HazardEx Conference, which took place in Harrogate, UK in February. During the conference, IECEx Executive Secretary Chris Agius received the HazardEx Lifetime Contribution to the Industry Award. It was only the third such Award ever bestowed by HazardEx. The two previous recipients were Chris Towle of MTL (Measurement Technology Ltd.) and Ron Sinclair MBE, of Baseefa. Both have been members of IEC TC 31: for many years and Sinclair is also a member of the IECEx Management Committee (see article in e-tech, March 2012).

**Reaching out to industry...**
The IECEx Secretariat, together with IEC-APRC (Asia-Pacific Regional Centre), organized a series of industry presentations in four Asian countries, namely Vietnam, Malaysia, Indonesia and Singapore, to raise awareness of and to promote the IECEx System and its Schemes to local and regional industry representatives. Throughout the year, IECEx Officers and experts promoted the System in many local and regional events.

...and to the IEC community
Reaching out to developing countries is very important to IECEx. Ex environments are not limited to the oil and gas industries. A wide range of activities can be potentially hazardous: grain handling and storage, mills, mines, petrol stations, aircraft refuelling, to name but a few.

IECEx speakers will make presentations at the IEC Affiliate Forum held during the IEC General Meeting in Oslo, Norway. Later in the year, a joint IECEx-AFSEC (African Electrotechnical Standardization Commission) seminar is planned in Abidjan, Côte d’Ivoire (see article in this issue).

IECEx is a major supporter of the IEC (YP) Young Professionals Programme and has been an active participant in each of the annual YP workshops and was proud to welcome one of the Young Professionals at its recent 2012 annual meetings in Calgary. IECEx will also participate in the 2012 IEC Young Professionals workshop in Oslo.

**Going mobile**
In response to requests from IECEx System users to be able to access to IECEx Certificates easily, especially when working in the field, the IEC and IECEx will be launching the IECEx mobile application. This is a first for both parties.

The application, for iOS and Android tablets and smart phones, will offer both online and offline modes for accessing IECEx Certificates. The offline mode is an important feature, particularly for people working in explosive atmospheres. Search criteria will be similar to those available on the IECEx website, i.e. offering the ability to search by certificate number, applicant, IEC International Standard, type of protection, certification body and apparatus.

For more information on the IECEx System and its Schemes, visit: www.iecex.com
IECEx (IEC System for Certification to Standards relating to Equipment for Use in Explosive Atmospheres) and AFSEC (African Electrotechnical Standardization Commission) are planning an international seminar that will take place in Abidjan, Côte d’Ivoire, on 28-30 November 2012. The event is organized in collaboration with several African organizations: AFREC (African Energy Commission of the African Union), UPDEA (Union of Producers, Transporters and Distributors of Electric Power in Africa), and CODINORM (the Côte d’Ivoire national standardization body) and in partnership with two Ivoirian electrical utilities: CIE (Compagnie Ivoirienne d’électricité) and CIPREL (Compagnie Ivoirienne de production d’électricité).

Safety in Ex environments is a must
Observation of safe practices in hazardous areas is non-negotiable. When equipment is not installed, maintained, inspected or repaired by competent persons and according to strict Ex standards, the results can be devastating. What may be acceptable in non-explosive atmospheres can, in a different environment, lead directly to explosions that not only destroy property but can cost human lives or cause severe injuries.

More than oil and gas
The Ex sector encompasses more than just the most obvious oil and gas or petrochemical industries. The risk of fire or explosion exists in a variety of sectors, such as transportation – including aerospace – furniture manufacturing, automotive manufacturing and repair, pharmaceuticals, food processing, grain handling and storage, sugar refineries and coal mining.

Who should attend?
The event is for experts, senior staff and professionals from the electrical, oil and gas industry sectors in African countries who are involved in the standardization, manufacture, inspection, repair, exploitation, maintenance and overhaul of equipment as well as system evaluation and certification of personnel competence.

The seminar will provide a unique opportunity to learn about IECEx and the benefits of using the System.

A practical approach
The seminar agenda focuses on capacity building for African experts in the Ex sector and will include technical presentations and practical exercises.

Participants will learn to apply five IEC International Standards (see list below) that relate to the certification of electrical equipment and services in explosive atmospheres, as well as how to draft an evaluation report.

The technical presentations will deal with the daily problems participants face when using equipment in explosive atmospheres. They include issues around area classification, equipment installation and systems, inspection, repair and overhaul as well as evaluation of personnel skills. Practical exercises will take place at the CIE and CIPREL facilities and will include site audits.

Networking opportunity
The seminar will be conducted by two IECEx experts, Peter Thurnherr and Thierry Houeix, who will share their experience and knowledge, answer questions and provide advice, information and background material.

The seminar is a great opportunity for African professionals to make contacts, network and learn from IEC experience in the entire global Ex field.
The seminar will focus on the following IEC International Standards:

- IEC 60079-10-1, Explosive atmospheres - Part 10-1: Classification of areas - Explosive gas atmospheres
- IEC 60079-10-2, Explosive atmospheres - Part 10-2: Classification of areas - Combustible dust atmospheres
- IEC 60079-14, Explosive atmospheres - Part 14: Electrical installations design, selection and erection
- IEC 60079-17, Explosive atmospheres - Part 17: Electrical installations inspection and maintenance
- IEC 60079-19, Explosive atmospheres - Part 19: Equipment repair, overhaul and reclamation

IEC International Standards for explosive atmospheres

About the speakers

Thierry Houeix
Thierry Houeix is a Certification Officer at INERIS, the French National Institute for Industrial Environment and Risks, and an expert in IEC TC 31: Equipment for explosive atmospheres. Houeix, an IECEx Lead Assessor, is also one of the founding member experts behind the IECEx CoPC (Certification of Personnel Competence) Scheme.

Peter Thurnherr
Peter Thurnherr has many years’ experience in the design and production of electrical apparatus for gas and dust explosive atmospheres. He heads up the Swiss company thuba Ltd., which has been manufacturing explosion-proof electrical apparatus since 1955. He is Chairman of the Swiss TC 31 mirror committee and a member of several IEC TC 31 working groups and maintenance teams.

Practical information

There will be two sessions, one in English and one in French, each of which will welcome 30 participants.

The sessions will be held at CIE and CIPREL sites.

For registration and more information on the event and venues, please go to: http://www.iec.ch/meetings/events/

Safer electronics

IECQ focuses on “green” electronics and fights counterfeiting

Electronic components play an ever increasing role in our lives. Homes, offices, factories and transportation systems all rely heavily on them. Mobile telephones, computers, car and airplane navigation systems and automated production chains wouldn’t exist without them. They make our lives easier and provide better communication in a world that has become global and interconnected.

IECQ certification saves time and costs

Because electrical and electronic products contain many, sometimes hundreds, of individual components and sub-assemblies, manufacturers want to be assured that the electronic components used in their products are of the required quality and reliability. To minimize incoming inspection costs and eliminate the need to carry out a quality audit on parts, they can choose suppliers who hold product approvals for their components.

IECQ, the IEC Quality Assessment System for Electronic Components, provides certification at the international level for a wide variety of electronic components. At present, there are eight families of components covered by IECQ:

- active components, including integrated circuits
- electromagnetic components
- electromechanical components
- electro-optic components
- hybrid integrated circuits

The demand for “green” electronic components is soaring
• passive components
• printed boards
• wires and cables

Then there are the processes and related materials that are incorporated in the electronic components and assemblies. But there is more to electronics than just the testing and certifying of components. IECQ is continuously expanding to address industry’s needs: hazardous substances and avionics for example, or more recently ESD (electrostatic discharge).

**Compliance with legislation made easy**

Concern for the environment and the need to eliminate hazardous waste prompted IECQ to devise a new scheme to help electronic component suppliers prove that their products comply with the requirements to be free of hazardous substances. That was in 2005. Since then, the IECQ HSPM (Hazardous Substances Process Management) Scheme has grown tremendously.

Many countries have passed or are considering legislation restricting or forbidding the use of hazardous substances in electronic components. In the European Union, the RoHS (Restriction of Hazardous Substances) in electrical and electronic equipment and WEEE (Waste Electrical and Electronic Equipment) Directives took effect in July 2006. The revised RoHS Directive came into force in July 2011 while the new WEEE Directive was published in July 2012.

Through IECQ HSPM certification, electronic component manufacturers and suppliers can demonstrate that their electrical and electronic components and assemblies meet hazardous-substance-free specific local, national and international requirements. IECQ HSPM certificates have gained tremendous recognition in recent years and continue to do so, thus helping to reduce costs and time to market and eliminating the need for multiple testing.

**Long-term supply control**

The avionics industry is increasingly dependent on COTS (commercial off-the-shelf) electronic components. These are principally mainstream products, designed and manufactured not just for aerospace but for a wide variety of industries. But the sector has to meet its own requirements in terms of performance and durability.

The avionics industry also has to face a new threat in the form of counterfeit electronic components. Counterfeit prevention is essential for avionics applications, where reliability and safety are of the utmost importance. The IECQ ECMP (Electronic Component Management Plan) provides aircraft manufacturers with a global assessment and certification scheme covering their suppliers. Companies such as Boeing and Airbus are just two examples of those fighting against product piracy.

**Presence at major trade shows**

For many years, IECQ has been showcased at two leading events:

- **electronica** in Germany, where IECQ is invited and hosted by the VDE Certification and Testing Institute, one of the long-standing IECQ Certification Bodies. VDE and IECQ will again join forces and participate in the 2012 electronica show. Electronica, run every two years, is a major electronics trade show with thousands of exhibitors. Steve Allan, of the IECQ Secretariat, will be present at the VDE Stand.
- **TAITRONICS** (Taipei International Electronics Show), through the efforts of ECC Corporation (the US Member Body of the IECQ) and its Chinese Taipei representative, CTECCB (Chinese Taipei Electronic Components Certification Board). IECQ will again be showcased and David W Smith, IECQ Chairman, will participate as a key guest.

TAITRONICS is one of the most important electronics shows, attracting hundreds of manufacturers and suppliers not only from Asia but also from the rest of the world. It presents a great opportunity for IECQ to network and meet with professionals who have placed their trust in the System over a number of years, as well as to heighten its visibility in a very competitive market.

The IECQ website – [www.iecq.org](http://www.iecq.org) – provides detailed information of each of its schemes.

**The avionics industry has to face a new threat in the form of counterfeit electronic components**

**The CTECCB stand at TAITRONICS 2011**
The work carried out by IEC-LARC (Latin America Regional Centre) and IEC-APRC (Asia-Pacific Regional Centre) is essential to promoting the work of the IEC in their respective regions. Throughout the year, Amaury Santos, Regional Manager IEC-LARC and Dennis Chew, Regional Director IEC-APRC organize and participate in a number of events, raising awareness of the IEC’s work and engaging stakeholders. 2012 marks an important landmark for both regional centres, as LARC celebrates its 5-year anniversary and APRC its 10th. Below is a roundup of some of the events of the past 12 months.

**Latin America**

**COPANT General Assembly**
The COPANT (Pan American Standards Association) General Assembly was organized by Brazil’s national standards body ABNT (Associação Brasileira de Normas Técnicas) and took place in Fortaleza, Brazil on 7-8 May 2012. Present at the event were IEC Immediate Past President Jacques Régis, IEC Deputy General Secretary Frans Vreeswijk and IEC-LARC Regional Manager Amaury Santos.

The annual event offers the IEC the opportunity to network with COPANT members and to promote participation in IEC standardization and CA (Conformity Assessment) work. Régis updated attendees on recent IEC work and activities and stressed the importance for industry in participating actively and being represented in the IEC NCs (National Committees) in order to benefit fully from IEC work.

**Other events**
IEC-LARC was present at a number of other events, such as the Energy & Integration Forum that took place in Uruguay in November 2011 and the Smart Grid forum in Brazil, also in the same month. Santos was present at the ITU (International Telecommunication Union) Forum on Conformance and Interoperability for the Americas in June this year, while the centre organized the IEC Forum on International Standardization and Conformity Assessment for the Electrical Sector which took place in Colombia in August.

A particular achievement was the establishment of a NEC (National Electrotechnical Committee) in Ecuador. Establishing a NEC is an important step for IEC Affiliate Countries, as it allows national stakeholders to have a say in the selection and adoption of IEC International Standards that are relevant to their market and encourages participation and discussion on electrotechnical standardization.

LARC, in cooperation with the IEC Central Office has organised a number of virtual training courses on the use of IEC IT tools, covering countries of the Andean Community – Bolivia, Colombia, Ecuador and Peru as well as Costa Rica and Honduras in Central America. During the past 12 months, Santos also made promotional visits to Chile, Colombia, Uruguay and Venezuela.

**Asia-Pacific**

**10th JISC/IEC/IECEx Human Resource Development Seminar on Standards for Green Society**
The seminar, organized by JISC (Japanese Industrial Standards Committee) in collaboration with IEC-APRC focused on promoting awareness as well as the latest developments in energy efficiency requirements in standards for electrical and electronic products. The need of harmonizing those requirements was another focal point of the presentations and discussions that took place at the two-day event hosted by the Philippines NC (National Committee) held in Manila in December 2011.

With a number of IEC TCs (Technical Committees) and SCs (Subcommittees) working on addressing energy efficiency issues in the International Standards they are developing, Dennis Chew gave an update of their work. He went on to provide an overview of the IT tools facilitating experts’ participation in the IEC. The seminar, which was attended by experts from 8 countries, was also an excellent opportunity to encourage more active participation in the IEC.

**ACCSQ (ASEAN Consultative Committee on Standards and Quality)**
ACCSQ has been working towards the harmonization of standards and technical regulations in the Southeast Asia region in a bid to reduce technical barriers to trade and help establish the ASEAN (Association of Southeast Asian Nations) Economic Community. On the occasion of the 38th ACCSQ meeting in March 2012 Pierre de Ruvo, IECEE Executive Secretary, and Chew were both present. De Ruvo gave a presentation focusing on the IEC Affiliate Country Programme for
developing countries before going on to present the IECEE System and its benefits.

In addition, IEC-APRC also participated at the ACCSQ JSC EEE (Joint Sectoral Committee on Electrical and Electronic Equipment) meeting which took place in Phnom Penh in May. The ACCSQ JSC EEE is a forum for regulators of electrical and electronic equipment to implement the ASEAN Harmonized Regulatory Regime for Electrical and Electronic Equipment.

Another event which falls under the Southeast Asian region was an ASEAN workshop on Renewable Energy Technical Standards and Harmonization organized in Hanoi in March. Chew participated and delivered a keynote address on ‘Renewable Energy Standards from an International Perspective – Developments and Outlook’. The event was organized by ASEAN-RESP (Renewable Energy Support Programme) for ASEAN and the ASEAN ACE (Centre for Energy).

APEC Subcommittee on Standards and Conformance’s Joint Regulatory Advisory Committee on Electrical and Electronic Equipment

The IECEE, the IEC Conformity Assessment Scheme for Electrotechnical Equipment and Components, and the IEC-APRC are regularly invited to be part of the JRAC seminars and meetings, considering the importance of standards and conformity assessment in facilitating free trade and economic development.

Dennis Chew (on behalf of Pierre de Ruvo) and Derek Johns, Chairman of IEC TC 61: Safety of household and similar electrical appliances, gave a joint presentation on Risk Assessment in the IECEE CB Scheme and the IEC’s approach to Risk Assessment Standards Methodology at the APEC (Asia-Pacific Economic Cooperation) Joint Regulatory Advisory Committee for Electrical and Electronic Equipment Meeting and Workshop held on 15-18 May in Singapore. The key message to the workshop participants was that risk assessment is intrinsically covered in the IEC standards and the IECEE CB Scheme.

PASC (Pacific Area Standards Congress)

The congress, which takes place annually brings together Chief Executive Officers and senior representatives of national standards organisations as well as industry experts from the Asia-Pacific region to discuss the latest international standardization developments. Chew was accompanied by Jacques Régis, IEC Immediate Past President, and Hiromichi Fujisawa, IEC Vice President. The theme of PASC 35 was the implementation of environmental sustainability standards and with IEC very much active in the area, a number of presentations were given providing attendees with insights into relevant IEC work.

At the event which took place in South Korea in June of this year, Régis took the opportunity to congratulate IEC-APRC on its 10th anniversary while Malaysia complimented the team on the training provided by the centre throughout the year.

Other events

On the conformity assessment front, Chew together with de Ruvo and Wal Robson of IECEx spoke at the IEC/IECEE/IECEx workshop which took place in Hanoi in May in collaboration with the Vietnamese NC. Chew and Robson also presented at the IECEx Industry Dialogue that took place in Indonesia and Singapore in May to promote awareness of the IECEx System.

In the field of lighting, APRC participated in the APEC LED Workshop in November last year and at the 5th lites.asia meeting held in Beijing in June to provide the latest updates on IEC activities.

Finally, the APRC team worked hard to enhance participation within the IEC family. In view of that, a regional workshop was organized at the APRC offices in March of this year. The theme of the training was ‘Enhancing participation in the IEC work’. The objective of the training is to equip both experts and National Committee/ Affiliate staff with the tools to participate more effectively in the IEC and hence, benefit more fully from membership or the Affiliate Country Programme. It was designed as an intensive and interactive session and attracted participation from members Malaysia, Indonesia and Singapore and Affiliates, Bhutan, Cambodia and Papua New Guinea.

In addition, a series of TISS (Technical Information and Support Services) trainings took place in China, Japan and Korea in May.
IEC WORLD

Smart Grid events
Special deals for IEC experts

The IEC regularly lends its support to key global and regional industry events allowing them to put forward IEC endorsement on their website and materials.

This month we would like to attract your attention to two Smart Grid related events.

GridComms
Sheraton Park Lane Hotel, London, UK, 22 October 2012
GridComms is focused on Smart Grid Communications infrastructure, integration of next generation technologies, network and data management, customer engagement technologies, and industry collaboration. The event aims at bringing together communications professionals to discuss the importance of building and securing Smart Grid networks.

IEC experts benefit from a 10% discount using the code: Partner10 on the registration website.

Information: call +1 215 504 4272 or go to www.gridcomms.com.

4th Annual Smart Grids Smart Cities Summit
Singapore 25-28 September 2012
Smart Grids Smart Cities Summit is the only event in the region that bridges the gap between all stakeholders, demonstrating the practical application as well as the benefits of smart energy management, from utility T&D through to large and small city-wide applications in eco town developments, business/industrial parks, residential developments, island and off-grid communities, transforming the way energy is distributed and used.

IEC experts benefit from a 15% discount using the code: P10470IEC15

Information: call +65 6508 2401, or email: register@ibcasia.com.sg or go to www.smartgridssummit.com

Please let us know if you feel a global/regional event in your industry would benefit from IEC endorsement: info@iec.ch

IEC work helps companies gain the trust of stakeholders and investors

Many companies around the world participate actively in IEC standardization. IEC Global Visions has interviewed some of their CEOs and CTOs to find out why - despite economically challenging times - they see value in sending experts to work in the IEC.

CEOs and CTOs are notoriously busy people. They generally don’t like to waste time on details and unimportant stuff. The fact that so many of them have accepted to be interviewed for IEC Global Visions is testimony to the importance they allocate to our work.

Small and big companies depend on the trust of consumers, investors, regulators and even insurers to build new or expand existing markets. IEC work helps them gain that trust. IEC International Standards contain key elements that allow companies to take important short-cuts; the kind that allows them to build consistently and verifiably better products. Industry leaders tell us that because of their participation in the standard setting process, they are able to reduce production cost while improving innovation and design processes. When their standardization experts sit at the table where the rules for global trade are written, they are able to ensure that their company’s technologies are taken into account and that competition doesn’t have the only say.
IEC NCs (National Committees) have selected their 2012 IEC YPs (Young Professionals) who will represent their country at the third YP workshop to be held during the 76th IEC General Meeting in Oslo, Norway, on 1-3 October 2012.

Welcome to the IEC Community
For most of the YPs attending the 2012 workshop, the IEC General Meeting is their first “live” exposure to standardization at the international level. To enhance their experience and welcome them to the IEC community, all

When we talk to CEOs of new industries or of start-ups they tell us that their participation in the IEC makes it easier for them to convince investors or gain regulatory approvals. They find it allows them to avoid mistakes others have made before and helps them in the certification process.

“The IEC is the preeminent standards body at the international level in the electrotechnical sphere and so there are many IEC standards that have been used historically in the grid and newer standards that are under development. By having international standards that are as uniform as possible around the world, it helps everyone. It reduces the costs for the manufacturers, which in turn reduces costs for electric utilities and ultimately reduces electricity rates for consumers.”

GEOGE W. ARNOLD,
Chief Operating Officer, NIST
(National Institute of Standards and Technology)

“Our active participation in the IEC allows us to build trust in our products among our worldwide customers and ultimately millions of end-consumers. Participating in IEC work has proven to be the most effective way for us to build our business and open new markets. I believe that any company that wants to sell and promote its goods and services to the global market has a strong interest in participating in IEC work. The IEC can help you promote your products to global customers, distributors and industry within the shortest time and at lesser cost. By participating in the IEC, we learn a lot from our international peers and this increased knowledge also helps us in our technology development.”

DR ZIDA YU,
Senior Vice President and Corporate Technology Officer, Haier Group

“We view IEC as the most global standards body that’s available to us, for us to work through. And I think that particular aspect is so important because we can’t have - really - country specific standards in the future. The cost of that is too high, we have to go to a much more global set of standards. Our involvement with IEC is extensive, we suspect over time it will be even larger because we think IEC will play an even larger role. And that’s why we participate. Involvement in standards, I think, is one of the best investments a company can make. We’ll all be powerfully influenced by standards in the future. It’s already happening today but certainly it will be more so in the future.”

THOMAS S. GROSS,
Chief Operating Officer, Eaton Corporation
delegates are encouraged to approach them, introduce themselves and engage them in conversation. How to recognize the IEC YPs? Easy, they have a green badge.

Who they are
The IEC Young Professionals programme was launched in 2010 as a means of getting Generation Y – people in their 20s and 30s – more involved in IEC activities at the start of their careers.

The IEC YPs are technical, managerial and/or engineering professionals who are already familiar with the world of standardization and CA (Conformity Assessment), either because they develop standards or because they use them in their work.

New on the agenda
Suggestions from the 2010 YP Leaders have been incorporated in the 2012 agenda.
As a consequence, and for the first time this year, a working breakfast will be held on the last day of the workshop for YPs to meet and talk with their country’s NC Officers. This is particularly important because, as with all delegates and experts, the NC will be their primary contact point for participation in IEC activities.

Another new activity for the 2012 workshop will be the Open Space session, also scheduled on the third day, which is reserved for YPs only and will be moderated by 4 YP Leaders. The session will allow the participants to discuss topics of their choice with their peers and provide ideas, comments and suggestions.

Experiencing the world of standardization from the inside
This year’s workshop again takes place over three days. After a reception on the evening before to welcome all participants, the workshop begins with detailed explanations of the world of IEC International Standards and Conformity Assessment.

YPs hear about the personal experiences of the 2010 and 2011 Young Professional Leaders and about the programme itself. They learn what to expect when attending an IEC technical meeting, are given a detailed explanation of the IEC structure and its membership, and have time to ask questions and obtain additional information.

They sit as observers at the SMB (Standardization Management Board) and CAB (Conformity Assessment Board) meetings and attend the technical meeting of their choice. Breakout sessions are also on the agenda.

Challenges in applying standardization
The final day starts with an interactive session where YPs split into 4 groups, each group dealing with a specific topic. This year’s topics cover IECEE and conformity assessment; the IEC IT Tools, to prepare for the specific needs of the future experts and managers of the IEC; a mock technical meeting to offer participants the opportunity to develop their negotiation skills; and the standards development process for those who are less aware of standardization work.

A better understanding of standardization
YPs who took part in the two previous workshops all say they have come away from the three-day gathering with a deeper understanding of standardization, a broadened network and the satisfaction of feeling part of a bigger world in which they have a personal role to play. Many have found it provided them with an opportunity to express their ideas not only to their peers, but also to some of the experts and management present, and to suggest how their knowledge in certain technical areas might be used in the context of particular technical or conformity assessment work.

Benefits for all
Not only has the feedback from participants been enthusiastic and positive, their employers have underlined benefits too. Organizations have found that, by enabling their employees to take part in the Young Professionals’ Programme, not only have they helped provide their staff with fast-track access to the world of standardization and boosted their personal motivation, but that the company profile has improved in the eyes of the customers and they have created the potential for making new contacts and embarking on new projects.
Succession planning for standardization
Mobilizing Young Professionals

by Stephanie McLarty, 2010 Young Professional Leader

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Filling the know-how gap
Sitting in a standards working group meeting or at a conference about standards, I am easily reminded with one glance of the room that this is a sphere dominated by the baby boomer generation. These individuals have brought tremendous knowledge and experience to standardization. The number and depth of standards created has been unprecedented. The benefits towards trade, health, safety, and well-being brought to the world have been remarkable.

Yet there is a glaring issue. Many of these experts are likely to retire in the next ten years. Of all human resources trends, baby boomer retirements have been identified as having the most significant impact on the workplace over the next decade. The hole the baby boomers will leave behind is not just about individuals occupying seats. They will leave a gap of know-how and experience that is extremely difficult to fill.

Getting more young people involved
The push to get more young people involved and coming up the ranks therefore is seen as a necessity. But the challenging question is how to get more young people involved. Standards bodies everywhere are grappling with this issue. The problem is further complicated by the fact that standards often are not a subject studied in school, or one into which young people directly launch their careers. Most standards professionals enter the field as a result of their industry experience.

There is hope, though, and I say that from what I have witnessed. I became involved with the IEC in 2008 and participated in their first YP (Young Professionals) programme in 2010. After being selected as one of three global young leaders of the group, I gained the opportunity to speak with a number of the YPs, asking them probing questions such as: Why join standards work? Where do you see the future of standardization? What will keep you interested? Their answers were fascinating.

As an entrepreneur, owning my company REfficient, I have developed a pretty good instinct for opportunity. As such, I am convinced that the issue of getting more YPs involved is not actually a problem. Rather, this is an opportunity for the standards world to grow, evolve, and prosper. This is the awakening into its next phase of evolution. By sharing the lessons learned, all standards organizations can benefit, as well as the standards world as a whole.

In the rest of this article, I will discuss the IEC YP programme and key feedback from the YPs on why they have chosen to get involved in standardization. I also will discuss lessons learned and considerations for any YP programme. Finally, since all of us in the standardization field are responsible for the success of the industry as a whole, I will provide suggestions on how to take action.

IEC Young Professionals Programme
The IEC launched its first YP programme in 2010, with a workshop in Seattle, Washington, in conjunction with the IEC General Meeting. In that inaugural year, 53 participants from 27 countries took part in the workshop, with the age range being from 25 to 35 years old. The level of experience with standards varied, from individuals who had been part of writing standards for many years to those who were completely new to the industry. Regardless, the purpose was to reach out to the younger generation to encourage long term participation in standardization and conformity assessment.

The YP workshop was held over three days, and included lectures, interactive sessions, and an industry visit. YPs also observed a working group meeting as well as an SMB (Standardization Management Board) session. Questions were encouraged throughout the workshop, and YPs used the opportunity to get clarification and to ask probing questions. Social events also took place, as well as YPs being recognized at the major events of the IEC General
Meeting, such as the opening and closing ceremonies. The YPs also had an opportunity to choose three leaders to represent the group going forward.

Following the workshop, 100 percent of YPs said the workshop had been valuable and 96 percent planned to get more involved in IEC work. It was clear that enthusiasm was garnered at the workshop, yet it was more than that. Something had taken root. Eight months later, when a survey was conducted to measure the results of the YPs’ involvement, 62 percent said they already had experienced an increase in standards participation. At that time, 38 percent had experienced a change within their National Committee or IEC positions. Furthermore, 97 percent said they had shared information about standardization and about IEC with their colleagues.

While there were many lessons learned following the 2010 workshop (which I will discuss later), the 2011 IEC YP workshop had a similar impact. Thirty National Committees sent 59 YPs to the workshop in Melbourne, Australia, which took place during the 2011 IEC General Meeting. The workshop had a similar format to the previous year, although it also included observing the CAB (Conformity Assessment Board) meeting and the opportunity to provide insight into IEC issues, such as the future of IT tools. After the workshop, the participants revealed that 90 percent of their expectations were fulfilled, and 91 percent said they wanted to become more involved in IEC work. While it is still too early to measure the results of continued involvement from the 2011 workshop, it was clear that IEC did something very well: they tapped into why YPs would want to get involved and got them engaged.

Why Young Professionals get involved
After being chosen as a YP Leader, I conducted interviews with YPs to find out more on why they got involved in standards work and in the IEC, and to get their feedback on the programme moving forward. While some individuals had their own unique reasons for participating, common themes became clear. These themes crossed over backgrounds, nationalities and gender, as well as interests and professional industries. The reasons YPs got involved in standardization included:

- To see how standards are developed: YPs were keen to understand the process that goes into creating a standard, from the conception and working group stage to the final publication. Many YPs had been involved in some level of the standards process, but had only seen a limited view of the bigger picture. When YPs learned the overall process of standardization, they gained an insight into the greater impact of their involvement. This was a key motivational factor for YPs – that their involvement mattered and they could make a difference in a large way.
- To ensure that their companies’ interests are considered: YPs saw both opportunities and challenges within their companies when it comes to standardization. They wanted to ensure that they had a voice and that their considerations were included.
- To understand upcoming standards, industry trends, interoperability requirements, etc.: Especially in today’s global age, YPs knew that their companies, or even their countries, were not isolated from what happens around the world. Rather, a global system is at play, and the outlook of YPs reflected this. To have their products work in other jurisdictions, YPs knew that they needed to understand the requirements of other countries. YPs also understood that while standards take time to create, the world does not wait. Therefore, it was important to keep pace with upcoming trends and innovations.
- To advocate on a national level for international best practices: Understanding what is happening on an international level is one part of the equation for success. YPs recognized that it is important to advocate for international best practices on their national levels. This allows them to compete more effectively on a global level.
- To share and get knowledge: YPs saw that there was a valuable opportunity to share the knowledge and insight they had acquired from their own experiences, as well as to get that from others. YPs particularly
saw value in becoming informed about the challenges or trends in others’ countries or companies. In this sense, they appreciated that a two-way community was being built.

- **To expand their professional network:** YPs saw involvement in standardization as a unique opportunity to get to know other individuals in their industries with similar interests and positions. This was particularly true for individuals within the same industry but living in different countries. YPs would not otherwise have had the opportunity to connect. In many cases, the connections that were fostered during the YP workshop have continued.

As I interviewed the YPs, it also was clear that they wanted their voices to be heard. Some interviews lasted for an hour and the YPs were happy to provide insight on how they could become more involved moving forward. While some of the points consider the international perspective of standardization, there are many lessons to be learned for standards bodies on any level.

**Turning key lessons into action**

Where do we go from here? How do we turn these learnings into action? The YPs had many suggestions about what they would like to see, the barriers that would need to be addressed, and how the programme should move forward. The following are steps to mobilizing participation of YPs through a formal programme.

1. **Ensure that there is a well-known point of contact to get involved.** Creating a point of contact that YPs can approach and get connected with opportunities is vital. This individual or department then can match YPs with suitable opportunities as well as provide a sounding board for questions and concerns. While this seems simple, this is a crucial step that is sometimes missed. For example, within the IEC programme, we realized that for YPs to get further involved in standardization, it actually would be at the national level. Therefore, it is important that YPs have the ability to connect with their national committees so they can have hands-on opportunities.

2. **Use various communications platforms to keep YPs involved.** YPs are used to using technology and expect no less when it comes to standardization. YPs want to use a variety of communication tools to keep connected, such as email, webinars, wikis, blogs, shareweb tools, etc. Their key reason was to allow individuals to identify similar areas of interest, connect with others, and allow for discussion. YPs also identified other areas where they would like to see technology integrated in future – for example, allowing people to work on the same standards document simultaneously was a key suggestion.

3. **Mobilize social media.** The statistics for the use of social media today are staggering. There is no question – YPs are using social media. Still, even they identified that there was an appropriate use of social media in the standards domain. A consensus from the YP group was that social media was a medium to connect and stay informed on what is happening, but it was not a place to publicly share opinions or debate issues.

4. **Connect YPs with the bigger picture.** Given a generational characteristic of being achievement-oriented, YPs want to see the greater result of their actions. Giving them the opportunity to connect with the bigger relevance helps them to get engaged and keep motivated. This could include giving the opportunity to provide input into key documents, shadow a meeting normally beyond their scope, or invite them to an exclusive event. In the process, future leaders may be identified to nurture throughout the system.

5. **Educate about the benefits of standardization.** Standards play a vital role in global trade, as well as for human and environmental well-being. Still, a surprisingly large number of people remain unaware of standardization and its significance. It is therefore important to educate young people about the benefits of standardization. This includes having measurable results and case studies of how standards have helped. But that is not all. Marketing these benefits to drive awareness is equally important. The workshops have shown that when you connect people with the higher order, their interest is sparked and they become more engaged. “Make standards sexy” and YPs will become more involved.

6. **Solicit their insights.** Ask for YPs’ feedback and take them seriously. The world is changing at breakneck speed. With the continued infiltration of social media, young people have more of a voice than ever before. Their influence does not stop there; even Google now considers social media activity into its algorithm for search results. It is therefore important to solicit the opinions of YPs and take them into consideration. Whether you set up a focus group, send periodic questionnaires, or use another mechanism, YPs want and expect to be heard.

7. **Provide related training.** Professional training is necessary to keep people informed about industry developments. YPs are no different. They want opportunities to improve their skills and learn about new advancements. Accordingly, providing events and courses to YPs is important. As technology is increasingly being leveraged to reduce costs, webinars are a great option to provide training to YPs on a low budget. Such trainings are also a great way to keep YPs engaged in the long term.

8. **Deal with the real questions straight on.** In the YP interviews, many key questions that YPs were
facing came up repeatedly, such as “How do I convince my employer that participation in YP standardization programmes is worth it?” Given that such issues were potential barriers to participation, we decided to create a manual written by the YPs themselves to address these questions and to be used as a resource. After all, when we understand the real benefit to our company, our country, and our society, participation becomes easier.

The standardization industry needs to get better at measuring results and benefits, and communicating the results.

9. As an employer, get engaged. While some YPs reported that their employer had asked them to do a presentation or write a report, many employers did not follow up. This is important due to knowledge transfer and motivation to keep involved. Create opportunities for YPs to become involved and share what they have learned.

10. Set aside funding. To ensure successful standardization succession planning, standardization bodies and employers should set aside funding to nurture YPs. This could include funding to allow YPs to participate in standards meeting, conferences, and events as well as time to participate in webinars, etc. By setting aside funding, you are in part investing in your company’s future, and beyond.

11. Have a mentorship programme. For anyone starting out in standards development, questions are bound to come up. By connecting young people with an experienced individual, YPs will have someone to ask questions and help them navigate the system. While creating a mentorship programme may take time, many YPs identified this as a long term goal that could be very beneficial. There are other factors which are important for creating a successful programme of any kind. Getting buy-in from key decision makers, effective planning, and measuring results are other aspects. The key is to start somewhere, and mobilize the participation of existing YPs.

Reaching to the future

These considerations were learned as a result of being a YP leader within IEC and being able to interview fellow YPs. They also are based on my experiences in standardization and the challenges I have faced. It is important to note that what works for one organization may not work for another. However, most, if not all, of the lessons learned and principles can transfer across organizations and industries.

A common question is where to find the YPs. While a relatively small number of YPs may already participate in formalized standards working groups, it is important to start targeting YPs prior to that. Whether you are in industry, a standards body, or academic institution, the key is to look for upcoming engineers, project managers, or other similar individuals within your organization. Another recommendation is to ask YPs involved in standardization if they know of any other YPs who may be interested in participating. After all, these YPs may have former classmates and friends that they can suggest.

Whether or not you are directly tied to succession planning, we all have the responsibility for ensuring a strong future of standardization for years to come. If you know of a YP, you can start by getting them involved in existing standards work. Tap into your network for opportunities. Many YPs will appreciate the opportunity to start shadowing groups, gaining experience, and even providing input. YPs also can get involved in the national standards bodies, which are mobilizing around this issue. Succession planning is crucial for any business or organization. Given the reality of retirement in the standards world, succession planning for standardization is especially critical. This issue does not have to be a negative; rather it is a positive opportunity to usher in a new era of standardization. Given the speed at which the world is changing, mobilizing YPs can encourage the standards world to grow stronger together.
IEC Young Professionals move ahead

Tania Cerda at ConnectivityWeek 2012

Tania Cerda, of Schneider Electric Mexico, took part in the first IEC YP (Young Professionals) Workshop in October 2010, during the General Meeting in Seattle, USA. In May 2012, she was invited, as an IEC Young Professional, to participate in ConnectivityWeek 2012, held in Santa Clara, California, USA, an event that brought together experts from all around the world. She talked to e-tech about ConnectivityWeek and her involvement in the Young Professionals programme.

The Mexican grid

At ConnectivityWeek, Tania Cerda took part in a session on DR (Demand Response) standards, moderated by Richard Schomberg, EDF (Electricité de France) Group Vice President Smart Energy Standards and Convenor, IEC SMB (Standardization Management Board) SG (Strategic Group) 3 on Smart Grid. Cerda spoke about the Mexican Smart Grid situation from a standardization perspective. This gave her the opportunity to explain the specificities of the electrical grid in Mexico: one government-owned utility and one grid connecting the whole country. Political, social, economic and technical issues have to be taken into consideration whenever a decision on energy has to be made. Standards are essential to set the bases for meeting the targets requested by system users.

From YP 2010 to ConnectivityWeek

Cerda is a Business Developer at Schneider Electric Mexico, in charge, among others, of EE (Energy Efficiency) and renewable solutions, EV (Electric Vehicle) charging solutions, smart meters and the molded-case circuit breakers for the Mexican market. Because of her professional profile, her participation in the first YP workshop and her subsequent involvement in the Programme, Cerda was invited to ConnectivityWeek to bring in the younger generation’s perspective on standardization and the evolution of the grid.

An invaluable experience

Cerda was one of the YPs selected by the Mexican NC (National Committee) of the IEC to participate in the first workshop in Seattle. Since then, she has kept involved in the programme, contributing comments, suggestions and ideas through the IEC Young Professionals Forum.

Having worked at ANCE, the Mexican Standardization and Certification Association, Cerda was already familiar with standards development when she became a Young Professional. She explained that participating in the workshop was an opportunity to discover a new approach to standardization and to learn about the IEC, international standardization and CA (Conformity Assessment) activities: Attending IEC management and technical meetings as well as having the chance to speak and network with leading experts was an invaluable experience that helped make her job easier. She uses standards every day as a basis to make professional decisions and to keep abreast of market trends. She also actively promotes participation in standards development within the company to ensure that it is well represented. For Cerda, “participation in standardization work is a good business investment.”

As a professional in the energy sector, Cerda says: “Standards provide the reliability, sustainability and safety required to develop solutions that meet customers’ needs. This is even more important in fields that are in constant evolution, such as energy efficiency and Smart Grid.”
Share your work

We want your stories

Nearly 10 000 experts work in the IEC. They may only be aware of the activities of the particular TC/SC in which they work. One of the goals of e-tech, the IEC’s monthly publication, is to change that. In 2013, the e-tech editorial team will be reaching out to TC/SCs to get their stories.

A wide-range audience of professionals
You participate in the IEC as an expert on a particular topic. At the same time, you and your family members and friends pursue hobbies, consume products and use devices and systems that have been standardized by your colleagues in the IEC without your necessarily knowing about it. We want to bring the work of the IEC, and its relevance to your everyday life, closer to you.

Today, e-tech reaches more than 18 000 readers around the world. Each month the IEC publication covers a different topic that describes the work of a variety of TC/SCs (Technical Committees and Subcommittees).

Articles are written so as to be of interest and accessible to a wide-ranging audience of professionals. The aim is to increase the awareness of IEC work – your work – both within and outside the organization.

In 2013, as in 2012, we plan to continue and increase this sharing and get your input on TC/SCs as well as include articles that are of direct relevance to your area of expertise.

This is our editorial plan for the coming months of e-tech. We look forward to receiving your comments, news and suggestions.

About ConnectivityWeek
Beginning in 2003 as a building-focused conference, BuilConn has expanded into ConnectivityWeek to meet the evolving needs of the various industries converging around the smart-energy movement, including: major consumption verticals, utilities, and ICT (information and communication technology). These industries have the potential to realize significant positive impacts to their bottom line – and the environment – as they integrate the principles of smart, connected energy into their business models. Each vertical also has a significant opportunity to learn from other industries’ best practices in energy management.

ConnectivityWeek calls the application of smart, connected energy E2.0 (Energy 2.0), and in 2012, is exploring how this can be applied to commercial buildings, homes, and critical infrastructure to manage the consumption and distributed generation of energy more effectively and efficiently.

As a Business Developer, Cerda is in charge, among others, of smart metering
...in April, it will be transportation...

**e-tech focus for 2013**

**January/February**

Multimedia and appliances
Fuel cells for electronic devices, colour measurement and management, EMC and electrostatics, MEMs, magnetic and electromagnetic fields associated with human exposure, safety of electronic equipment, electronic display devices, environmental standardization

**March**

Natural phenomena
High frequency and transient phenomena, solar storms, lighting, dust, humidity, extreme cold/heat

**April**

Transportation
Trains, chair lifts and cable cars, in-factory or warehouse transportation, aviation, public transportation

**May**

Medical equipment
Hospital, emergency, diagnosis and treatment equipment
Electromagnetic phenomena

**June**

Supersmall, superbig, superfast
Nanotechnology, superconductivity, energy harvesting

**July**

Marine and hydro energy
Small, medium, large hydro; river, estuary, tidal and wave energy, OTEC (ocean thermal energy conversion), steam and other turbines, pumped storage

**August/September**

Lighting + laser
From watt to lumen, industrial lighting, aquarium/pool/commercial/shop lighting, hand lamps, batteries

**October**

Year in review

**November**

Smart Cities, Smart Grids
Storage, renewables, smart buildings, centralized heating/cooling, microgrids, sensors

**December**

GM Special + Safety and enclosures
EMC, protection against electric shocks, radiation instrumentation protection, dependability, safety of motor operated electric tools

...and in July marine and hydro energy
2012 Awards
Recognizing commitment to the IEC

Every year the IEC honours the commitment and work of a number of individuals in its community who, through their leadership and technical expertise, have contributed to making products and electrical systems safer, more energy efficient, more reliable and more compatible.

Lord Kelvin Award - IEC’s highest distinction
Created and first awarded in 1995, the IEC Lord Kelvin Award is named after the IEC’s distinguished first President, William Thompson, Lord Kelvin. It is the IEC’s highest tribute and is awarded primarily in recognition of the long-term technical contributions that outstanding individuals have made to the Commission.

Nominations for the Lord Kelvin Award can be made by IEC NCs (National Committees), TC (Technical Committee) and SC (Subcommittee) Chairmen, and members of the CB (Council Board), SMB (Standardization Management Board) and CAB (Conformity Assessment Board). They submit their proposals based on their recognition of contributions made over time, irrespective of the nationality or technical area of the nominee.

Thirty-three laureates have to date been honoured with the IEC’s highest accolade. To qualify, candidates must still be active in the IEC and have contributed significantly to IEC work over more than five years, particularly through their leadership and technical contributions to international electrotechnical standardization, CA (Conformity Assessment) or related activities. The Award recognizes the major role that a person has played to the extent that their contribution has considerably benefited industry or commerce, or promoted the IEC’s image in the business world.

Friedrich Harless to receive the 2012 Lord Kelvin Award
The 2012 laureate is Friedrich Harless of Germany. A special ceremony will be organized for him during the Council Statutory Session at the IEC General Meeting in Oslo, Norway, on 5 October 2012. He is to receive his gold medal, gold lapel pin and certificate from IEC President Klaus Wucherer, in the presence of a great number of his peers and colleagues.

Friedrich Harless is Chairman of IEC TC 44: Safety of machinery - Electrotechnical aspects and Chairman of ACOS (the SMB Advisory Committee on Safety). His long-standing contribution to the aims and principles of the IEC has spanned decades. He constantly and openly shares his vast amount of expert technical knowledge and his broad experience in electrical safety with many people. His peers worldwide regard him as one of the most important pioneers in the modern approach to safety.

2012 Thomas A. Edison Award recipients
The IEC Thomas A. Edison Award was awarded for the first time in 2010. It recognizes exceptional achievement in committee management by either current TC/SC Officers or their CA counterparts. The Award can be given to a maximum of nine people in one year.

In 2012, the SMB chose five TC/SC Officers:

- Karen Higginbottom, Chairwoman of ISO/IEC JTC 1: Information Technology
- Derek R. Johns, Secretary of IEC TC 61: Safety of household and similar electrical appliances
- Li Yaping, Chairwoman of IEC TC 90: Superconductivity
- Etsuji Sugita, Secretary of IEC SC 86B: Fibre optic interconnecting devices and passive components
- Claire Vincent, Secretary of IEC TC 78: Live working

The CAB will bestow the Award on:

- Kerry McManama, Chairman, IECEX
- David W. Smith, Chairman, IECQ

1906 Award
The IEC 1906 Award was established in commemoration of the Commission’s foundation in that year and honours technical experts around the world whose work is fundamental to the IEC. Each year a maximum of five awards may be granted per TC, including its various subcommittees.

A total of 140 experts from 49 TCs (including ISO/IEC JTC 1 and IECEE) and 21 NCs were nominated to receive this year’s 1906 Award. It recognizes exceptional recent achievements that contribute in a significant way to advancing the work of the Commission.
Affiliate Country Programme
Welcome to the Bahamas

In July 2012, the IEC Affiliate Country Programme welcomed the Bahamas as its newest participating country. With 82 Members and 82 Affiliates, the IEC Family now numbers 164.

From regional to national
The Bahamas became acquainted with the IEC Affiliate Country Programme through CARICOM (Caribbean Community and Common Market). The benefits of participating in the Programme were highlighted during a CROSQ (CARICOM Regional Organization for Standards and Quality) meeting in October 2010. With the assistance of Trinidad & Tobago and then Antigua & Barbuda, both CARICOM member countries and IEC Affiliates, a dialogue between the IEC and a Bahamian government official was established.

Serve national market, develop expertise
There was some degree of concern on the Bahamian side regarding participation in the programme, since the country doesn’t have an NSB (National Standards Body). The IEC Affiliate Secretariat rapidly quelled these concerns, since the Affiliate Country doesn’t have to be represented by an NSB. Any organization in the public or private sector that is able to identify and recommend IEC International Standards for national adoption in the field of electrotechnology can represent the country within the IEC Affiliate Country Programme.

Standards for national adoption in the field of electrotechnology can represent the country within the IEC Affiliate Country Programme.

The main objectives of the Programme are to encourage developing countries to adopt IEC International Standards at the national level and to acquire the expertise needed to contribute to standardization work. To meet those goals, the IEC helps Affiliates establish the necessary infrastructure, namely the NEC (National Electrotechnical Committee), involving stakeholders from the public and private sector.

The Bahamas join the Programme
In July, the Bahamas signed the Pledge, thus making their participation in the Programme official. URCA (Utilities Regulations and Competition Authority) will assume responsibility for the collaboration with the IEC and offer support as necessary. The contact person is Kathleen Smith, CEO of URCA.

The Bahamas is a country consisting of more than 3 000 islands, cays and islets.

A chain of islands in the North Atlantic
The Bahamas is a country consisting of more than 3 000 islands, cays, and islets. It is located in the Atlantic Ocean, north of Cuba, the Dominican Republic and Haiti, northwest of the Turks and Caicos Islands, and southeast of Florida, United States. In 2009, the country’s electricity production was estimated to be 1,945 billion kWh, while its electricity consumption was 1,907 billion kWh. The Bahamian population is 316,182 (July 2012 estimate).
Training and IT tools development

TISS provides technical support to IEC community

If you are part of the IEC community, whether in an NC (National Committee) or TC/SC (Technical Committee/Subcommittee), you most probably have already been in contact with TISS, the IEC Technical Information and Support Services. IEC Community Business Coordinator Jan-Henrik Tiedemann outlined the major TISS activities and developments for e-tech.

Invaluable support
First and foremost, TISS provides support to the IEC community. It helps solve technical problems and receiving around 30 to 40 email messages every day, TISS collects users’ feedback, comments and suggestions which are essential for future developments.

Defining new and improving existing IEC electronic services
Analyzing the needs of the IEC community and putting the IEC Masterplan into practice, TISS defines and, in a close joint effort with the IEC IT Department, implements new IT Tools, improves those already available and prepares guides on all IEC electronic services.

Developing public commenting
One such new development is the Public Commenting project, expected to be completed in spring 2013.

Public Commenting will be open to any person not currently part of the IEC community wishing to make observations or suggestions on an IEC draft publication at the CDV (Committee Draft for Vote) stage.

To leave a comment, a person will create a login on the IEC website. The person will then be asked to enter the name of the company they represent and the country they are from. All comments will be directly forwarded to the NC of the respective country. It is up to the NC to decide which comments to take into consideration.

The person is also able to receive information about newly published CDVs, provided they indicate the technology fields they are interested in.

Public Commenting will provide NCs with a new source of direct market feedback. It might also prove attractive as a tool for the recruitment of new experts, since individuals who provide regularly relevant comments might become interested in...
joining a national mirror committee. In short, the system is expected to provide an essential avenue for feedback and participation from the stakeholders.

**Training**

TISS also provides training and workshops for NC Officers, TC/SC Officers and experts as well as industry professionals active in standardization and/or CA (Conformity Assessment).

TISS has put in place a detailed training strategy. From in-house and staff training to online training/video conference and regional tours, this strategy covers all parameters for the organization of a training session or workshop. Based on this approach, the first regional training sessions were organized in Asia last May (see separate article in this issue).

**IEC website**

Improvements of the IEC website are currently in the works under TISS project lead. The objective is to provide more direct access to working tools for the IEC community.

The first elements of this new approach will be presented at the 2012 General Meeting in Oslo and completed shortly thereafter. These improvements are a direct result of feedback received by TC/SC and National Committees.

TISS is also the channel through which members and TC/SCs can give comments and suggestions regarding tools and sections of the website to the web development team. The aim is to continuously optimize and improve user experience.

**Ticketing system**

TISS is also putting in place a new ticketing system. The aim is to keep track of requests, whether they are verbal, by email or by phone, up to and including their completion. The system will also allow assigning relevant resources and involving the departments that should work on or respond to a given query. Finally, it will provide a repository for future reference and serve as a basis for the development of FAQs.

The ticketing system, already put into practice between TISS and the IEC IT department, should be made available to all IEC Central Office and Regional Office staff before the end of the year.

**Online meetings and survival kits**

Saving cost is high on the agenda of all members and the companies who delegate their experts to the IEC. This is also the reason why TISS is currently working on improving the IEC web conferencing system, making it more efficient and easier to use.

Last but not least, TISS is also in the process of updating the “Survival Kits” geared to provide guidance to TC secretaries TC Chairmen and Convenors.

A constant dialogue between TISS and the IEC community is essential to continue the development and improvement of all services. Feedback, comments, suggestions can be sent to: tiss@iec.ch.
IEC training sessions in Asia
Raising awareness, increasing participation

As part of its strategy to increase awareness of, and enhance participation in standards development work, the IEC made the decision to have regular training sessions for its members, experts and for the community at large. Three broad geographical regions were defined: Asia, the Americas and Europe.

The first set of trainings and workshops, organized by IEC TISS (Technical Information and Support Services) and conducted by Jan-Henrik Tiedemann, IEC Community Business Coordinator, took place in Asia in May 2012. Four countries were selected: China, Singapore, Japan and Korea.

Southern China
The first training was in Shenzhen, a major city in the Guangdong Province, where most of the Chinese electronics industry is located and flourishing. The Chinese NC (National Committee), the provincial standardization office and the local industry cooperated closely to make this first event a success.

Two training sessions were organized, one open to the public and the other reserved for TC/SC (Technical Committee/Subcommittee) secretaries. The public session was a workshop addressing topics such as the IEC and its standardization and conformity assessment activities, the benefits of standardization for industry, national adoptions of IEC International Standards and so forth.

More than 350 participants, mainly from the Guangdong Province but also from other provinces attended the public session. Such a large audience showed that the need for standardization is clearly understood. The questions and comments at the end of the session gave a strong indicator that Chinese professionals are extremely keen to learn more about IEC International Standards and want to use them. They all expressed an interest in having further training. Many of the technical questions dealt with the electronics, battery and solar industry sectors.

Singapore
In Singapore, the training was for National Secretaries from SPRING, the Singapore NSB (National Standardization Body) and the IEC-APRC (Asia-Pacific Regional Centre) staff. The accent was put on new developments in IT Tools and other projects undertaken by TISS that will help the Technical Officers, editors and assistants in their work.

Japan
The one-day event in Tokyo, Japan, organized by JISC (Japanese Industrial Standards Committee), gathered about 30 TC/SC Secretaries, all highly-experienced people. As part of the workshop there was a brainstorming session on “How would you improve IEC electronic processes”? The feedback was valuable for IEC and very positive. Participants again expressed the need for regular training.

Korea
The last leg of the tour was in Seoul, Korea. The two-day event was broken down into two specific events. The first day was for experts who had little experience of standards and standardization work, the second for those who already knew about standards. About 40 participants, mainly from the

Participants in the workshop that took place in Tokyo, Japan

One of the training sessions held in Seoul, Korea

The training in Shenzhen, China, attracted about 350 participants
SMB (Standardization Management Board) has approved the nomination of Kobi Yahav as Israeli member of SMB SG (Strategic Group) 3: Smart Grid.

About Kobi Yahav

Kobi Yahav is no stranger to the Smart Grid sector, having headed the Smart Grid programme at Israel Electric Corporation for the past two-and-a-half years while also serving as head of the Smart Grid standardization committee at the Standards Institution of Israel.

Yahav holds a PhD in Industrial and Management Engineering from Ben-Gurion University and was involved in the implementation of the Distribution Management System in Israel, as head of the technical team.

Training and learning

In total, 7 workshops were conducted in 4 countries in 3 weeks. Each country has its specificities, and while providing training for local audiences, the IEC also learned much from the experience. Trainings and workshops have to be tailor-made for each audience because expertise, knowledge, expectations, needs and markets are widely different in each country.

Extensions of terms of office

SMB has also approved the extensions of terms of office of the following IEC TC (Technical Committee) Chairmen:

Andy P. Norris, sixth extension of term of office as Chairman of TC 80: Maritime navigation and radiocommunication equipment and systems

Gerd Weking, second extension of term of office as Chairman of TC 48: Electromechanical components and mechanical structures for electronic equipment

Nicholas E.F. Lycoudes, second extension of term of office as Chairman of TC 47: Semiconductor devices

Bernd Oswald, second extension of term of office as Chairman of TC 73: Short-circuit currents.

There is a definite need for more regular training workshops to bring a larger audience from industry onboard. This first set of training provided a wealth of information that will definitely be used when preparing future events.

The next sessions are scheduled for spring 2013 in North America and later in Europe, South America and Asia.

Latest nominations and extensions

New member to SMB SG 3 and extensions of terms of office

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Fighting product piracy
A new brochure provides anti-counterfeiting guidance

Earlier this year IEC published a new brochure, Piracy in electrical and electronic products: Anti-counterfeiting best practice and strategies. Prepared by CAB (Conformity Assessment Board), the publication provides an overview of the current situation concerning counterfeiting of electrotechnical products and provides concrete advice on tackling the issue.

A serious threat
Alarming is, electrical and electronic goods are the second most counterfeited products after pharmaceuticals. These often sub-standard products not only put individuals at risk but can also prove a huge financial liability when they enter manufacturing supply chains as they have not been tested and generally don’t comply with performance and safety specifications.

Counterfeit products negatively impact the economies of both the countries in which they are produced as well as those in which they are sold. Loss of foreign investment and taxes is experienced by countries with counterfeiting operations while countries in which counterfeit products are sold may suffer job losses, lost tax revenues and increased social costs due to death and injuries incurred by the products.

Tackling piracy
While a lot of effort goes into thwarting the production and sale of counterfeit products, it is just as important to increase awareness amongst consumers of the risks such products pose to themselves and their families.

The brochure enumerates some of the more important measures to be taken as part of any anti-counterfeiting strategy and provides tips for identifying counterfeit products. The names of national certification bodies and laboratories that participate in IEC CA (Conformity Assessment) Systems are also listed by country.

The brochure in your own language
In order to encourage NCs to publish versions of the brochure in their own language, we have prepared an InDesign template which you can request at: gh@iec.ch. Alternatively, you can provide us with the translated text and we will be happy to lay it out and upload to our website.

Counterfeit products have a negative impact on countries’ economies...

...and can pose a serious threat to individuals and manufacturers

The new brochure prepared by CAB provides anti-counterfeiting guidance.

English, Korean and French versions of the brochure are available at www.iec.ch/about/brochures/conformity_assessment
Ships are like floating cities: they produce and distribute their own electricity. They use auxiliary units that predominantly burn fuel oil to provide the necessary power when docked. Increasingly, ports are installing HVSC (High Voltage Shore Connection) systems to supply electric power to berthed ships to meet tighter harmful emission limits. This development will be helped by the publication of the first International Standard for HVSC systems.

Out of sight, out of mind – but still in lungs

Unlike airliners or motor vehicles, shipping is not seen by most people and levels of pollution from the shipping industry have long been underestimated. Ship engines burn bunker fuel. This petroleum product is basically what is left over after all the cleaner fuels have been extracted from crude oil. It has high sulphur content and its combustion results in excessive levels of SOx (sulphur oxide), NOx (nitrogen oxide) and PM (particulate matter); the last is particularly harmful.

A new International Standard initiated by IEC TC (Technical Committee) 18: Electrical installations of ships and of mobile and fixed offshore units, has just been published. It aims to cut ships’ emissions in ports.

Tighter emission control

The IMO (International Maritime Organization), the UN agency with special responsibility for the safety and security of shipping and the prevention of marine pollution by ships, has introduced international limits to the maximum sulphur content in bunker fuel in Annex VI of its International Convention for the Prevention of Pollution from Ships (MARPOL). This fixes limits on SOx and NOx emissions from ship exhausts. The maximum sulphur content of bunker fuel was set at 3.5% from 1 January 2012 until January 2020, with lower levels to be introduced later.

Some regions (Baltic, North Sea, North America, Caribbean Sea area) have introduced tighter limits in so-called Emission Control Areas (ECAs).

Cutting emission and noise in ports

If ships auxiliary generators used to provide electric power to docked ships do not burn bunker fuel but cleaner fuels, SOx, NOx, and PM are still emitted. During a 10-hour stay in port, the diesel engines of a single cruise ship burn around 20 tonnes of fuel, producing some 60 tonnes of CO2.

On average, ships spend 100 days a year in port, using several tonnes of fuel a day to power ancillary systems. Ports are often located in densely populated cities and the environmental impact on the local population may be severe.

Cutting noxious emissions in ports has become a priority worldwide and has led to the introduction of OPS (onshore power supplies), which allow ships to shut down their diesel engines and connect to the land-based grid while they are docked.

Another advantage of HVSC is that it reduces noise and vibration from ships. Crews, dockside workers and nearby residents all benefit from this reduction.

Not new, yet no single standard

Providing electric power from shore to ships at berth is not a recent development; in fact the term commonly used to describe it, “cold ironing”, dates back to the time when ships had coal-fired engines that were allowed to go completely cold when in port, as power was supplied from shore.

Navy ships, which on average stay in port much longer than commercial ships, make extensive use of cold ironing. The US Navy, for instance, has been using it for several decades and has developed a unique electrical cable connection system to avoid compatibility issues when calling at different ports.

Generally speaking, first-generation OPS systems operate on low voltages (400-690 V). More recently, high voltage (6-11 kV) has become the standard.

The need for HVSC standards

Currently over 20 ports in North America and Europe implement HVSC but systems across the world are not interoperable, owing to the lack of standardization and differences in system frequency (60 Hz in North America, 50 Hz in Europe and most of Asia), voltage and structural design.

Port Metro Vancouver, one of around two dozen ports in the world to have introduced HVSC, cut its greenhouse gas emissions by 3 000 tonnes in 2010 after installing HVSC for cruise ships.

Voltage levels differ between ports and electrical frequencies and power requirements also vary among vessel
categories and sizes. Ocean-going vessels calling at European ports tend to have more 60 Hz electrical systems on board. Peak power demand varies from 1 MW (for container vessels smaller than 140 metres) to 11 MW (cruise ships over 200 metres).

These different systems and the specific local situation determine whether or not frequency converters and/or on-board transformers are needed and may affect the overall cost of an OPS system for port authorities and ship owners.

**First International Standard for HVSC published**

In 2009, IEC TC 18 issued a PAS (publicly available specification) giving requirements for HVSC systems.

This PAS was prepared in consultation with IEC TC 20: Electric cables, and IEC SC 18A. It was further developed into an International Standard in cooperation with IEC SC 23H: Industrial plugs and socket-outlets, ISO TC 8: Ships and marine technology, and the Institute of IEEE (Electrical and Electronics Engineers) PCIC (Petroleum and Chemical Industry Committee).


It describes HVSC systems on board ships and on shore and defines “requirements that support, with the application of suitable operating practices, efficiency and safety of connections by compliant ships to compliant high-voltage shore power supplies through a compatible shore to ship connection”.

It is intended to allow different ships “to connect for as long as practicable during stays in port. Ships that do not apply this standard may find it impossible to connect to compliant shore supplies”.

**Comprehensive features**

To meet these demands IEC/ISO/IEEE 80005-1 addresses:

- HV shore distribution systems
- shore-to-ship connection and interface equipment
- transformers/reactors
- semiconductor/rotating converters
- ship distribution systems
- control, monitoring, interlocking and power management systems

The standard tackles important safety aspects such as emergency shut downs (ESD), when the ship moves outside the range of permissible motion forward, aft or outward from the dock, and special provisions that are applicable to ESD at LNG (liquefied natural gas) terminals.

The standard also lists additional requirements for RoRo (roll-on/roll-off) cargo and passenger ships, cruise and container ships, tankers and LNG carriers. The relevant IEC, ISO and IEEE committees have approved a new work proposal for a second International Standard for HSVC, to cover the communication interface description.

**Gathering momentum**

From an environmental perspective, the use of HSVC is compelling. Compared to low-sulphur marine gas oil used in EU ports, onshore power supply cuts NOx, PM and volatile organic compound emissions by 94%, 89% and 94%, respectively.

Tighter environmental regulations incite more and more ports to put in HVSC systems. In addition to the more than 20 ports in Europe and North America that currently have operational HSVC systems, others are starting or planning to install them. The new IEC/ISO/IEEE International Standard should help drive that wider adoption.
ME (medical electrical) equipment and systems play an increasingly important role in healthcare. Safe operation and performance are central to the management of risks in the medical environment for patients and staff alike. IEC TC (Technical Committee) 62 and its SCs (Subcommittees) prepare International Standards for this area of technology.

Ground-breaking International Standard
SC 62A: Common aspects of electrical equipment used in medical practice, has just published the consolidated version of IEC 60601-1: Medical electrical equipment – Part 1: General requirements for basic safety and essential performance. This publication follows closely the release of Amendment 1 to this International Standard in July (see article in e-tech).

As the object of IEC 60601-1 is to specify general requirements, it serves as the basis for standards that cover the whole range of ME equipment and systems: from equipment for radiotherapy, nuclear medicine and radiation dosimetry to electromedical equipment used to diagnose and monitor patients, to name just a few.

This International Standard details general and test requirements; the classification, equipment identification, marking and documentation of ME equipment and systems; protection against electrical and mechanical hazards, unwanted and excessive radiation hazards, excessive temperatures and other hazards from ME equipment and systems.

It also provides information on PEMS (programmable electrical medical systems) and advice to manufacturers about addressing the risks associated with the accuracy of controls and instruments.

The 60601 family
IEC 60601-1 has been prepared by SC 62A, which is part of IEC TC 62: Electrical equipment in medical practice.

In addition to the IEC 60601-1 series, which are the umbrella safety standards for ME equipment, TC 62 and its SCs prepare the IEC 60601-2-xx series of safety and performance standards for specific types of ME equipment and the IEC 60601-3-xx series of performance standards for individual types of ME equipment.

In the IEC 60601 series, some International Standards may modify, replace or delete requirements contained in IEC 60601-1, as appropriate for the specific piece of ME equipment under consideration, and may add other basic safety and essential performance requirements.

Specific requirements for ME equipment
The original IEC approach was to prepare separate basic safety and performance International Standards for ME equipment. This was a natural extension of the approach historically taken with other electrical equipment standards at national and international levels. In those cases, basic safety is regulated through mandatory standards but other performance specifications are regulated by market pressure.

However it is now recognized that separation of these two factors is somewhat inappropriate in addressing the hazards that result from inadequate ME equipment design. For many items of such equipment, this cannot be the right approach to take: responsible organizations have to depend on standards to ensure essential performance as well as basic safety.
Consolidated version puts user convenience uppermost
This edition has been significantly restructured. Requirements in the electrical section have been further aligned with those for information technology equipment covered by IEC 60950-1 and a requirement for including a risk management process has been added.

The technical content of this consolidated version is identical to that of the base (2005) publication. The new version consists of the 2005 edition and Amendment 1 plus the corrigenda of December 2006 and 2007. It bears the edition number 3.1 and optimizes user convenience. A vertical line in the margin shows where the base publication has been modified by Amendment 1. Additions and deletions are displayed in red, and deletions are struck through. This consolidated version is available in English now from the IEC webstore. The French version will follow shortly.

Consolidated versions and FDIS (Final Draft International Standard), which are pre-release documents available during the approval stage, are two of the Value Added Products derived from official publications that are available through the IEC webstore.
Lighting

Issue 08/2012 of e-tech will focus on various issues and technical aspects in relation to lighting.

Lighting is a major source of electricity consumption: around a fifth of all global electricity generation is used for lighting. With more people gaining access to the grid and lighting this share could be rising, generating more CO₂ unless drastic measures are adopted.

But lighting as we have known it for more than a hundred years presents some challenges. Not many inventions last for more than 100 years without major modifications incandescent light bulbs are one. But they are very inefficient, converting only about 5% of the energy they receive into light. Global bans on their sale and the phasing in of energy-efficient lights, such as compact fluorescent and LED-based solutions, appears to be an attractive proposition and forms part of many governments’ strategies to limit energy consumption.

The lighting industry represents also a major economic factor. According to a September 2012 Global lighting maker Philips expects the world’s lighting market to expand four fold between now and 2020, in a study published in September 2012. LED lighting systems will represent around half of the market by 2020.

However, proper International Standards are necessary to underpin this expansion and ensure the relatively new types of energy-efficient lights meet satisfactory requirements in terms of lighting as well as lifespan and safety.