



MULTIMEDIA & APPLIANCES

INDUSTRY SPOTLIGHT

The smart home

Multimedia and appliance
interconnectivity

TECHNOLOGY FOCUS

Thinner screens

Technological advances

CONFORMITY ASSESSMENT

Explosive atmospheres

IECEx International Conference
in Dubai





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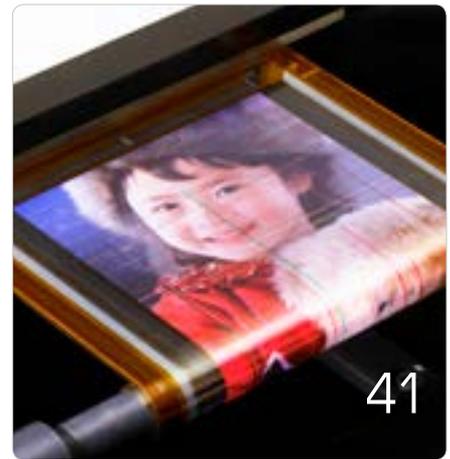
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Editorial

Computing power everywhere



Claire Marchand,
Managing Editor e-tech.

Today the lines between computing, entertainment and home appliances are blurring. All of them are smart, networked and interconnected.

A smart home features highly advanced automatic systems for lighting, temperature control, multimedia, security, window and door operations, energy consumption tracking and many other functions. Its computer system can monitor and even perform many of the tasks that used to necessitate human intervention.

As digital content becomes available on countless platforms through convergence, audio-visual, multimedia, information and communication technology are becoming ever more present, nearly everywhere. International Standards, and collaboration between the many organizations that work on them, makes this harmonization possible. The IEC, through several of its Technical Committees, has worked to prepare International Standards for audio, video and multimedia systems and equipment, for electronic display devices, for cables and connectors, and a myriad of other components used in these systems.

The IEC works closely with many organizations preparing standards for these systems to avoid duplication. Hollywood granted a Primetime Emmy Engineering Award in 2008 and a Technology and Engineering Emmy Award in 2009 to the IEC, ISO (International Organization for Standardization) and the ITU (International Telecommunication Union) for their work in producing the advanced MPEG-4 AVC video coding standard. These awards are evidence of the benefits of collaboration in standardization work and of the international recognition it attracts.



The IEC, ISO and ITU received Emmy Awards for their work in producing the MPEG-4 AVC video coding standard



A smart home computer system can monitor the whole house

Get involved

IEC TC 49 outreach event in Singapore for increased participation

With the rapid growth of manufacturing of electronic devices in South East Asia, IEC TC (Technical Committee) 49: Piezoelectric, dielectric and electrostatic devices and associated materials for frequency control, selection and detection, has embarked on a pro-active outreach programme to IEC NCs (National Committees) and manufacturers in the region to inform them of the benefits of participating in IEC work

Piezoelectricity is the charge that accumulates in certain solid materials (notably crystals, certain ceramics and biological matter such as bone) in response to applied mechanical stress. Piezoelectricity is found in applications such as the production and detection of sound, generation of high voltages, generation of electrical signals with specified frequencies, microbalances and ultrafine focusing of optical assemblies. It also acts as an ignition source for cigarette lighters and push-start propane barbecues.



University of Michigan Piezoelectric Energy Harvester (Photo: Erkan Aktakka)

Key components

Piezoelectric, dielectric and electrostatic devices for frequency control, selection and detection, such as resonators, filters, oscillators and sensors, are key components in various pieces of electrical equipment. A quartz clock uses piezoelectricity, as does any cigarette lighter without a flint, and the charge that is generated is converted into an electrical frequency signal. Medical ultrasound devices create high-frequency acoustic vibrations using piezoelectric crystals. Piezoelectric devices are used in vehicles

to control engines and audio systems and in aircraft attitude control systems. Loudspeakers use piezoelectricity to convert incoming electricity to sound.

Indispensable for communications. Rapidly evolving technologies and the spread of broadband and mobile communications have increased the need for higher frequency devices. Mobile phones are a good example. They require electrical components such as TCXO (temperature-compensated crystal oscillators), quartz resonators and SAW (surface acoustic wave) filters and duplexers. These are used for frequency control and selection.

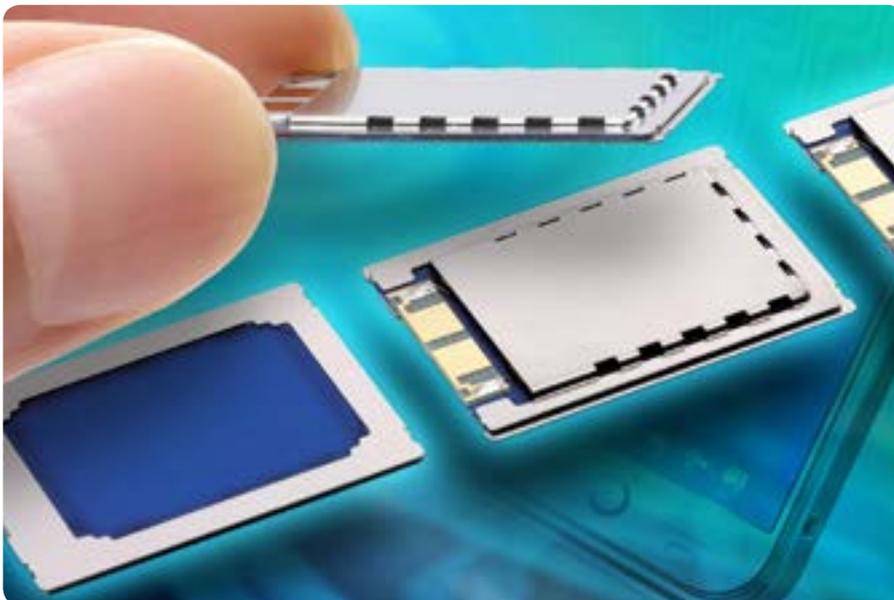
In broadband high-end communication systems, a variety of frequency control and selection devices including VCXO (voltage-controlled crystal oscillators) or OCXO (oven-controlled crystal oscillators), dielectric filters and SAW filters are utilized as components. They offer attributes such as low noise, frequency stability, low loss and small size.

Making life easier

New technological developments have also brought better human-interface methods. As a result, wireless radio applications and sensing systems have become much more important in applications such as automobiles, robots or home automation. In short, the electronic industry cannot meet today's needs and expand into the future without piezoelectric, dielectric and electrostatic devices for frequency control, selection and detection.

TC 49 regional outreach

The IEC TC 49 portfolio of publications plays an essential role in the B2B (business to business) commerce of piezoelectric devices, for example specifying standardized packaging and test methods for evaluating ageing.



Waterproof piezoelectric speaker (Photo: Murata, Japan)

The Singapore event brought together a total of 30 participants from IEC NCs and manufacturers from China, Indonesia, Japan, Malaysia, Philippines, Singapore and Thailand.

The event was organized by the Japanese Mirror Committee of IEC TC 49, supported by METI, the Japanese Ministry of Economy, Trade and Industry, and hosted by the IEC-APRC (Asia Pacific Regional Centre).

Keeping pace with changing market demands

The technical and market environment in which IEC TC 49 operates was covered by its Secretary, Dr Toshihiro Kojima. In his presentation, he illustrated the multitude of applications of piezoelectric devices covering wired and wireless communications, multi-media equipment, personal computers and automotive electronics, with 50 to 60 applications of crystal devices in some high end models.

Dr Kojima then highlighted the evolution of activities since the creation of the technical committee in 1960.

Future developments

Finally, future potential applications for piezoelectric devices were identified in EVs (electric vehicles), new wireless communication systems such as Cognitive Mobile Communications and ITS (Intelligent Transport Systems), all of which will necessitate the use of IEC International Standards. Current and future potential developments strongly reinforce the need for increased participation in IEC TC 49 standardization work from South East Asian countries.

Challenges for the mobile communication market

The key note presentation was given by Kunihiro Kawai of NTT DoCoMo, the premier Japanese provider of leading-edge mobile voice, data and multimedia services. He illustrated the rapid growth of the mobile communication market, the current use of piezoelectric devices and NTT's R&D vision addressing these future challenges. He concluded



Participants in the TC 49 seminar

with the company's expectations for piezoelectric, dielectric and MEMS (Micro-ElectroMechanical Systems).

IEC TC 49 has recently established a new WG (Working Group) 12: MEMS devices for frequency control, selection and detection. These new devices provide the potential for improved integration with other components in the product.

Masako Tanaka of Seiko Epson Corp, one of the world's largest manufacturers of computer printers, information and imaging related equipment, and Convenor of IEC TC 49 WG 9: Enclosures and related technology, underlined the use of quartz crystal TDs (timing devices) in tablet personal computers, mobile communications and automotive applications, highlighting the rapid market growth and future market/customer needs for improved performance.

The IEC and International Standardization

The remainder of the presentations focused on several IEC-related issues. Shigeyasu Hatsuyama of METI talked about the role and need for global and national standardization. Lee Toon Huat, of SPRING, the Singapore national standards and accreditation body that hosts the Singapore IEC NC, presented the structure of an IEC NC with its national mirror committees and criteria for participating directly in IEC technical committee and sub-committee work. Dennis Chew of IEC-APRC described the IEC structure and how it operates and finally

Dr Michael Casson of IEC Central Office explained the development process for IEC International Standards and IEC deliverables.

A valuable experience

Amran Abdul Manaf from Malaysia found the seminar a very valuable experience: "The seminar was conducted at the IEC Asia-Pacific Regional Centre itself, where we can get a lot of information related to IEC activities, and also guidance on how to participate in developing International Standards for our own company's benefit".

The participants obtained a clear overview of the current and future activities of IEC TC 49, showing the important role that IEC standardization plays in this market and the benefits of active participation.

IEC TC 49 scope

To prepare international standards for piezoelectric, dielectric and electrostatic devices for frequency control, selection and detection, such as resonators, filters, oscillators, sensors and their related products (excluding those piezoelectric transducers dealt with by TC 29: Electroacoustics, and TC 87: Ultrasonics, and active devices dealt with by SC 47F: Micro-electromechanical systems) and for associated materials.

Building trust

When standards open consumer markets

IEC Global Visions recently interviewed Dr Zida Yu, CTO (Corporate Technology Officer) Haier Group, which is today the biggest white goods manufacturer in the world. Yu shares why the company's active participation in IEC work is their most efficient tool for building trust among customers and the distribution network and helps them to open new markets faster. Haier participates actively in 8 TC/SCs (Technical Committees and Subcommittees).

Leading energy efficiency efforts

To stay on top of energy regulations in all regions and to develop innovations that give it an edge in this space, the company has put in place relevant design, manufacturing, operation and recycling processes. During design, all relevant energy efficiency standards are taken into account so that the final product is able to meet and exceed local regulations. In manufacturing, machines and processes are continuously upgraded so as to reduce energy consumption. In operation, the company has put in place control systems that allow it to monitor its performance and

progress in this area. Last but not least, the ability to recycle optimally at the end of its useful life is built into the product from the very start.

A systems approach and the ability to connect

Increasingly Haier's efforts go beyond individual products; the company is now building the "intelligent" home, by connecting products into systems that will enable consumers to stay connected with the world and their home, wherever they are. Connecting consumers in this way also implies that companies are able to cooperate with others; that their products are able to interconnect. Today, no company can build everything a consumer needs on its own. This is one of the reasons why Haier participates in IEC work.

Building trust...

Haier is a global company and its participation in the IEC helps it to build trust not only with its direct customers but also with consumers. Yu is convinced that Haier's customers understand and believe in the inherent quality that is built into IEC International Standards: "participating in the IEC is the best and quickest way for us to introduce products

to global consumers; it is also the best way for any company to demonstrate the quality of its products and gain the trust of its industry chain, distributors and wholesalers."

...and markets faster

Haier actively participates in the standard setting activities of all IEC TC/SCs (Technical Committees and Subcommittees) that directly impact its product lines, including home laundry, refrigerators and other household appliances, audio, video and multimedia systems as well as information technology equipment. Yu underlines that one important reason for this is that the company wants to be aware of new standards; to be able to design products that comply with those standards as soon as they are published so as to stay ahead of the market. Yu believes: "the IEC can help Haier open new markets. When a company works in accordance with IEC Standards, its products will be quickly accepted by consumers."

Yu says that through his personal involvement in the IEC he has learned a lot from his international peers and the company's development of new technologies has also benefited.



Haier

Haier is the world's largest white goods manufacturer and one of China's Top 10 Global Brands. In 29 manufacturing bases, eight R&D centres and 19 overseas trading companies worldwide, Haier employs more than 60 000 people globally. Additionally, the company has established a marketing, logistics and service network that includes shops, franchised stores and after-sale service centres in China and abroad.

Electrical energy efficiency certified

New IECEE service is fully operational

How many electrical appliances and devices do we rely on in any one day? From the lights that we switch on, to the hair dryer, oven and television at home and the computer in the office, most of the tasks we accomplish require the assistance of electrical devices. And then there are the appliances that run 24 hours a day, seven days a week: refrigerators and heaters, for example

Smarter and more efficient

We are surrounded by electrical equipment but we are always on the lookout for new devices that will lighten the burden of our domestic chores and make life easier. The temptation is even greater today, with the emergence of appliances that are smart, interconnected and energy efficient. We may have twice as many electrical appliances as we had 15 or 20 years ago, and yet our electricity bills are lower.

Huge progress has been made in recent years in the development and manufacture of appliances and equipment that consume much less energy than was the case when energy saving wasn't a pressing issue. Today's appliances often consume less than half of the electricity they would have used in the past, despite the new products' many added features.



Smart home control screen



Daily energy consumption monitoring

Major benefit for the consumer

Improving the energy efficiency of household appliances and equipment saves money, reduces emissions and can also improve productivity. Many countries have developed, or are developing, strategies for energy savings and emissions reduction from appliances and are passing legislation to that effect.

Energy efficiency through IEC Standards...

Standards can serve as the basis for regulations and legislation in the energy efficiency field. The IEC has a whole catalogue of International Standards that deal not only with safety requirements for appliances and equipment, but also provide metrics and testing specifications to achieve optimum energy consumption.

Manufacturers of appliances and equipment for domestic use can rely on IEC International Standards to develop state-of-the-art products that meet the strictest safety and energy-efficiency

requirements. Going a step further, they can rely on the IECEE, the IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components, to have their products tested and certified.

...and certification

IECEE has been testing and certifying appliances and equipment for many years, focusing on product safety and, when the standards require it, also providing services covering aspects of performance. Now, in response to industry demand, IECEE has introduced a new product category for energy efficiency.

New IECEE service

IECEE has identified a number of IEC International Standards for a variety of appliances – from refrigerators, washing machines and tumble dryers to vacuum cleaners, irons, coffee makers, fans and microwave ovens, to name but a few – that will serve as a basis for testing the products' energy efficiency performance.



Heaters are part of the list of products tested and certified by IECEE

This service will provide a Test Report issued by a IECEE CBTL (Certification Body Testing Laboratory) and validated by a STR (Statement of Test Result) that is issued by an IECEE NCB (National Certification Body). It can be used either as a stand-alone or as a combined safety and energy efficiency/performance service where the Test Report and the STR are included in the CB Test Certificate or the FCS (Full Certification Scheme) Certificate that is issued by the IECEE NCB.

About IECEE Schemes

IECEE facilitates access to market

A CB Test Certificate is a global passport that allows products to be accepted in all IECEE member countries. It is so well known that global acceptance is a reality, even in countries that are not part of the IECEE community. "One test, one international certificate" opens the doors of the global market.

CB Scheme

The IECEE CB Scheme provides the assurance that tested and certified

products meet the strictest levels of safety, reliability and performance in compliance with the relevant IEC International Standards. It helps reduce costs and time to market, eliminates duplicate or multiple testing and offers a high level of confidence for manufacturers, retailers and consumers alike.

CB-FCS

The CB-FCS Scheme for Mutual Recognition of Conformity Assessment

Certificates for Electrotechnical Equipment and Components is an extension of the IECEE CB Scheme in that it also includes factory audits and inspections. It goes far beyond product testing and includes a complete quality system and surveillance methods at the factory that manufactures a certified product. This is interesting for manufacturers who need to provide proof that products manufactured in a given factory offer a consistent level of quality over time.

A first for Dubai and the Middle East

IECEEx international conference addresses overall safety in Ex field



The oil and gas industry makes a large contribution to the financial well-being of middle-eastern economies. All countries in the region have huge oil and gas



resources. Oil producing and processing operations are well established, and the gas industry sector is expanding rapidly. This also means that a great number



of people are employed by oil and gas companies, either directly on the production and processing side of the business or in repair and maintenance.

Because it is governments' role and duty to protect their people, authorities in the region have looked at ways of ensuring the highest levels of safety for workers, installations and equipment. This led them to express a keen interest in IECEx, the IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres.

ESMA, the Emirates Authority for Standardization & Metrology, took the initiative and approached IECEx with a view to organizing an event that would help educate interested parties about the System and learn how the region can benefit from it.

The conference

Organized by the IEC and IECEx, together with ESMA, and in conjunction with UNECE (United Nations Economic Commission for Europe), the 2012 IECEx International Conference will take place in Dubai on 20-21 March 2012.

World experts share experience and knowledge

The conference will bring together experts from all over the world, involved in the international standardization, equipment manufacture, inspection, repair and overhaul of Ex equipment and systems, and the assessment and certification of personnel competence. Issues concerning requirements and regulations in the GCC (Gulf Cooperation Council) region will also be covered.

Through their presentations and direct contact with participants, these experts will be able to share their experience and detailed knowledge of all matters pertaining to the Ex field, such as plant design, principles and practical applications of area classification, installation and repair in compliance with IEC International Standards. They will answer questions, provide advice and give valuable information to anyone involved in the Ex sector.

In addition to His Excellency Rashid Ahmed Bin Fahad, Minister of UAE



Dubai hosts the 2012 IECEx international conference

Environment and Water, and Mohammed Saleh Badri, Acting Director General of ESMA and President of the IEC National Committee of the UAE, the speakers include world-renowned officers and experts of IECEx and IEC TC (Technical Committee) 31: Equipment for explosive atmospheres.

For the complete list of speakers and their biographies, please go to the dedicated conference section on the IECEx website: <http://www.iecex.com/dubai/speakers.html>

Highlights of the programme

As the date of the conference approaches fast, the programme is taking form and the speakers have been announced.

The programme includes presentations on the IECEx System and its three schemes covering:

- IECEx Certified Equipment
- IECEx Certified Service Facilities (Ex Repair Workshops)
- IECEx Certification of Personnel Competence (CoPC)

as well as a user's perspective on the system and why it is useful for the oil and gas industry. In addition, several technical

presentations will be given aimed at providing practical advice on the day to day issues surrounding:

- Area Classification
- Installation and Inspection
- Ex Repair practices

Another address will focus on national or regional Ex verification or approval systems, e.g. ATEX, and how the use of IECEx facilitates such approvals in addition to providing international certification.

Current regulations and requirements governing equipment and service providers to Ex areas, such as oil and gas installations in the GCC region, will be outlined.

The UNECE will present the conclusions of its global study into regulations for the Ex field and their findings and publication of the new "Common Regulatory Framework for Equipment used in Environments with an Explosive Atmosphere".

An update concerning IEC International Standards covering explosive atmospheres and a detailed explanation of area classification are also on the agenda.

An open forum will offer all attendees the opportunity to raise questions concerning Ex aspects and IECEx and to consider an industry position concerning Ex and IEC TC 31 Standards and IECEx.

High profile

Given the high profile and importance of the theme and the involvement of the United Nations through UNECE, this International Conference is a sponsored event with free-of-charge attendance for

registered delegates. The two-day event includes a hosted dinner for all delegates on the evening of the first day.

Get involved

For more information on the IECEx international conference, including registration, go to: www.iecex.com or send an email to: info@iecex.com

Participate in the IEC group on LinkedIn: <http://www.linkedin.com/groups?most>

[Popular=&gid=2725372](#) and join the IECEx subgroup: <http://www.linkedin.com/groups?gid=4241618>

Follow the IEC on Twitter: <http://twitter.com/IECStandards>

And on Facebook: <https://www.facebook.com/InternationalElectrotechnicalCommission>

IEC and IECEx work in the Ex field

The IEC has long been involved in developing International Standards for equipment used in hazardous areas. Set up in 1946, IEC TC 31: Equipment for explosive atmospheres, has a complete series of International Standards that cover all specific requirements for Ex equipment and systems, from general requirements to protection levels for apparatus used by all sectors that operate in hazardous environments, such as oil refineries, offshore oil rigs, gas plants, mines, sugar refineries, flour mills, grain silos and the paper and textile sectors.

Rather than a single industry, Ex is part of just about every industry sector known to man. Ex has embraced IEC International Standards. But producing equipment based on Ex standards is not enough. Most manufacturers, suppliers

and end-users trade on the global scene and have to meet the very strict requirements put in place by national regulations and legislation. Proving adherence to those requirements can be costly and time-intensive.

As a way to ensure compliance with its International Standards, the IEC established IECEx, the IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres.

Since its inception in 1996, IECEx has put in place a number of Schemes that provide assurance that equipment and systems are manufactured and operated according to the highest international standards of safety:

- Equipment – the IECEx Certified Equipment Scheme

- Services – the IECEx Certified Service Facilities Scheme (e.g. repair and overhaul)
- Personnel competence – IECEx Certification of Personnel Competence Scheme (CoPC)

Through more than 50 IECEx approved ExCBs (Ex Certification Bodies) in 30 countries, IECEx certification has become the world's single best practice for demonstrating compliance with International Standards. Its credentials include acceptance by end-users and also the recent formal endorsement by the United Nations, through UNECE, as the recommended model for regulating the safety of equipment and persons working in areas where the potential for an explosive atmosphere may exist.

LEDs for Ex

IECEx-certified lighting fixtures for hazardous areas

Offshore oil platforms, refineries, shipyards, gas and oil tankers operate 24 hours a day. Most human activities may go at a reduced pace at night but the tanker will continue to trace its route across the ocean, the rig will continue to drill or pump oil, and refineries never stop refining crude oil. Night-shift crews need powerful and reliable lighting to be able to work when it is dark. Lighting fixtures, as with any other piece of equipment or device used in hazardous areas, have to be explosion-proof.

A growing trend

A growing trend for lighting fixtures designed for explosive environments is to replace conventional incandescent light bulbs, HDL (high-intensity discharge) or fluorescent lighting with LEDs. The benefits of using LEDs are numerous. Low voltage and low-operating temperatures make them safer to use in combustible atmospheres, excellent colour rendition improves night vision, instant switch-on provides added safety when entering dark areas. Because they last much longer than traditional lighting, they also reduce drastically the need for maintenance. And, last but not least, they consume much less energy than all the other types of light fixture.

From floodlights to lifebuoys

LEDs can be used for all types of offshore lighting: from floodlights to exit signs, from berth and bunk lighting to linear lighting mounted on walls or floors for interior areas.

The risk factor is high for those working in harsh and extreme conditions. In case of an accident, their survival often depends on being detected as quickly as possible. Hence the importance of having safety kit they can rely on at all times. That is

why lifebuoys and lifejackets are also equipped with powerful and explosion-proof LED lights.

Ex tested and certified

Companies such as Dialight and Hubbell, which offer high-specification LED lighting for hazardous areas, as well as the more conventional incandescent light bulbs, HDL or fluorescent lighting, have had their products tested and certified by IECEx, the IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres.

One UK-based company, Daniamant, which specializes in lifebuoy and lifejacket lights, also has a range of products for explosive environments that are IECEx-certified

and comply with three IEC International Standards:

- IEC 60079-0, *Explosive atmospheres - Part 0: Equipment - General requirements*
- IEC 60079-11, *Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"*
- IEC 60079-26, *Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga*

For Daniamant, as for all other companies producing lighting equipment for hazardous areas, having IECEx certification is essential for providing global access to markets and to avoid having to obtain individual approvals for each country.



Oil rigs operate 24 hours a day, 7 days a week



Lifebuoy lights...



...and lifejacket lights facilitate detection in case of accidents at sea (Photos: Daniamant)

Smaller, smarter, safer

IECQ: the best tool for electronic component certification

Smart is the word. Appliances, multimedia equipment, security systems are all becoming more sophisticated, making life much easier and safer. All these devices and systems would not exist without electronic components. To accompany the rapid technological developments of recent years, electronic component manufacturers have been designing products that are smarter, smaller and offer enhanced performance and functionality.

Electronics inside

Sensors, connectors, resistors, capacitors, semiconductors, diodes, LEDs (light-emitting diodes), OLEDs (organic LEDs) and MEMS (micro electromechanical systems) are just some of the numerous components that are widely used in appliances and multimedia equipment. For them to work smoothly, they have to have high-quality electronics inside. One faulty component can have disastrous effects.

IECQ ensures product safety and reliability

Electronic component manufacturers and suppliers have a very powerful tool at their disposal to ensure that their products are safe, reliable and meet the strictest requirements: IECQ (the IEC Quality Assessment System for Electronic Components) testing and certification.

As a worldwide approval and certification system covering the supply of electronic components, assemblies and associated materials and processes, IECQ tests and certifies components using quality assessment specifications based on IEC International Standards.

The numerous types of electronic component covered by IECQ are used in all kinds of technologies, from the smallest

device to the most complex piece of equipment. At present, there are eight families of components certified by IECQ:

- active components, including integrated circuits
- electromagnetic components
- electromechanical components
- electro-optic components
- hybrid integrated circuits
- passive components
- printed boards
- wires and cables

In addition, there are a multitude of related materials and processes that are covered by the IECQ schemes.

Hazardous substances: Facilitating proof of compliance

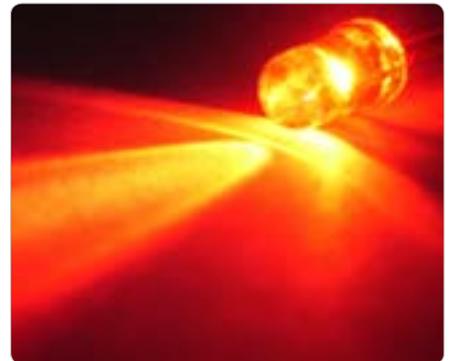
Concern for the environment and the need to eliminate hazardous waste prompted IECQ to devise a new scheme to help electronic component suppliers prove that their products comply with requirements to be free of hazardous substances.

Since the launch of the programme in 2005, the IECQ HSPM (Hazardous Substances Process Management) scheme has grown tremendously. Many countries have passed legislation restricting the use of hazardous substances in electrical and electronic products. The European Union's RoHS (Restrictions of Hazardous Substances) in electrical and electronic equipment and WEEE (Waste Electrical and Electronic Equipment) directives took effect in July 2006 and are currently being revised.

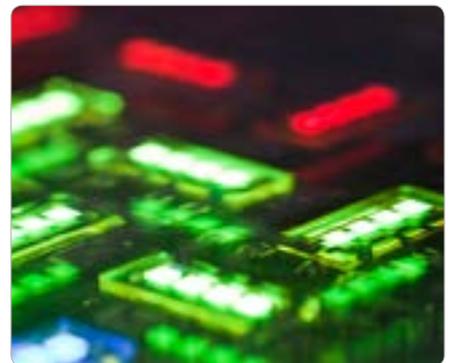
Through IECQ HSPM certification, electronic component manufacturers and suppliers can demonstrate that their electrical and electronic components and assemblies meet hazardous-substance-free specific local, national and international requirements.



Smart sensors (Photo: Electromate)



Ultra bright red LED



Red, green and blue OLEDs with an active surface area of 2x2 millimeters, being tested for performance (Photo: Deutscher Zukunftspreis/Ansgar Pudenz)

In the same way, manufacturers of home appliances and multimedia equipment who use electronic components that bear IECQ HSPM certification can advertise their products as free of all hazardous materials.

Competitive edge

All IECQ certificates are recognized in all IECQ member countries and beyond, thus helping to reduce costs and time to market and eliminating the need for multiple testing.

Obituary

Geoff Alstead, former IEC TC 56 Chairman dies

On 16 December, the Secretary of IEC TC (Technical Committee) 56: Dependability, Mick Maghar, announced the death of the committee's former chairman, Geoff Alstead, who died peacefully at home with his family after a long illness. On behalf of the entire committee, Maghar passed on condolences to Geoff's wife, Judith, telling her that Geoff would be sorely missed.



Geoff Alstead

Former IEC TC 56 Chairman

Indeed, the May 2011 *e-tech*, reporting various nominations of officers within IEC Consultative Committees, stated that SMB (Standardization Management Board) had approved the nomination of Geoff Alstead to a third term on ACOS (the Advisory Committee on Safety). Geoff continued working as Convenor of IEC TC 56 AG 7, the TC Strategic Advisory Group for as long as his health would allow him. Geoff had previously served as Chairman of TC 56 from 1996 until 2007 and was head of the UK delegation for a number of years.

ACOS deals with safety matters that are not specific to a single TC. Its task is to guide and coordinate IEC work on safety matters to ensure consistency in IEC safety standards. Reporting to the SMB, ACOS assigns horizontal and group safety functions to TCs to ensure this consistency.

Throughout his career as an expert on International Standards, Geoff worked hard to ensure that the concept of *dependability*, the ability of a system to perform as and when required to meet specific objectives, was understood by experts and those working with standards on an international basis. He carried

out training sessions, holding seminars to show the benefit of International Standards in promoting trade on “equal and transparent terms” while reducing risks and transaction costs.

Geoff made sure that the connotation of dependability was applied throughout the life-cycle of a product or system in a cost-effective manner so that it was managed right from conception up to its obsolescence.

Speaking about him personally, Eric Mahy, Convenor of TC 56/ MT (Maintenance Team) 9, which is responsible for revising IEC 60300-3-3, *Dependability management – Part 3-3: Application guide – Life cycle costing*, and a member of TC 56/MT 11, WG 3: Dependability management and WG 4: System aspects of dependability, said: “Geoff and I first met professionally in the early ‘80s, when he asked me to become involved in Life-Cycle Costing.

“I shall miss his wise counsel and his quiet opinion, as well as the pleasure of his company in TC 56”, concluded Mahy.

Nominations this month

Varied experience brings diversity

In addition to their broad industrial knowledge, two of the nominated IEC officers who are due to take up their term of office in January and February 2012 have a background in academia.

SMB SG 1: Energy efficiency and renewable resources

SMB (Standardization Management Board) approved the nomination of Jun-Young Choi, a Mechanical Engineer with a PhD from Yonsei Graduate School, Korea, as the Korean IEC NC (National Committee) alternate member to SMB SG (Strategic Group) 1 where he is replacing Jeha Kim. At present, Choi works for the Energy Technology Centre, Korea Testing Laboratory. In 2006, Choi was a guest researcher in the LBNL (Lawrence



Jun-Young Choi

Berkeley National Laboratory) of the US Department of Energy and Adjunct Professor of Mechanical Engineering at the Korea Polytechnic University.

Choi has an impressive track record of developing energy efficiency S&L (standards and labelling) programmes for household appliances and systems such as air conditioners, refrigerators and dishwashers, relevant performance testing equipment, energy efficiency standards and labelling programmes. His experience will be invaluable in the context of SMB SG 1, which deals specifically with energy efficiency and renewable resources.

SMB DMT: Directives Maintenance Team

SMB approved the first extension to the term of office for Carlo Masetti of Italy as DMT (Directives Maintenance Team) member from 2012-01-01 to 2014-12-31.

Carlo Masetti is currently Director of Institutional and International Affairs at CEI (Comitato Elettrotecnico Italiano), the Italian Electrotechnical Committee. He is also Vice President of CENELEC (European Committee for Electrotechnical Standardization), a position he has held since June 2009.

Masetti has broad experience in European and International Standardization, having served in the past as Italian Permanent Delegate on the CENELEC Technical Board and as Italian Member in the IEC SMB. He has also been an alternate member of the

SMB SG 1, so has an excellent understanding of energy efficiency and renewable energies. Masetti holds a degree in Electrical Engineering from the University of Rome and a Masters Degree from McGill University in Montreal.

The DMT is an advisory group to SMB and maintains the IEC Directives for technical work, particularly in respect of the need to ensure harmonization of the IEC, ISO and JTC (ISO/IEC Joint Technical Committee) 1 processes. Directives are divided into two parts. The first lays down the procedure for technical work, i.e. how a TC (technical committee) or SC (subcommittee) is constituted, the responsibilities of the officers and how to go about developing an International Standard using the consensus principle. The second provides the rules for the



Carlo Masetti

structure and drafting of International Standards to ensure that, irrespective of the technical content, standards are drafted in as uniform a manner as is practicable. Working in the DMT requires considerable knowledge of the standardization process and members often have considerable previous experience, either as TC Officers or experts in a TC.



Richard Schomberg

PC 118: Smart Grid user interface

SMB approved the nomination of Richard Schomberg as Chairman of PC (Project Committee) 118, set up in 2011 to develop International Standards relating to the Smart Grid user interface.

Receiver of the 2011 IEC Lord Kelvin Award, Schomberg has been Vice President Smart Energy Standards

at EDF Group Corporate since 2011; previously he was Vice President – Research, North America, and from 2001 to 2009 was Vice President – Innovation Sourcing & Transfer.

As early as 2001, Schomberg “identified the disruptive opportunity of Smart Grids” and has been a key player in the

IEC Smart Grid activities, leading the SG 3 (Strategic Group) Smart Grid.

The concept of PC 118, whose task is to develop Smart Grid user interface standards, represents a new approach in the IEC – although in the past there has

been a JPC (Joint Product Committee) set up between ISO (International Organization for Standardization) and the IEC. SMB chooses to form a PC when there is a need to be able to deal with a specific task that is limited in scope but that does not fit into the work of any

existing IEC TC. Compared to a TC, a PC has a simplified structure with no subdivision into WGs (Working Groups). PC 118's task is to concentrate on the exchange between the demand-side of smart equipment and the grid and the relevant power demand response.

IEC TC 37: Surge arresters



It is important to ensure that supply of electricity remains uninterrupted

SMB approved the nomination of Volker Hinrichsen as Chairman of IEC TC 37: Surge arresters, for the period 2012-01-01 to 2018-12-31.

In overvoltage situations such as lightning or switching surges, it is important to ensure that the supply of ultra-high, high, medium and low voltage electricity remains uninterrupted. TC 37 is responsible for the surge arresters and other SPD (surge protective devices) that protect electrical supply systems and installations.

Hinrichsen is an electrical engineer with degrees from Berlin Technical University. In 1989 he joined Siemens' Power Transmission and Distribution facilities in Berlin as a Technical Assistant and rose to the position of Director R&D of the Siemens Surge Arrester Division in 1992. In 2001 he joined the Technische Universität Darmstadt as full professor in high-voltage engineering. At present, he is head of the high-voltage laboratories (accredited for dielectric testing up to 800 kV system voltages) and is active in education, research and testing.

IEC TC 66: Safety of measuring, control and laboratory equipment



The people using testing equipment need to be protected

SMB approved the second extension of the term of office of Ton Clercx as Chairman of TC 66: Safety of measuring, control and laboratory equipment, for the period 2012-02-01 to 2015-01-31.

In addition to being a representative of a TC whose work is essentially based on safety matters, Clercx is also a member of ACOS (SMB Advisory Committee on Safety), in which he represents TC 66. In his daily work, Clercx is faced with the safety, performance, dependability and repeatability needs of a great range of connectors and cables: industrial connectors, connectors for automated systems, components for the medical industry and renewable energy sectors,

together with a broad variety of test and measurement accessories.

The market for equipment within the scope of TC 66 is growing. It is used in a wide range of industry and educational establishments and by users with very different levels of technical knowledge. Manufacturers therefore rely on the International Standards of TC 66 to ensure that their products are safe and demonstrably meet national safety regulations, while for users, the standards provide assurance.

Going ahead in Melbourne

Group elects its 2011 Young Professional Leaders

The aim of the Young Professionals Programme is to get young managers and engineers involved in IEC work and Conformity Assessment activities, engaging them and involving them more in shaping the future of international electrotechnical standardization. Out of the 59 candidates selected by their IEC National Committee to participate in the October 2011 IEC General Meeting in Melbourne, Australia, three were elected by their peers as the group's Leaders.

Getting ahead

Since the first IEC Young Professionals' workshop in Seattle, Washington, US (United States) the group has not only looked, but indeed got ahead! The wind of youth that blew on Seattle produced the three leaders who helped set up and provide direction for the first year of the Programme. Now, the 2011 workshop, which was held during the 2011 IEC General Meeting in Melbourne, Australia, has elected the three Leaders who will be their voice for the coming year. *e-tech* interviewed each of the three for this month's edition.

Connecting the Smart Grid - David Victor Tackie of Denmark

David Tackie is an electrician and electrical engineer. He works as a



David Victor Tackie.



research and development engineer for Danish Energy Association, a commercial and professional organization for Danish energy companies. Alongside his job, he is studying for a Bachelor in Business Administration, specialising in Marketing Management, and he is also a board member at DBS Lys, a supplier of light bulbs, lamps and other electrical materials.

From new technologies to the Smart Grid and renewable energy sources

"I have always been highly interested in new technologies," explains

Tackie. "Currently I'm working on the development of the future electric grid. That includes EVs (electrical vehicles) and heat pumps." He continues, turning to the issue created by fluctuating renewable energy sources: "We're tackling the problem."

On one hand we can't use up the renewable energy obtained from wind turbines and photovoltaic production when it is produced and on the other we don't want to have to reinforce the grid unnecessarily during peak hours. It means we really have to monitor the grid carefully and understand the communication between the actors of the future electric grid", he says. "Here, International Standards are of great importance to us to prevent us from developing systems that will only be able to be used nationally."

A member of Danish Standards mirror groups

David has already been involved in international standardization work as a member of mirror TCs (Technical



IEC Young Professionals in session.

Committees) of the IEC National Committee of Denmark, Danish Standards, TC 8, TC 57 and as an expert for TC 8X WG 5 on Smart Grid projects in Europe. He finds the development of standards both “exciting and very beneficial for companies that have a long-term and sustainable business perspective”.

Being involved in international standardization work

“I see a lot of benefits in being involved in international standardization work,” says Tackie. “Keeping up-to-date with what is happening in my area of work, the Smart Grid, building up an international network of people that have the same interest as me... But that’s not the major reason I’m involved in standardization work.”

Developing standards that will benefit Denmark

There’s a national reason for being involved in international standardization.



Leaders: David Tackie (left), Jonathan Colby (2nd from right) and Elaine Clayton (right).

“My real motivation is to influence the development of standards, so that this will benefit Danish energy companies,” explains Tackie. “I’m interested in making it as easy as possible for the Danish energy companies to grow their business. I believe that business is not just about beating your competitors. We need to compete and cooperate at the same time. This is especially important when we are talking about the development of Smart Grid.”

“We need to understand that many of the actors in a Smart Grid are not just competitors, but complementors that are able to add value to our business. When you’re involved in standardization you need to see your competitors in a new light. On the one hand you’re competing for a market,” adds Tackie, “and on the other you need to cooperate to develop an International Standard that can increase that market.”

Communicating the value of standards

Elaine Clayton of Australia

Elaine Clayton is the Business Development & Marketing Manager for BWES (Black & White Engineering Solutions Pty Ltd), a regulatory compliance consultancy firm based in Sydney, Australia, that provides ‘cradle to grave’ testing and certification solutions and product development assistance/guidance to manufacturers of consumer products. Clayton has a degree in communications and is an associate member of the Australian Marketing Institute.



Elaine Clayton is one of three 2011 Young Professional Programme Leaders

Never knew standardization could be a career

“Professionally, I’ve been with BWES for seven years,” explains Clayton. “After graduating I became a graphic designer specializing in packaging and then set up

my own design and marketing company. At school, however, I was also good at maths and liked the technical subjects. My father’s a pharmacist who’s been involved in medical and pharmaceutical quality control and standardization with Standards

Australia. But even though I was familiar with the concept, I had never realized that there could be such a thing as a career in standardization.”

One of her first clients was BWES. That’s how she came to be aware of the regulatory world and product compliance. Today she works full time for BWES and is responsible for communicating to clients both the value of standards and their use in conformity assessment. Her marketing experience adds value. “I understand the concepts and can explain them in simple terms,” says Clayton. “In a highly technical world, it’s often difficult for an engineer to explain to others the importance of what’s being done. I can explain the importance of the IEC and how International Standards interface with everyday lives.”

Particularly conscious of safety aspects

Her key areas of responsibility at BWES include project management, product recalls reworks, risk analysis and conformity assessment of child-care products. With a toddler who's not yet two, she's particularly conscious of the safety aspects of standards pertaining to children in the house, and this, along with her use of standards on a daily basis has inspired her to become an active member of the Australian Industry Group's Electrical Appliances and Accessories Forum. In 2010 she was nominated by this forum as their representative on CS-106-Consumers Product Management Systems – the Australian committee for consumer product safety and the mirror committee for ISO (International Organization for Standardization) / IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*. "Safety is an integral part of all standardization work," says Clayton. "So the work we've been doing on Guide 51 is useful for practically every TC, not just within the IEC, but also ISO. We have to ensure that the information we're adding is relevant to how other IEC standards are developed. In the work I've been doing, I've learnt why one develops a particular

clause and how that's addressed." In addition to her work with CS-106, Clayton has also participated actively in three working groups relating to the IEC series 60335, *Household and similar electrical appliances – Safety*, most recently acting as the secretary and risk assessment facilitator at an ad-hoc working group concerning touch temperatures for IEC TC 61, Safety of household and similar electrical appliances.

The importance of standards

Clayton is passionate about people understanding the importance of standards, particularly where danger is concerned. Through her product compliance work, she's had to read a lot of publications. She's also carried out quite a bit of training, explaining how standards make a difference to a company bringing a product to market or wanting to import a product into Australia. "After there'd been a number of house fires in Australia due to plastic body electric heaters, the proposal for regulation was approved so that the products that didn't comply couldn't be sold anymore."

One of the publications she worked on as part of TC 61 was the part of

IEC 60335-1, *Household and similar electrical appliances - Safety - Part 1: General requirements*, that deals with touch temperatures of appliances both below and above bench height. Through this work she witnessed evidence from Melbourne Hospital on the severe nature of burns that children had received as a result of touching hot ovens and it's made her sensitive to the protection that standards provide to vulnerable users. "As a parent, you want to protect your child, so you need to know appliances are inherently safe and that they function in the way you expect", she says. But she's also realized that there are cultural and lifestyle differences that intimate that an International Standard won't cater for everyone in the same way. "In Australia we tend to have more open space kitchens and play pens for children are perhaps not as common as elsewhere, so the danger of a hot oven is very immediate to us." It's one of the reasons, she says, it's so important to ensure there is a broad representation of all countries on a committee, so that the standards are relevant to all nations. "That's what makes a successful standard."

Writing a standard takes communication and engineering skills

She's conscious that it takes an engineer to write the various technical clauses in standards but sees her contributions as analytical and then promotional. "In product management, many people have a marketing background and they need to understand the benefits of meeting a standard. If I can help them see that, once they do, they'll pass that knowledge on to the ultimate user of a product."

Clayton points out how IEC 60335 is essentially an International Standard dealing with the safety of electrical products, and as such contains a high level of technical content, but this in turn is driven in part by facets of consumer behaviour. "Obviously one needs an engineer to determine each clause, but then the reason that many clauses are developed in a standard is because you have to define the intention of a product and how it's used. So, in that respect, all standards have a need for people like me."

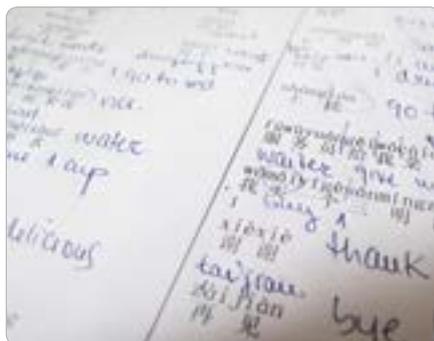


Clayton is conscious of the need to protect children who can be badly burnt when they touch hot ovens

Ensuring each word can be understood clearly

There's also a question of language. Clayton learnt Japanese and Italian at school and although she's not fluent, it taught her enough to understand the implication of saying something in one language that may have an entirely different connotation in another. "Once we spent a long time debating a word in a standard only to discover that the original publication had been written in a different language and the word had been incorrectly translated."

She's now trying to learn Mandarin at work. "It's something I've learnt from the YP programme, that learning another language is really useful. I already need to concentrate intently in our meetings, so I can appreciate how difficult it is for those others who don't have English as their mother tongue. In standardization it's important the language is understood by others. Sometimes words can have an entirely different meaning in another language and you can go off on a tangent as English has connotations and denotations." Whilst the latter is more pertinent to engineering, she says, "when you have an association with a word, you still have an emotional reaction to it, and this can be different depending on your



Clayton knows the importance of learning languages: she is studying Mandarin

cultural background." She explains, for example, that Thai has a multitude of words to describe family relationships. There are three alone for both Auntie and Uncle that vary depending on which side of the family is being referred to, the mother's or the father's, and the age of the relative, which may add social significance.

Once an International Standard has been published, communication is also an essential tool in educating companies on the importance of compliance. One way to reach a non-technical audience, says Clayton, is by talking about product safety. "Often people ask why they have to comply with a standard. Why bother? When you explain in non-technical terms that a consumer could get injured, they look at it

differently. They understand how easy it is for a child to have an accident in their own home and then the importance of what the IEC is trying to accomplish becomes clearer. "Whilst companies often address the foreseeable safety of their products for the intended user, it is equally important to safeguard those who are vulnerable – children, the elderly and the disabled."

Standardization as a career

Clayton would like to spread the value of the IEC YP further afield. "Since I became involved in the YP Programme, I've had discussions with the Australian NC (National Committee) and we're looking at developing our own programme for YPs in Australia. The more we involve the younger generation, the greater the long-term benefit. It's alarming for me to know we're employing people who have few notions of what standardization involves. I find I'm training engineers who've graduated without any knowledge of the use of standards. Launching this programme on a local level means there should be more emphasis put on the path that standardization offers in terms of a profession. I had no idea such a career path existed at high school and I fell into standardization by chance. Had I known I'd have chosen it by choice."



Jonathan Colby

Building up the tidal strait!

Jonathan Colby of the United States

Jonathan is a Hydrodynamic Engineer with Verdant Power, a marine renewable energy company that has its main project in New York City's East River. He has been with the company since 2006 after he completed a Master's Degree in Aerospace Engineering at the Georgia Institute of Technology. As a member of the company's Engineering and Resource Assessment Teams, his

work includes turbine blade design, hydrodynamic modelling, data processing and analysis, fieldwork, and general turbine operation responsibilities for both US and Canadian projects.

Expert on marine renewable energy

Jonathan Colby is a US representative on IEC TC (Technical Committee) 114: Marine Renewable Energy, and a



Using fast flowing tidal energy (Source: Verdant Power)

subject matter expert when it comes to developing standards for the assessment of power performance for tidal energy converters. Colby is also actively involved in outreach with organizations and universities in the New York City area.

Colby describes how the company for which he works has its main project in New York City's East River. "Contrary to what its name indicates," he says, "New York's East River is a tidal strait. We've developed a technology that captures energy from the moving water using turbines placed on the river's floor." His company has just been given the go ahead by the US FERC (Federal Energy Regulatory Commission) to install the first tidal energy pilot system for the RITE (Roosevelt Island Tidal Energy) project which is expected to generate electricity for 9 500 homes.

Involved in IEC TC 114 from the outset

Colby explains how he has been involved in this clean-energy technology, part of a new and emerging industry, almost since the outset. It has meant he has had to clear the various hurdles involved in moving from concept stage to prototyping, demonstration and then to

commercialization of a product. "Verdant Power," he says, "was approached early on by the US NC (National Committee) and asked to participate as a company in the newly formed TC 114 being set up to address renewable marine energy. We were particularly keen to participate from an early stage as we knew that the development of standards would be critical to the development of our industry."

As a result, he has been actively involved in standardization activities over the last four years, both as an expert in IEC TC 114/PT (Project Team) 62600-200 which is working on producing the first publication of a TS (Technical Specification), *Power performance assessment of electricity producing tidal energy converters*, and as the Chair of the US Shadow (NB mirror) PT 62600-200. "There aren't that many developers of this type of technology in the world. So the IEC, through the US NC, were looking to our industry for guidance in setting down the basics because of the knowledge we have gained in deploying the technology." His participation has continued and at the end of January 2012, Colby was in Dublin for a meeting with

his fellow PT team members. "Our group is well represented by developers and people from utilities, together with a few representatives from the academic world." In future, Colby will be taking on additional responsibility as Convenor of an MT (Maintenance Team).

Sharing experiences with other young professionals

Participation in the Young Professionals' Programme has not had a great impact on the physical development of the actual standards in which Colby is involved. But it has been invaluable in helping elevate the perception of his industry and bring the efforts of IEC TC 114 to the attention of a much broader group within the IEC. "Given how new our industry is, and how we're trying to reach a higher level of commercialization and viability, it's absolutely critical for this industry to have as much exposure as possible," he says.

"At the IEC General Meeting we repeatedly talked of the concepts of energy efficiency, renewable energy, the systems approach, connections, EMC (electromagnetic compatibility), EVs (electric vehicles) and Smart Grids. They were recurring themes. As a representative of an emerging industry, I'm able to share information with my fellow-YPs but moreover, because of the contact possibilities we were given through the programme, I've been able to discuss with the management level of IEC. That has been really valuable."

Contact with SMB and CAB particularly valuable

He explains how the YP Programme workshop in Melbourne, Australia, gave him the opportunity to attend the SMB (Standardization Management Board) and CAB (Conformity Assessment Board) meetings. "It was an excellent way for me to learn how the IEC operates at upper levels. It also gave me a better grasp of how the IEC coordinates standards' development activities and functions in various global economic markets."

The workshop included an opportunity to lunch with SMB and CAB Members and converse with the convenor of a working group on Conformity Assessment in the marine renewable energy industry. "In our particular industry, while the technology is important, there's also the maintenance side that's critical."

Aggressive fast-moving salt environment requires standards

Colby outlines how operating in a salt environment with fast flowing tidal movements is very challenging. It affects how repairs and maintenance are carried out and includes the barge operators, the boats, divers and so on. "We have to keep our objects operating. We're picking the fastest flowing bodies of water there are and going to the most energetic sites that exist. So having standards is very important, not only for the systems but also for their future maintenance too."

There's an important financial aspect involved in working in an emerging technology, he explains. It has to do with being able to reassure investors, users and authorities. Much of that can be obtained through standardization. "Because we're still in relative infancy we're perceived as being a high risk industry. We haven't fully addressed the reliability and longevity issues yet. So any progress we make is likely to encourage investors, insurers and regulators and so on and make them more likely to support our efforts than they would have done otherwise."

The role of standards in an emerging industry

"If I tell an investor that my turbine is producing 35 KW of power how does anyone know that's true? How can I substantiate that? With my TC WG (Working Group) we've developed a TS (Technical Specification) that, when followed, will lead to a result that can be trusted from a performance perspective. In turn, that provides the confidence that a turbine will function as we've claimed



Turbine for tidal energy

it will. It's all a matter of reducing the perceived risk."

Other networking opportunities

He feels the networking possibilities the YP programme gave him to work with his peers have also been beneficial. "My ability to contribute my experiences was very valuable. I was perhaps one of the more experienced individuals at the workshop so I was able to talk about my experience to the others and say how that functioned within the IEC. It's valuable for a team to have various levels of expertise at the YP workshop."

On a personal level he also gained. "The ability to interact with individuals from across the globe, each with widely varying backgrounds in science, engineering and IEC experience, was invaluable, as are the friendships I began with my fellow attendees. I was able to gain valuable insight into the way different countries and organizations utilize standards and contribute to the IEC. So, if it was good for me personally, it was also a valuable experience for Verdant Power, my company. Once the TC 114 publications are released, they are going to be highly useful."

Future role as a YP leader

At the completion of the three-day workshop in Melbourne, Colby was one of three leaders to be elected from the 2011 group. "I was honoured to be elected by my peers. Now I'm looking forward to giving some of my energy back to the group." He sees himself working to engage the 2011 members fully in the YP programme and going beyond the YP network to the IEC at large. "We plan to host web-based seminars highlighting a variety of relevant topics within the IEC, including the role of standardization in emerging industries, among others. I am excited to work closely with my fellow YPs to ensure we all remain active members in the standards development process, both nationally and internationally."

Encouraging NCs to participate in the programme

Colby points out the value there is to an NC in sending a Young Professional. "Beyond the value of their contribution, there is a good reason for any NC to send engineers or professionals from their country to participate in the programme. It puts their representatives in a place of visibility and provides valuable experience to young professionals, so in those terms it's very beneficial for any national committee."

Measuring stick

Challenges in Asia Pacific

Interview with Robert Chua, former President of Singapore NC (National Committee) and CB (Council Board) member of the IEC as well as Chairman of the IEC Asia-Pacific Steering Group on challenges for the IEC in the Asia/Pacific region.



Robert Chua, former President of Singapore NC and Chairman of the IEC Asia-Pacific Steering Group

Increase awareness

When asked what the biggest challenge is for the region in which he is active, Chua mentions the need to educate manufacturers about the IEC which is not well enough known by them: "Manufacturers look at Europe and the US and often think because Europe is very strict about certification that the CE certification is enough...that if they comply with CE then their product is good to go anywhere...they don't understand that IEC Standards are the "measuring stick",

that their product needs to comply with IEC International Standards". Chua further underlines that people in governments and in national committees change often and that there is a constant need to educate new people so that they can pass their knowledge on to those audiences that need to know.

From followers to leaders

Chua believes that while all important countries in the region actively participate in standard setting, others have not yet caught on. Those he encounters he tells: "if you are just receiving standards set by others, they have the advantage. If you think it's not a worthwhile investment to participate, than you will just remain a follower." China is starting to understand this and they are working on improving their language skills to better participate. As a short-cut, some Chinese companies try to hire consultants who are real technical experts. However, active participation in international standardization is not only a technical decision. Furthermore, countries like China sometimes also find it challenging to influence the work of the IEC.

Realize that International is essential

Nevertheless, language clearly is a barrier for China, Korea and Japan. However, Chua believes an even bigger barrier is that countries in this region need to realize that International is essential, that they need

IEC International Standards not just national or regional standards. They must be prepared to invest.

Simplification needed

Chua also believes that standards must be made simpler to read and understand: "you shouldn't need a lawyer or have a PhD to apply a standard." Chua is convinced that simplification doesn't mean that the standard will lose its essence. He feels: "It all comes down to making a complex subject simple enough to understand", and in his experience this can and increasingly must be achieved. The language barrier is one reason for the need for simplification; the other is that users often don't have the same education as the experts who wrote the standard.

Involving the next generation

Finally Chua underlined how glad he is that the IEC is reaching increasingly out to Young Professionals: "if you don't give importance to education and succession planning, than there is going to be little awareness of standardization and little interest in getting involved." Greentech is in his opinion a good platform to get more young people interested: "they realize that standards are needed so as to not repeat mistakes and because they provide a platform on which things can be built. Everything else is a waste and people increasingly realize this."



From l. to r.: Robert Chua with Gabriela Ehrlich, IEC Head of Communications and Dennis Chew, Regional Director IEC-APRC



It's important for the younger generation to get involved in standardization work

Energy efficiency

Keeping in pace with industry needs

Interview with Mr Renny Yeo, the new Singapore NC (National Committee) President, on ideas and plans for making IEC Standards more relevant to the Singapore industry.

Yeo needs little introduction to the manufacturing community of Singapore as for more than 20 years he has been involved in SMa, the Singapore Manufacturers' Federation. He was a Chairman and subsequently Senior Advisor of the Electrical & Electronics Allied Industries Group, before becoming the President of SMa from 2009 – 2011. Yeo is an entrepreneur and CEO of various companies including Singapore Cables Manufacturer Pte Ltd and Datacom Pte Ltd. This wealth of experience and expertise is extremely useful in his position as the President of the Singapore NC of the IEC with effect from April 2011.

Systems standards needed

Right from the start of the interview Yeo underlined the need to include aspects of energy efficiency in IEC products standards and systems standards. "We need these standards to build a green environment. If

such standards are not available, everybody will develop their own standards, which will result in a proliferation of industry and national standards", added Yeo.

He highlighted that the Singapore Green Building Council, of which he is a Board Member, has spelt out the need for standards that incorporate energy efficiency, production processes and waste management requirements to be used on green buildings. For example, having a system standard for all electrotechnical devices in this environment would be useful.

Existing standards difficult to identify

Not only that, Yeo said: "IEC Standards often comprise elements that are useful to achieve increased energy efficiency but they are too difficult to find. There is a real need for them to be better indexed or better still to have a separate section in the standard so that it is easier to find. It is important to make the standards as user-friendly as possible so that people can derive the maximum benefits from them".

Educating future business leaders

Yeo has some ideas for what he wants to accomplish for the IEC in Singapore.

He strongly feels that there is a need to establish academic programmes to educate future business leaders, possibly jointly with other countries. He would also like to increase the information exchange in the region. Last but not least he feels that more companies need to be made aware about the impact of standards on business and the bottom line...how much it costs a company, when it doesn't actively participate in standardization and therefore is adversely affected by new standards or the changes in existing standards.



Renny Yeo, President of the Singapore NC

Renny Yeo

Renny Yeo has nearly 40 years of working experience in the field of shipbuilding/ship repairing, electrical engineering and cable industries.

Yeo holds a Higher National Diploma (HND) in Electrical & Electronic Engineering from Southampton College of Technology, UK and a Masters in Management from the Asian Institute of Management, Philippines.

Yeo is a full member of the Singapore Institute of Directors and was a former Board member of the Building

and Construction Authority and of the Productivity & Standards Board (predecessor of SPRING Singapore).

Currently, Yeo serves as the President of the Singapore National Committee of the IEC. He is the Chairman of the Singapore Accreditation Council, a Member of the Singapore Standards Council and a Board member of the Singapore Green Building Council. Yeo is also currently the Honorary President of the Singapore Manufacturers' Federation.



There is an increasing need for standards that incorporate energy efficiency (Photo: The Lucida)

Integrating home networked devices

Paving the way for the smart grid

Integrating a myriad of networked devices in homes will make daily life more enjoyable and convenient and open up opportunities for managing energy supply and demand sensibly. Work by the IEC, in collaboration with its sister organizations ISO (International Organization for Standardization) and ITU (International Telecommunication Union), in preparing International Standards for networking the home environment will ensure that tomorrow's homes will be smarter.

Planning home networking

Home appliance manufacturers and utilities are actively planning the networking of home appliances and electronic devices of all kinds. This trend is driven by public and private concerns regarding energy efficiency and environmental issues. Plans to introduce a Smart Grid to manage energy consumption more effectively are also behind the development.

Collaborative enterprise

As the networking of all these devices involves the preparation and adoption of standards in the electrotechnology, ICT (information and communication technology) and telecommunication domains, collaboration between the IEC and ISO within ISO/IEC JTC 1 (Joint Technical Committee) 1, Information technology, and with ITU-T, Telecommunication Standardization Sector, is essential, in particular as regards communication protocols and interfaces.

Cable and wireless

Home networks use various media: IT cables, wireless connection or PLT (power line transmission).



Remotely turning lights on and off in the networked home

Groundwork for the cabled home is already well under way with standards prepared by ISO/IEC JTC 1/SC 25 (Subcommittee) 25, Interconnection of information technology equipment. Networks using structured cabling as specified in ISO/IEC 15018, *Information technology – Generic cabling for homes*, are now a regular feature of many new homes or in renovated properties.

Networks in home environments are also being more widely accepted, thanks to the use of wireless technology and PLT. Work on the WiBEEM (Wireless Beacon-enabled Energy Efficient Mesh network) Standard for wireless home network services continues.

Homes are also increasingly equipped with HES (Home Electronic Systems) that meet the ISO/IEC 14543 series of HES architecture standards, which allow the interoperability of products from different sources. An energy management system for HES is addressed by the ISO/IEC 15067-3 *Information technology – Home Electronic System (HES) application model – Part 3: Model of an energy management system for HES* International Standard.

ISO/IEC JTC 1/SC 25 also recently released International Standards in the 29341 series for UPnP (Universal Plug



Home appliances will be controlled remotely in the future, saving energy (Photo: Miele)

and Play) Device Architecture, which allows devices to communicate with each other across networks (see Plug and Play article in this edition of *e-tech*).

Networking homes for energy efficiency

Given the current overall attention paid to energy consumption and environmental issues, the modern networked home does not focus only on connectivity *per se*, but seeks to give occupants greater control over home appliances and electronic devices and over energy use.

This can be achieved by allowing management of lighting, temperature and appliances to be incorporated with specific home multi-media and communication system controls that take into account the Smart Grid and the availability of cheaper-rate power at times of lower demand.

As power from renewable energies will be fed into grids, networked homes will have a role to play when EVs (electric vehicles) enter the overall equation. In a Smart Grid configuration, EVs can be used to balance out consumption peaks and troughs, as they can be charged and act as storage units during peak supply time and then provide a source when demand is at its highest.

The drive to network homes is gathering momentum in several regions of the world.

In Europe, CENELEC, the European Committee for Electrotechnical Standardization, started work on its SHR (SmartHouse Roadmap) Project in 2009. In Japan the Echonet (Energy Conservation and Homecare NETWORK) consortium developed a standard of the same name for communication between appliances and networks. Echonet was accepted as an International Standard by IEC TC 100. China and Korea are working on solutions similar to Echonet. (For details of these regional initiatives, see Standards for intelligent homes -



LG HomNet panel to control home appliances (Photo: LG)



In-Home-Display showing the electricity consumption status in real time and allowing wireless control of each home appliance. (Photo: HAI - Home Automation, Inc.)

European and Asian perspectives, in *e-tech* June 2011.)

Thanks to the work of ISO/IEC JTC 1/SC 25, in the future,

home occupants in many countries will be able to manage their energy use better and to programme their home appliances and devices.

Ever thinner

Components and materials reduce in size and increase in power

At the CES (Consumer Electronics Show) in Las Vegas it seemed that the real buzz word for 2012 was THIN. While the trend is towards ever smaller components, screens – which are thinning down too – are becoming larger. There's less distinction as to what really constitutes a computer. Telephones can act as tablets that can act as remote controllers that sometimes fit into screens that might be TVs with computing powers.... Even the traditional household device now comes equipped with a chip that provides it with intelligence and the ability to connect and communicate – provided it has a screen. IEC TC 110: Electronic display devices, deals with the essential ratings and characteristics of electronic display devices, providing methods for testing and measuring the many different categories and technologies.

Bigger and more powerful

While one leading computer manufacturer was launching the company's first 27-inch all-in-one PC – with a monitor that tilts up to 25 degrees, and offers multiple possibilities for connecting to and charging various laptops using USB (universal serial bus) connections – the talking points at CES were the new Korean 55-inch 3D OLED (organic light-emitting diode) displays, just 4 mm thick, and 4K TV, the latest standard for UHDTV (ultra high definition television) that measures 4 320 pixels displayed horizontally (or, in numbers of pixels per frame, $7\,680 \times 4\,320 = 33$, megapixels). In comparison, a typical 1 080p HD resolution has roughly two million pixels per frame, ($1\,920 \times 1\,080 = 2\,073\,600$), roughly 16 times fewer. IEC TC 110 has already issued six publications dealing with OLED displays and clarifying environmental testing methods and quality and performance measurements and parameters.

Another Korean company was showing a 55-inch smart OLED TV with facial recognition that causes the programme to change, depending on who is sitting watching it. Numerous applications make it almost as much a PC as it is a TV. At the same time, a leading Chinese company was unveiling what it claimed was the world's thinnest smartphone, a mere 0,23 inches thick, and an American its innovative glass that enables the thickness of screens and displays to be reduced by 20% percent.

Organic light-emitting diodes

Because it has no need for a backlight, an OLED screen can be thinner than an LCD (liquid crystal display) and display higher contrast ratios. It also has the advantage of being flexible – something that is not possible with LCD. But, where OLED formed the centre of attraction for the TV, it was the AMOLED (active matrix organic light emitting diode) that gained a lot of attention in the smartphone market. Labelled as a “new type of smartphone”, the devices might just as easily be classed as tablets.

One Korean model comes with an electronic “S Pen” for writing notes or sketching directly into the phone's system.

Another, with an HD touch-sensitive screen, has been designed with gaming in mind. It includes the NFC (Near Field Communication) technology for fast contactless exchange of information. NFC is based on ISO/IEC 14443, the standard developed by WG (Working Group) 8 of SC (Subcommittee) 17: Cards and personal identification, in ISO/IEC JTC (Joint Technical Committee) 1: Information technology. This joint technical committee of the International Organization for Standardization and the IEC is responsible for developing, maintaining, promoting and facilitating



The 27-inch all-in-one PC (Photo: ASUS)

information technology standards such as MPEG and security standards for smart and identification cards.

Active matrix OLED

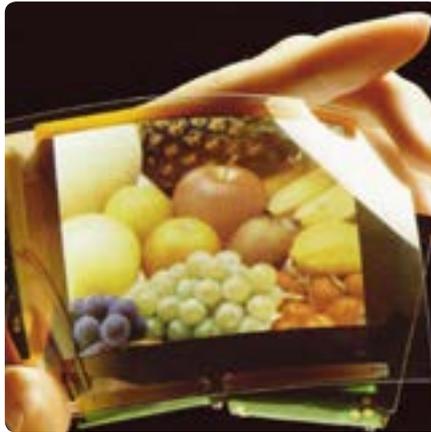
An AMOLED display uses an active matrix of OLED pixels that light up using an array of TFTs (thin film transistors). Each pixel on the screen has at least two TFTs, one that starts and stops the charging of a storage capacitor and one that provides the voltage source of current to the pixel. The touch capacity is provided by capacitive sensor arrays. An AMOLED display has the advantage over a passive-matrix OLED display because its response time is much faster. That makes it much more suitable for portable electronics where the power consumption is critical because of battery life. Since the touch screen is capacitive, it needs something that conducts a charge between the finger and the screen.

LCD to take on new lease of life

It looks as though LCD technology is moving to new domains and taking on a new lease of life where it is expected to become more prevalent as an advertising tool in shop windows. That's made possible by the price of flash memory falling which, in turn, makes small screen advertising accessible to a greater number of users. One of the objectives of IEC TC 110 WG 2: Liquid crystal display devices, is to re-define performance measuring methods for LCD, such as the ranges of viewing angles, colour shifting, motion artefact and reflective performance.

Ultra thin laptops

According to Network World, every CES has a "buzz" technology and after the previous years in which the stars were tablets and 3D televisions, they suggest that this year's buzz tech is the Ultrabook™, a super-thin laptop. Shawn Dubravac, CEA (Consumer Electronics Association) Chief Economist and Director of Research, expected there to be around 30 to 50 of the new super-thin systems presented. Finally, he said, a single manufacturer alone



Thin flexible AMOLED screen

presented more than 75 different models! "The focus is not so much on computing itself", he said, "or how powerful it is, but on interconnectivity".

The Ultrabook™ has the advantage over a tablet in that it retains a keyboard. It sports rapid, powerful chips. The display screen measures 13,3 inches or larger and the systems offer at least half a terabyte of internal flash memory storage. Compared to traditional hard disk space, flash memory is available immediately for use when the system is switched on. The extra thin dimension of the Ultrabook™ is largely due to Intel's Ivy Bridge chipset that also provides increased speed and faster response times.

Thinner peripherals, thinner glass

It's not only the computer that has slimmed down. The protective glass on the screens of tablets, smartphones and other devices has reduced in thickness. While being better adapted for touch applications, the finer material is just as protective and sturdy. For instance, one of the new portable office computers on show had a high resolution 14 inch Gorilla glass 1 600 x 900 screen with scratch-resistant glass panels on the lid, display, palm rest and trackpad.

If the glass makes the system feel a little heavy it does give it a special touch. And, in another move towards smaller sizes, the manufacturer has reduced



Ultrabook (Photo: ACER)

the bezel, enabling the 14-inch display to be fitted into a traditional 13-inch chassis. Future displays, according to specialists at CES, are likely to continue to be touch sensitive, but move from their present solid state to a flexible one.

In recognition of this market move from traditional flat panel display devices toward a more universal electronic display, IEC TC 110 broadened its scope in 2010 to take into account the new e-paper and flexible display applications that are now being developed, together with the necessary government regulations concerning recycling, waste material and energy efficiency.

Trend towards interactivity continues

Interaction is the operative word for all systems this year. Google TV, for example, allows you to view web content as well as search for episodes you might have missed in a TV show. At the other end of the scale, tablets or phones running Mac OS or Android use a wireless connection to control all the devices in the home entertainment system.

Many leading manufacturers are combining gesture recognition and work on touch screens and voice control. Often screens can be twisted, or are transparent, enabling them to function both as a tablet and then as a system controller, a sort of sophisticated mini

remote control for a larger system such as an interactive TV or PC. In some cases, smartphones can also combine with a touchscreen. One smartphone, the winner of a CES 2012 award, simply fits into the back of a tablet-like screen or can be connected to it by cable, providing it with all the intelligence

needed for browsing the web.

The New Scientist's Peter Nowak predicts that, just as touchscreen technology has invaded the mobile market, the remote controller will gradually stop being used with TVs, to be replaced by motion control technology. Personalized and centralized systems

will mimic natural actions using reality-based interfaces that run on a variety of operating systems. The systems will be controlled with the wave of a hand rather than a multiple-button remote control. This type of interactive approach makes the job of ISO/IEC JTC 1 ever more important.

Dealing with display technologies

IEC TC 110 is responsible for producing International Standards on a broad variety of electronic display devices. These range from LCD (liquid crystal display) and solid state devices, plasma display panels, OLED (organic light emitting diode), 3DDD (3-dimensional display devices) and NVD (nonvolatile display devices) to FDD (flexible display devices).

The committee's work includes environmental test methods, quality assurance, endurance and mechanical ratings and tests, measuring methods for panel strength, e-paper display, acoustic noise, 3D stereoscopic displays, endurance and lifetime and other such specifications.

Liaising and working with other IEC TCs on electronics, components and EMC

In terms of the electronics of audio, video and multimedia systems and equipment, TC 110 works closely with IEC TC 100: Audio, video and multimedia systems and equipment. Where components are concerned, the committee liaises closely with:

- IEC TC 39: Electronic tubes, and
- IEC TC 47: Semiconductor devices.

There is also collaboration with IEC Technical Committees:

- IEC TC 76: Optical radiation safety and laser equipment;

- IEC TC 77: Electromagnetic compatibility, IEC SC 86C: Fibre optic systems and active devices;
- IEC TC 111: Environmental standardization for electrical and electronic products and systems, and
- CISPR (International Special Committee on Radio Interference) subcommittees
- CIS/H: Limits for the protection of radio services, and
- CIS/I: Electromagnetic compatibility of information technology equipment, multimedia equipment and receivers.

Wired for the future

Connections are not only about wireless

The buzzword in the multimedia world now is wireless: audio-visual devices communicate wirelessly, content is distributed and accessed via wireless networks, some mobile devices can be charged wirelessly and cables are often seen as unnecessary. However, as shown by the HDMI (High-Definition Multimedia

Interface), whatever the benefit of wireless connection, there is still no alternative to cables for many applications.

All-purpose connection

As AV (audio-visual) and multimedia systems moved from analogue to digital,

the demands placed on equipment called for a new interface to transfer digital data between devices and replace the myriad of leads developed over decades to connect various devices.

The digital interface of choice that has emerged as the *de facto* standard in the

last 10 years is HDMI was developed following an initiative launched in early 2002 by the “HDMI Founders”, a group of seven leading AV and connecting device manufacturers.

Ten years later, HDMI interfaces are found on virtually all new AV and multimedia devices such as TVs, home entertainment systems, PCs (personal computers), digital video cameras, tablet computers, game consoles and portable handheld devices. They are now also entering the automotive sector.

All in one, one for all

HDMI is typically used to connect a digital source, such as an HD DVD or a STB (set-top box) to an HDTV. A single HDMI cable combines video and multichannel audio. Using analogue leads, provision of the same connection would require three component video cables, plus six audio cables...

Because HDMI is a digital interface, it can deliver the clearest image of any cable type and handle HD video in the current 1080p (1 920 pixels wide by 1 080 high, progressive scan) format. It is the only connection that can carry 3D video signals.

HDMI can also support eight audio channels of the highest quality. Eight separate analogue cables would be needed to deliver audio of similar quality.

HDMI is compliant with a number of IEC International Standards, such as IEC 61937, *Digital audio - Interface for non-linear PCM encoded audio bitstreams* applying IEC 60958, for compressed audio streams, and also uses colour spaces defined in IEC 61966-2-4 *Multimedia systems and equipment - Colour measurement and management - Part 2-4: Colour management - Extended-gamut YCC colour space for video applications - xvYCC*, among others.

IEC TA (Technical Area) 1, Terminals for audio, video and data services

and contents, part of TC (Technical Committee) 100: Audio, video and multimedia systems and equipment, includes HDMI in its specifications for DTT (Digital Terrestrial TV) and satellite

channel that enables a TV to send audio data “upstream” to an AV receiver or surround sound controller, increasing user flexibility and eliminating the need for any separate audio connection. In addition,



HDMI connector

and terrestrial receivers for ISDB (Integrated Services Digital Broadcasting).

Flexible and evolving interface

AV and multimedia equipment are constantly changing with new technologies and formats being continuously introduced. HDMI has been designed to ensure that new devices can be interconnected and improved standards supported.

This approach is similar to that adopted for the USB (Universal Serial Bus) standard used in computers and telecommunication devices. The current USB 3.0 is backward compatible and offers transfer rates up to 400 times faster than the original USB 1.0 (see article on USB in *e-tech*, November 2011).

HDMI 1.4b is now available. In addition to delivering a bandwidth and transfer rate twice those of the original HDMI 1.0 specifications, this version supports 4K TV (up to 16 times the current HDTV definition). It also offers an audio return

HDMI 1.4b provides an Ethernet channel that allows Internet-capable HDMI devices to be interconnected.

Up to 10 HDMI-enabled and connected devices, such as Blu-ray disc players or home entertainment systems, can be managed from a single remote control thanks to CEC (Consumer Electronics Control), a technology included in HDMI and common to many new multimedia devices. For instance, no special programming is needed to switch on the TV, DVD player and receiver with the TV remote at the same time, and to adjust the system volume using just one button.

Huge installed base

HDMI has emerged as the preferred digital connectivity standard since it was introduced 10 years ago.

According to market research company In-Stat, 5 million HDMI devices were sold in 2004, 63 million in 2006 and 228 million in 2008. In-Stat forecasts that 1 150 licensed HDMI adopters will



This Yamaha home theatre system has five HDMI ports (left) and many analogue connections...



Some HD camcorders, like this Canon Legria offer HDMI connectivity (Photo: Canon)

ship over 800 million HDMI-compliant products in 2012, an increase of 17% over 2011. This will translate into a worldwide installed base of over 3 100 million HDMI products.

This huge market is the result of HDMI becoming the *de facto* digital AV interface standard and also because it offers a wide range of cables and connectors to meet different needs. The current HDMI 1.4 specifications propose five cable types to

choose from, each designed to meet a particular performance standard.

HDMI 1.4 also defined two new connectors, a "Type D" micro connector, approximately 50% smaller than its mini connector and roughly the size of a mini USB connector, and a "Type E" connector for automotive connection.

The micro connector is designed for mobile phones, pocket cameras and other

portable devices. It features a full 19-pin array, like other HDMI connectors, and can handle 1080p video signals, bringing full HDTV resolutions to handheld devices.

Lucrative market

HDMI connection is a must for any current AV device. However, its installation is not free: HDMI adopters pay an annual fee of USD10 000 (with special arrangements for low-volume producers); they also pay a royalty of between 4 and 15 US cents per unit sold, depending on use of the HDMI logo and of the HDCP (High-bandwidth Digital Content Protection) copy protection scheme that is backed by major content producers. Given the growing number of licensed HDMI adopters, the installed base and the sales forecast for HDMI-enabled devices, this interface is proving a very profitable development for its founders.

With its potential for further evolution to support technological innovations and the demands of the AV and multimedia industries, HDMI is looking at a bright future .

Expanding demands

Clean renewable world energy



Niagara Falls at the junction of Canada and USA created the world's first large AC hydro-power system in 1895

by IEC TC 4

Since IEC TC 4: Hydraulic Turbines, was set up in 1913, the world's population has multiplied by a factor of 4 – now over the 7 billion mark. Almost a third of the world's population still has no access to basic electricity and world estimates are that current levels of electricity consumption will double by 2030, mainly led by developing countries. Demand for clean renewable energy and proper management of water resources is higher than ever, owing to an increased awareness of

global pollution and the need to better integrate and optimize new energy sources.

Importance of clean renewable hydro generation

The UN (United Nations) has put renewable energy at the top of its agenda in 2012 and the UN General Assembly has declared 2012 the "International Year for Sustainable Energy for All". By early 2011 at least 118 countries had some type of policy target or renewable energy support policy at the national level,

up from 55 countries in early 2005. IEC TC 4 experts are technical contributors to various worldwide organizations including the IHA (International Hydropower Association) whose recent Congress meeting in Brazil identified a need for increased urgency in addressing key sustainability challenges relating to:

- Water security
- Energy security
- Climate change
- Poverty eradication
- Development

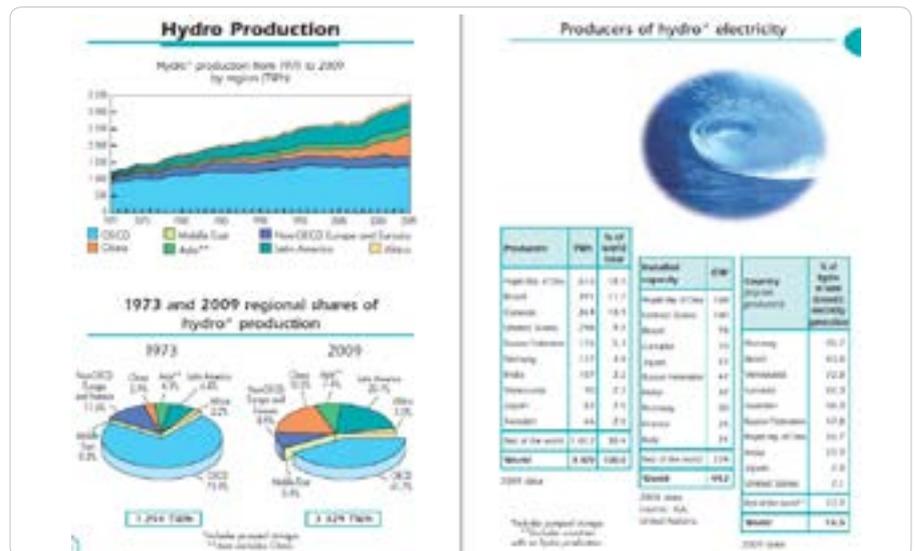
Sustainable power from water

Hydropower development is at the intersection of these challenges, offering the potential to both mitigate greenhouse gas emissions and to help advance the adoption of renewable energy sources. Equally important are the environmental and social aspects of water that can be included as part of a clean-energy multipurpose water management infrastructure. By essence a hydropower installation amasses water and thus makes access to water easier for a greater number of people. The IEC’s 2010 White Paper, *Coping with the Energy Challenge*, cites large-scale hydropower as playing a leading role in renewable energy generation, particularly in large transitional and developing countries, where it will make the biggest contribution towards clean-energy generation.

Considering that the other two major sources of renewable energy, wind and solar, are susceptible to availability fluctuation, hydro facilities with large storage reservoirs can also play an important role in balancing power generation and load, thus helping to maintain the security of electrical systems. The ability to provide these services, coupled with low cost and long life expectancy, make hydropower one of the most durable, flexible and valuable generation assets on the electric grid.

World contributors to hydroelectricity

Since 1990, global hydropower generation has increased by 50%, with highest



World Hydro Production (Source: IEA 2011 Key World Energy Statistics)

absolute growth in China which produced 721 TWh in 2010 – roughly 17% of domestic electricity use. According to new research published by the Worldwatch Institute the use of hydropower increased more than 5% between 2009 and 2010. In 2010, worldwide hydropower use reached 3 427 TWh, just over 16% of global electricity consumption. The technically exploitable potential for hydropower is estimated at more than 16 400 TWh/year with China, Brazil, the US, Canada and Russia accounting for approximately 52% of world installed hydropower capacity in 2010.

Pumped storage hydro the most technically viable

New energy storage technologies are being developed to compensate for the variations in availability and fluctuation of certain renewable energy resources. As a result, there is much on-going research and debates as to the relative benefits of various forms of storage.

Of all of the energy storage technologies available, pumped storage hydro is the most established and technically viable. Currently it is also cost competitive due to the low interest rates available for financing it and the wide array of ancillary benefits it provides to a region through the electrical grid. It is able to achieve one of the highest

lifespan efficiency cycles at some of the lowest costs. Interest in pumped storage is increasing, particularly in those regions and countries with the most variable renewable resources and where there is less potential for new installations of traditional hydropower. The vast majority of pumped storage installations are currently found in Europe, Japan and the US.

TC 4 – Hydraulic Turbines

IEC TC 4, as one of the earliest IEC TCs, is responsible for hydraulic turbines, with some 14 International Standards and guides published. There are eight different WGs (Working Groups) actively developing new International Standards and maintaining existing ones. TC 4 also works closely with other Technical Committees and with ISO, in particular ISO TC 108/SC (Subcommittee) 2/WG (Working Group) 6 on Vibration in hydraulic machine sets, and IEEE (Institute of Electrical and Electronics Engineers) Hydroelectric Power Subcommittee on Hydropower plant controls; IEC TC 57/WG 18 on Hydroelectric power plants – Communication for monitoring and control, and IEC TC 114: Marine energy – Wave, tidal and other water current converters. It is also in contact with CENELEC (Comité Européen de Normalisation Electrotechnique), the European Committee

for Electrotechnical Standardization; ASME (American Society of Mechanical Engineers), involved with field flow measurements in hydro installations, and other regional SDOs (Standardizing Development Organizations).



Yecheon Pumped Storage Power Plant (Korea). "Courtesy of Emerson Process Management"

Among the various TC 4 documents presently under review is IEC 62256, *Hydraulic turbines, storage pumps and pump-turbines – Rehabilitation and performance improvement*, a guide developed to assist in identifying, evaluating and executing rehabilitation and performance improvement projects including life extension options of components and improved future efficiency interventions. These result from progress made in new materials and technology and help account for future budgeting and planning needs. The MT (Maintenance Team) is presently revising publication IEC 62256 to include further identification methods and details for life extension planning of turbine components. Upgrading existing hydropower plant projects and reviewing the lifespan expectancy of their valuable equipment offer further options for cost-effective increases in generation capacity. In the context of renewable energies, the notion of rehabilitation is particularly interesting in that many of the centres already in existence, or used in the past, can be modernized with relatively little additional expenditure, not only to increase

production of energy, but also to reduce maintenance costs. Extending plans to also include drinking water or irrigation supplies helps generate additional sources of energy that only have minimal environmental impact.

In addition to the high revenues that can be obtained from clean energy generation, there is also the aspect of low maintenance costs. High performance hydropower equipment can frequently run without interruption for extended periods of time. Thus even the smallest improvements in efficiency over this long lifespan have an important financial impact. Indeed, most of the major components of large turbines and hydro generators return to service after their second overhaul and 70 years of continuous operation. In this respect, two publications within the remit of TC 4 stand out as being important: IEC 60193, *Hydraulic turbines, storage pumps and pump-turbines - Model acceptance tests*, at design stage, and IEC 60041, *Field acceptance tests to determine the hydraulic performance of hydraulic turbines, storage pumps and pump-turbines*. Other valuable work is being carried out by WGs involved in areas such as design, installation and particle erosion to name but a few.

Since any hydroelectric project is by essence a long-term investment, whether it concerns new construction or the rehabilitation, replacement or upgrading of previous installations, relevant standards have to be technically irrefragable and aim for the highest levels of performance and durability. By striving for excellence, the future of hydropower looks bright and likely to resist the many reorganizations typical of any highly technical industry.

Benefit from performance improvements

As newer and more technically ambitious hydroelectric installations continue to come into existence, so the long lifespan of the present existing installations also provides additional opportunities to benefit from the research and

developments made in the efficiency of hydro equipment technology.

As far as normal wear and tear of hydroelectric equipment is concerned, there are several areas where standardization plays a major role. One of these is pitting due to cavitation. The specification of new design methods and use of numerically controlled manufacturing tools have virtually eliminated this. However, there are as yet no standards dealing with abrasion from particle erosion. One of the tasks of WG 29 is to work on particle erosion, defining erosion rates, hard coating effectiveness versus consequent efficiency drop, erosion guarantee evaluation and unit availability.

There are other areas that also require attention, such as those of vibration and stability, particularly for plant operators of Francis and pump turbines, both for upgrades and new units. Standards have been updated for specifying and testing speed control systems and those for unit and plant control systems face rapid and constant evolution, both on the hardware side and in communication protocols.

Another element that influences the need for standardization is the change in manufacturing, more specifically the extended subcontracting of work which was formerly done in-house by the supplier. Globalization of turbine suppliers and subcontractors means that there are newcomers to the market who are not necessarily as specialized as they were in the past. In this respect, standards and guides can only help ensure the quality of the equipment and contribute to making the world a more environmentally friendly and sustainable place.

Today, TC 4 has a total of 32 country members, with 18 Participating (P) countries and 14 Observer (O) countries. Together they account for over 115 active technical experts who contribute to the advancement of IEC hydroelectric standards and represent most of the major contenders of hydroelectricity in the world, including China, Canada, the United States of America and the Russian Federation.

The future is bright, the future is flat

Flat panel displays dominate the multimedia and ICT markets

Displays are central to all multimedia, ICT (information and communication technology) and to a large number of other devices and systems, such as digital still cameras, mobile phones, digital signage and cash or vending machines. FPD (flat panel display) technology is now being used in all of these. IEC TC (Technical Committee) 110: Electronic display devices, plays an essential role in this development by preparing International Standards for all types of electronic display devices, excluding cathode ray tubes.



3D TV set (Photo: Samsung)

From cathode ray to flat panel

Opinions differ regarding as to precisely when and where television was invented. However, what is certain is that its development (from the mid-1930s) was made possible thanks to the arrival of CRT (cathode ray tube) displays. CRT consists of an electron gun that fires electrons onto a phosphor-coated screen to produce moving images. CRT displays, first monochrome, then colour, were the unique choice for television sets, computers and other systems for nearly 60 years before being phased out relatively rapidly by FPDs.

Swift shift in IT

Compared to CRT-based TV sets, which delivered a wide range of colours, the first CRT monitors for IT equipment, which were limited by inadequate graphic cards, were monochrome and didn't provide good or sharp pictures. Colour CRT monitors for IT equipment first appeared in the early 1980s.

FPDs were initially used in laptop computers, in the form of monochrome LCD (liquid crystal display) screens. Their limited size, weight and power consumption made them a much better

choice than the CRT displays used in the first "portable" computers, which weighed well over 10 kilos. The first standalone flat panel displays for computers were introduced in the mid-1990s, but were quite expensive at the time. However, their widespread adoption followed quickly as their price dropped and as they offered many advantages over CRT monitors, including lower power consumption and a smaller footprint, major benefits in business environments where space is at a premium. From the mid-2000s, LCD screens, initially offered in the 4:3 aspect ratio, like CRT displays, became available in the wider 16:9 format.

Slower transition in television

Whilst CRT displays were replaced fairly rapidly by FPDs in IT equipment, consumers were more reluctant to adopt so-called flat-screen TVs. A 2002 document from the EBU (European Broadcasting Union) Technical Department noted that flat panel displays were just starting to make inroads into domestic TV households. "CRTs still take 99 % of the market," the report said. Yet, less than ten years later, the share of

CRT TVs had dropped to 10 % of worldwide shipments of sets.

The slow initial take-up rate of FPDs for TV sets was mainly due to the high prices of the first large flat TV screens, originally PDP (Plasma Display Panel), and to the protracted preparation and slow publication of international digital and HDTV (High-Definition Television) standards and the resulting lack of sufficient and suitable content in the appropriate 16:9 format.

However, the sale of FPD TV sets then picked up rapidly, driven by lower prices of LCDs and the wide range of screen sizes, extending from under 20 inches (making them ideal replacements for CRTs in low-income countries) all the way to over 40 inches (suitable for high-income markets). New international TV standards, leading to the widespread introduction of content required by multichannel (digital) households and HDTV, also helped boost the sales of the new sets.

Multiple applications

Beyond the traditional domains of TV sets and computers, flat panel displays



Global Positioning System navigator using LCD display (Photo: Garmin)

are used in many other areas. They have enabled the spectacular expansion of mobile telephony and the emergence of entirely new devices, such as e-readers, which use EPD (electronic paper display), a technology designed to mimic the appearance of ordinary ink on paper. New FPD technologies are constantly being developed, opening up more possibilities for existing devices and paving the way for new ones.

LED (light-emitting diode) backlighting, resulting in a better image contrast and lower consumption, has been gradually introduced into LCD displays. Different technologies using LEDs, such as OLED (organic light emitting diode display), have been developed to produce new types of FPDs for mobile phones and now TV sets. Beside multimedia and ICT, many industries such as medical, retail, automotive, aeronautics and avionics and transportation rely on displays, and FPDs in particular, to operate smoothly and effectively.

TC work central to FPD expansion

The FPD market, driven by high demand in emerging economies and an expanding range of possible applications, is expected to exceed USD 102 billion by 2015.

LCD continues to be the largest product segment in the FPD market while the

more recent OLED technology, driven by applications in mobile phones and television, represents the fastest growing sector.

TC 110 prepares International Standards in the field of electronic display devices (excluding CRTs) and specific relevant components. It works on terms and definitions, letter symbols, essential ratings and characteristics, measuring methods, specifications for quality assurance and related test methods, and reliability.

It was initially established as SC (Subcommittee) 47C in 1998 under TC 47: Semiconductor devices, focusing on standards development in the area of flat panel display. It was transformed into a full TC in June 2003 when it began to encompass standardization work in OLED, 3DDD (3 dimensional display devices for 3DTV), EPD or non-volatile display devices, FDD (flexible display devices) and other emerging technologies.

To cover all devices, TC 110 established six WG (Working Groups), each one dealing with a specific area: LCD, PDP, OLED, 3DDD, EPD and FDD. TC 110 also set up project teams to prepare standards for back light units for LCD devices.

TC 110 works closely with a number of TCs, in particular TC 100: Audio, video and multimedia systems and equipment. As regulations in most countries now require reducing waste material and energy use through recycling, reuse of components and more energy-efficient appliances, it also works closely with

TC 111: Environmental standardization for electrical and electronic products and systems.

Extensive and global network

The global significance and impact of TC 110 activities are illustrated by its relationship with many important international bodies. It works with subcommittees of the CISPR (International special committee on radio interference). CISPR is an organization within the IEC that was established to consider the protection of radio reception from interference. Its members include CIGRE (International Conference on Large Electric Systems), the EBU, ETSI (European Telecommunication Standards Institute), IARU (International Amateur Radio Union) and ITU-R (International Telecommunication Union, Radio Sector).

TC 110 also collaborates with the CIE (International Commission on Illumination) and ISO (International Organization for Standardization) TC 159/SC4: General ergonomics principles.

Two-track approach

TC 110 Secretary Masao Uehara says that work to improve FPDs follows two tracks. The first is to improve FPD performance for both resolution and colour space. The second concerns the development of new technologies and improvement of existing ones.

As regards resolution, there is still scope for improvement. Japan's public broadcaster, NHK, has developed the UHDTV (ultra HDTV) digital video format, which offers 16 times the number of pixels of HDTV. UHDTV displays, which are much larger than current HDTV screens, have been demonstrated at various professional shows such as the 2006 and 2008 IBC

(International Broadcasting Convention), Amsterdam, Netherlands, or the 2009 and 2012 International CES (Consumer Electronics Show), Las Vegas, United States.

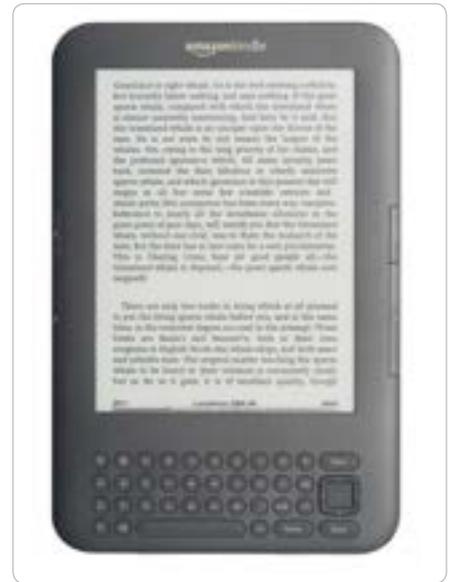
The objective is to introduce UHDTV in homes between 2016 and 2020. However, technical questions remain with regard to the availability of content and the bandwidth to transmit that content.

Uehara says that performance can also be improved in the rendering of colours and other optical aspects that still do not match the whole range of human visual acuity.

The second track of TC 110 work concerns technologies, the objectives being to

improve existing ones, such as HDTV, 3DTV or touch screens, and to develop new technologies. The latter include OLED, with AMOLED (active matrix OLED) [see article in this *e-tech*], in particular, offering significant prospects for better TV and mobile devices displays, as well as foldable and flexible displays.

With the growing global appetite for higher quality and new functions in multimedia devices, the range of applications and demand for FPDs keep expanding. To support this expansion, TC 110, which has so far published over 30 International Standards, can expect a significant workload over coming years.



e-reader (Amazon's Kindle), paper-like feeling with EPD (electronic paper display)

TC work sustains media expansion

Harmonization through collaboration with other relevant bodies

The audio-visual and multimedia sectors contain some of the world's most dynamic and productive industries. They are not limited to manufacturing systems and products for professionals and consumers, but also include an entire global and highly valuable content production chain in the entertainment, broadcasting, ICT and telecommunication domains. Expansion of both equipment and content sectors is made possible in no small measure by the work of several IEC TCs (Technical Committees), in particular that of TC 100: audio, video and multimedia systems and equipment.

Huge market – complex standardization

Nearly every individual in the world has access to some kind of AV (audio-visual)

device. In addition, an ever larger number of households possess multimedia systems. Multimedia is the integration of any form of audio, video, graphics, data and telecommunication. This integration includes the production, storage, processing, transmission, display and reproduction of such information, and requires special equipment.

According to market estimates from GfK Boutique Research and the US (United States) Consumer Electronics Association, global sales of consumer electronics goods will exceed USD 1 000 billion for the first time ever in 2012, up 5% on 2011. Most of the systems and equipment in these categories rely on International Standards prepared by TC 100.

Given the broad range of equipment and systems produced for and used in the audio, video and multimedia

sectors, many organizations besides the IEC, such as the ITU (International Telecommunication Union) or ISO (International Organization for Standardization) are also developing standards for these. TC 100 maintains an extensive network of liaisons at different levels with many of these organizations,



Computer monitor (Photo: LG)



Internet protocol-based set-top box
(Photo: Comtrend)

so as to avoid duplication with existing standards.

A tale of three TCs

TC 100 was established in 1995 through the merger of three IEC TCs and of some of their SCs (subcommittees) that prepared International Standards for AV receiving, audio and distribution equipment.

The scope of TC 100 is “to prepare international publications in the field of audio, video and multimedia systems and equipment. These publications mainly include specification of the performance, methods of measurement for consumer and professional equipment and their application in systems and its interoperability with other systems or equipment.”

TC 100 lists as its two major objectives for the next 3 - 5 years:

- to enrich human life with entertainment provided by audio, video and multimedia in the home and networked environments; and
- to contribute to society by pursuing energy efficiency, working on Smart Grid solutions and environmentally conscious design, and by addressing options for accessibility through the use of “disability person conscious design” for audio, video and multimedia equipment.

Flexible structure, quicker process

The audio, video and multimedia markets are fast-moving environments with manufacturers constantly rolling out new products and consumers renewing their equipment or acquiring devices such as tablets, e-book readers, or so-called smart phones, to access content. A lengthy standardization process would hold up the production and adoption of new equipment. TC 100 has adopted a flexible organization structure and effective working style to speed up approval.

All the standards are developed by Project Teams that are grouped by TAs (Technical Areas), which work like SCs. TAs are established and disbanded flexibly; currently there are 12 of them.

In addition, TC 100 has two advisory groups, AGS (Advisory Group on

Strategy) and AGM (Advisory Group on Management), and a GMT (General Maintenance Team) that maintains all international publications within the scope of TC 100.

Web of relationships

Besides the IEC, many organizations, consortia and fora work on standards in the audio, video and multimedia domains; there is therefore a certain risk of duplication between them.

Collaboration is essential as some of these bodies may work on completely different but relevant categories of standards, for certain types of connectors and cables, or content formats for production and distribution. Many systems present similar technical specifications, so having common electrotechnical standards is essential to ensure equipment compatibility across different standards in other domains. This allows economies of scale and global harmonization of systems that will eventually benefit manufacturers and consumers alike.

Priority liaisons are established with establishments that have a work programme directly related to TC 100 activities. Their work needs to be monitored carefully as complementary future work items in TC 100 might arise. TC 100 also maintains liaisons at a lower level with other international or regional standard-setting bodies. Dependency, another level of relationship without a formal liaison, is maintained with organizations that are important for TC 100 work.

Future orientated

New TAs are established as required when needed to meet the challenges of the dynamic AV and multimedia sectors. Recent examples of this are the creation of TA 13 and TA 14, and the wider scope assigned to TA 12.

The new TA 13 is tasked with dealing with environmental aspects in the field of AV and ICT equipment, including projects



Samsung HT-AS730 home theatre system

transferred from the Environmental WG (Working Group) of TC 108: Safety of electronic equipment within the field of AV and ICT.

TA 14 prepares International Standards for interfaces and methods of measurement for personal computing equipment.

As for TA 12, its scope, which dealt initially with AV energy efficiency, was widened to include "development of standards related to Smart Grid and home energy management applications in networked multimedia equipment for the purpose of energy measurement and savings."

Heavy workload

The constantly expanding range of applications for AV and multimedia systems and the fast-changing pace of the industry mean that TC 100, already one of the most prolific IEC TCs, has a full agenda. Its standardization work for AV and multimedia systems implies being both a user and customer of standards from other TCs and SCs, such as TC 110: Electronic display devices (see article in this *e-tech*), or TC 86: Fibre optics (see article in *e-tech* November 2011), to name just two.

TC 100 also contributes to work by SMB (Standardization Management

Board) SGs (Strategic Groups) on Smart Grid, LVDC (low-voltage direct current) distribution systems up to 1500V, and AAL (Ambient Assisted Living).

As of February 2012, TC 100 had released 395 publications and had 48 active projects under way.

TC 100 is set to remain very busy for the foreseeable future, given the demand and expansion of the AV and multimedia sectors, fed by the merger of technology and content, the latter becoming available across many different devices and platforms.

TC 100 web of relationships

Priority liaisons with organizations that have a work programme directly related to its activities.

These include, among others: ITU-R (Radiocommunication Sector); ITU-T (Telecommunication Standardization Sector); ISO/IEC JTC (Joint TC) 1;

and SMPTE (Society of Motion Picture and Television Engineers).

Liaisons at a lower level with other regional or international standard-setting bodies, such as the CIE (International Commission on

Illumination), ATSC (Advanced Television Systems Committee) US, DLNA (Digital Living Network Alliance), DVB (Digital Video Broadcasting Project), or the EBU (European Broadcasting Union) Technical Department.

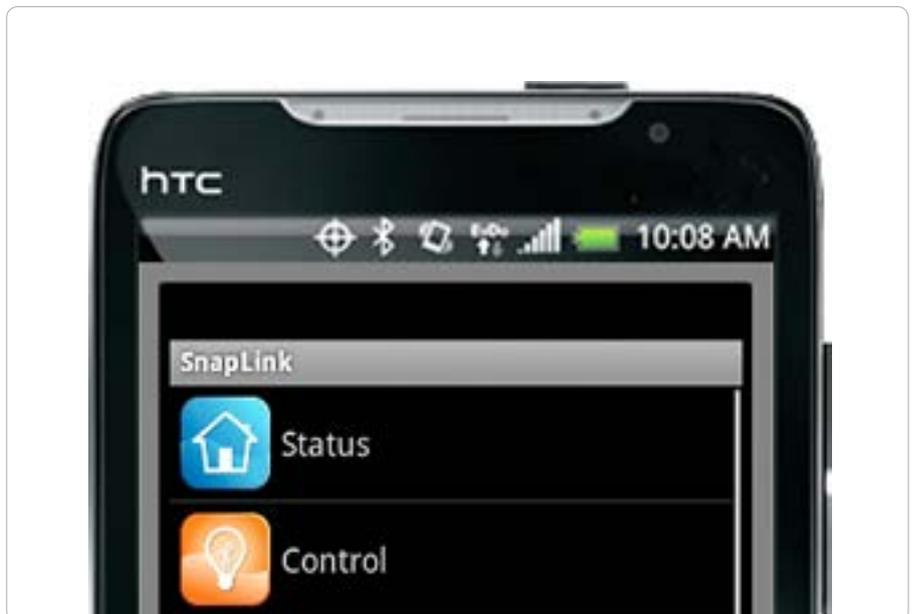
Plug and play

Enabling the smart home and office

Seamlessly switching off lights, turning on heating or cooling remotely, communicate or listen to music that follows you as you move from room to room, this not only requires smart devices but communication protocols that can cross different makes and technologies.

Smarter devices everywhere

At CES 2012 the connected home was featured both as a communication hub



Communication protocols are essential for home network systems to work

that allows consumers to stay in touch when they're on the road as well as allowing them to reach out to the world, when they're at home. Smart devices in the home will also enable increased energy efficiency by remotely turning off lights, closing shutters or controlling smart applications and appliances via the Internet.

The ability to communicate with each other

Visiting the connected home on display in South Hall 2 at CES, visitors discovered a multitude of devices, including smart TVs and household appliances, interactive energy control panels, low energy lighting solutions and more. None of them would be effective without the ability to communicate with each other. UPnP (Universal Plug and Play) technology allows devices to seamlessly cross multivendor and multi-technology networks. UPnP together with enabling home automation technologies such as KNX (ISO/IEC 14543-3) or Echonet (ISO/IEC 14543-4) allows devices to connect and work together, facilitating multiple applications like entertainment, energy efficiency, security and building control, through data and resource sharing, communications, the Internet and simplified network establishment.

Vendor and technology independent

The new International Standard ISO/IEC 29341, *Information technology – UPnP Device Architecture* describes the architecture for home connectivity of intelligent appliances, audio and video equipment, wireless devices and PCs. The multi-part standard allows a user interface for, and a bridge to, intelligent appliances and Home Electronic Systems. It enables the seamless connection and handles the interworking of AV and sensors for lighting, heating, cooling, shading, security and multiple applications no matter which manufacturer, as long as products comply with the standard. Device control protocols are built upon established, open, internet-based communication standards such as TCP/IP, UDP, HTTP, XML, etc.



UPnP allows smart appliances to communicate with each other (Photo: LG)

“The UPnP Device Architecture is designed to support zero-configuration, ‘invisible’ networking and automatic discovery for a breadth of device categories in the area of audio, video and data from a wide range of vendors,” explains Dr Walter von Pattay, Secretary of the committee that developed the standard. “The real plus is that it’s network independent, does not require device drivers, can be implemented using any programming language or operating system and supports a wide range of applications from AV to Home Electronic Systems that operate lights, shutters, control climate and many other things.”

Von Pattay adds, “ISO/IEC 29341 will help manufacturers from around the world to comply with the specifications required to make this technology work, so that any compatible device from any vendor can dynamically join/leave a network and interoperate seamlessly.”

The standard is composed of several parts. The first part, ISO/IEC 29341-1, *Information technology – UPnP device architecture – Part 1: UPnP Device Architecture Version 1.0* establishes the fundamental principles and base architecture.



Communication protocols are essential for home network systems to work

Additional parts define specific applications and devices. The latest include:

- ISO/IEC 29341-4-10, *Information technology – UPnP Device Architecture – Part 4-10: Audio Video Device Control Protocol – Level 2 – Audio Video Transport Service*
- ISO/IEC 29341-4-11, *Information technology – UPnP Device Architecture – Part 4-11: Audio Video Device Control Protocol – Level 2 – Connection Manager Service*
- ISO/IEC 29341-4-13, *Information technology – UPnP Device Architecture – Part 4-13: Audio Video Device Control Protocol – Level 2 – Rendering Control Service*
- ISO/IEC 29341-4-14, *Information technology – UPnP Device Architecture – Part 4-14: Audio Video Device Control Protocol – Level 2 – Scheduled Recording Service*

ISO/IEC 29341 was developed by the IEC and ISO within joint technical committee ISO/IEC JTC 1/SC (Subcommittee) 25: Information technology – Interconnection of information technology equipment.

UPnP is a big step forward bringing flexible standards-based connectivity to *ad-hoc* or unmanaged networks in the home, office or public spaces.

From text to speech for pleasure

Audiobooks: bringing literary works to all audiences

Written works have been central to the culture of many civilizations for centuries. However, their main vehicle, print, has meant that they have not been accessible to all, the visually-impaired in particular. Audiobooks, which first appeared in the early 1930s on long-playing records, aimed initially at remedying this. Audiobooks are now reaching an ever wider audience thanks to the emergence of digital platforms and distribution channels. A recent IEC International Standard defines the file format requirements and structures for digital audiobook media.



Audiobooks are proving ever more popular

Not that new

While print form has been most commonly encountered, some works were recorded in very limited numbers as audio documents on wax cylinders as far back as the early 20th century. Audiobooks as such first appeared in the early 1930s, on LPs (long-playing records) initially aimed at the visually-impaired. In 1933 the American Foundation for the Blind developed the first long-playing record and player to provide books in audio format to people of all ages who had disabilities that prevented them from reading standard print books.

Beyond the visually impaired

Audiobooks on LPs later extended beyond the world of the visually-impaired to reach schools and libraries. The invention and widespread adoption of the compact audio cassette, in the mid to late 1960s, provided an ideal platform for audiobooks to reach the general public. Cassettes were tougher and easier to use than LPs and could be played while on the move and in cars. This led to the growing popularity of audiobooks, which now reach a wide public, young and adults alike.



The first audiobooks were recorded on LPs

Surveys show that US audiobook listeners are well-educated and avid readers. On average they read 15 print books a year compared with only 6 for people who don't listen to audiobooks. Contrary to common perception, audiobooks are also drawing in young adults in large numbers;

almost a quarter of listeners are between 18 and 24.

However, if audiobooks are now available for all audiences, the market is in no way global. Audiobooks are very popular in the US, where more than 6 200 were published in 2010 and where the

total value of the industry in 2009 was estimated at USD 900 million, with sales of 20 million audiobooks that year. Audiobooks are also popular in the United Kingdom, Germany, Poland and the Nordic countries (more than 10% of the overall book market), but are virtually non-existent in French-speaking countries (accounting for just 0,7% of France's book market in 2008, although the figure is growing) .

Evolving formats bring the end of the physical medium

The introduction of digital audio and of its initial storage mechanism, the CD (compact disc), didn't lead to the immediate demise of the compact cassette as the most popular platform for audiobooks. CDs may have superior audio quality, but compact cassettes remain in the same position when stopped, making it possible to resume listening later from the same point. Audiobooks on CD only became more popular after CD players widely replaced their audio cassette counterparts, in particular in cars where most audiobook listening is done.

The migration of digital audio files from a set physical medium (CD) to online electronic distribution had a momentous impact for the music industry and for audiobooks as well. The files are now available in a number of distinctive formats that can be played on different devices. In the biggest market, downloads are quickly catching up with CDs, which until now have constituted the primary source of audiobooks, with compact cassettes now representing only approximately 1% of total sales.

The need for standards

The need to define the audiobook electronic file format structure to ensure compatibility with music industry and multimedia standards, as well as how to present and navigate an audiobook effectively, led TA (Technical Area) 10: Multimedia e-publishing and e-book technologies, of TC (technical committee) 100: Audio, video and multimedia systems and equipment, to prepare an International Standard.

IEC 62571, *Digital audiobook file format and player requirements*, was published in early 2011. It "defines requirements and provides recommendations to publishers, software developers, content providers, and hardware manufacturers for the data structure, usability requirements, playback systems and delivery systems for audiobooks in digital file format."

Broad definition, complex structure

IEC 62571 describes the term audiobook "as any audio file or collection of audio files of primarily spoken word content that are played in a linear or specified order. Therefore, spoken word audio with occasional music, a narration of newspaper articles, or other similar spoken word audio is assimilated to audiobooks in this standard."

As digital audiobooks and their associated characteristics predate publication of this International Standard, TA 10 presents IEC 62571 as "a compilation standard that straddles early binary architectures represented by earlier versions of ANSI (American National Standards Institute) CEA-2003 [standard], and newer XML architectures."

The standard defines the audiobook player and file format structure requirements and specifications. It also describes and lists extensively the complex characteristics of tags, metadata and other information that apply to audiobooks and are required to describe the content, author, narrator, to give copyright and other information, and to navigate through the playlist.

"Creating the best listening experience"

If e-books and e-readers have become a global phenomenon, the lesser known audiobooks are also experiencing healthy growth in certain markets. TA 10 aims at contributing to this success. Its stated goal in preparing IEC 62571 was "to create a broad, extensible standard for audiobook publishers, audiobook device manufacturers, and audiobook software developers in order to create the best listening experience for the audiobook consumer."



Analogue to digital: listening to audiobooks anywhere with an MP3 player (Photo: Sandisk)

OLED technology flexes its muscles

New flat panel display technology set to take market by storm

At this year's CES (Consumer Electronics Show) in Las Vegas, a display technology that drew particular attention was OLED (organic light emitting diode). It currently represents only a tiny proportion of flat panels, used mainly in smartphones and tablet computers, but this is set to change dramatically, as it is now ready to compete in the computer and TV markets. A new IEC International Standard specifies measuring methods of visual quality and ambient performance for OLED display modules and panels.

Bright and wide

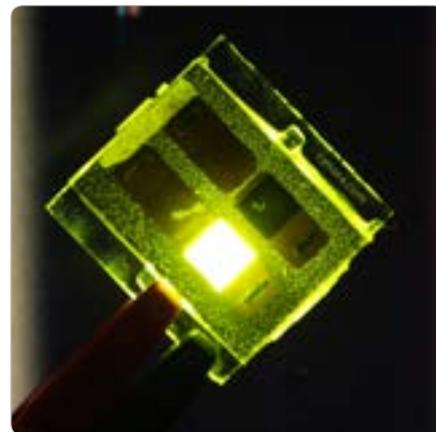
OLED displays can provide high contrast ratio, fast-response time, wide colour gamut, and a wide viewing angle while operating with low power consumption. In addition, OLED technology enables the production of thin devices that can be both flexible and transparent. This makes OLED displays ideal for mobile devices. Large-scale production of AMOLED (active matrix OLED) displays helped drive high-volume sales of certain models of smartphones (see article on OLED technology in this *e-tech*).

OLED technology, initially limited to small screens, made great progress in 2011 and is now expected to be introduced in computer monitors and TV sets. The first large (55 inch) market-ready TVs were unveiled at the 2012 CES.

OLED display revenues are estimated to be around USD4 billion in 2011 (about 4 % of flat panel display revenues) and are forecast to exceed USD 20 billion (approximately 16% of the total display sector) by 2018.



Flexible OLEDs will be found in many devices in the near future



Green OLED module

Expansion made possible by standards

This expansion of the OLED industry is made possible in no small part by the work of TC (Technical Committee) 110: Electronic display devices (see article on TC 110 in this *e-tech*). TC 110 recently published a new International Standard, IEC 62341-6-2, *OLED displays – Measuring methods of visual quality and ambient performance*. This International Standard, the fifth in the

62341 series, is mainly applicable to colour display modules.

Comprehensive measurements

The document “specifies the standard measurement conditions and methods for determining the visual quality and ambient performance of OLED display modules and panels”. It describes the environmental and lighting conditions (dark-room and ambient-illumination).



OLED are widely available on portable devices (Photo: Samsung)

IN STORE

It also lists the requirements for human visual inspection of static images for different types of visible defects, stressing that “human visual inspection and comparison against limit samples remains the most universal system for grading and classification of visual defects”.

To illustrate the various issues, this International Standard gives sample images of visible defects and various diagrams and figures, such as an example of visual inspection room setup for control of ambient room lighting and reflections.

This International Standard, like others in the same series, will help manufacturers of OLED modules and displays produce high-quality products and will represent a guarantee for consumers of devices with OLED displays.

Exclusive IEC solar charger

IEC Webstore competition winners announced

In November 2011, the IEC Webstore launched an end-of-year competition. During the last two months of 2011, any customer who placed an order on the IEC Webstore had the chance to win one of the latest, innovative and most exclusive IEC branded universal solar chargers

Hundreds of responses received

The response to the competition was huge. In November alone, 968 people qualified for the draw, then in December a further 807 customers placed their orders on the IEC Webstore.

The IEC Customer Service team kept track of what was happening and relayed the news on their Twitter account, https://twitter.com/iec_csc, putting a photo on the IEC Facebook page.

Lucky green touch winners

At the beginning of January 2012 the names of the ten lucky winners were “drawn out of the hat”.

So, today, there are ten new owners of an IEC branded universal solar charger. They are able to connect and recharge their various devices using renewable energy generated by the sun in all four corners of the earth. Congratulations to all those lucky winners!



IEC solar charger includes 6 adaptors for leading portable phone brands



IEC Customer Service Twitter account: @iec_csc



Sensors and safety

Indispensable everywhere and in everything

Issue 02/2012 of *e-tech* will focus on sensors and safety. Sensors are used to measure data and convert them into signals that are communicated to a system. Most sensors are used to measure light, temperature, touch, sound, position and magnetism. Others are used to measure speed pressure, flow or are capable of recognizing images.

Sensors are becoming more complex, providing support for various modes of operation and interfacing. They are used in a wide variety of devices, such as touch-sensitive elevator buttons (tactile sensor) and lamps which dim or brighten by touching the base. They are also part of a multitude of applications, including multimedia, home appliances, cars, machines, aerospace, medicine, manufacturing and robotics.





e-tech

News & views from the IEC

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