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Tech trends 2018

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INDUSTRY SPOTLIGHT

Baby tech boom

IEC WORLD

Standards are key to the
evolution of smart cities

Multimedia & consumer electronics

Machine superintelligence will soon be a reality



The future's intelligent

Artificial intelligence is one trend that's here to stay

By Zoë Smart

The beginning of the year is always a time for predictions and wild speculations about what the next 12 months have in store for humankind. This is particularly the case in the technology sector where events such as the International Consumer Electronics Show (CES) in Las Vegas promise the next revolution in wearables or virtual reality or whatever the buzzword of that particular year is.

While some of these technologies are developing at a much slower pace than their manufacturers would have us believe, and others end up dying a slow death, there is no doubt that we are experiencing big leaps in the sciences and technology.

Take artificial intelligence (AI); while robots aren't roaming the streets just yet and there is still some way to go before machines are as intelligent as humans in all areas, for example reasoning and thinking abstractly, AI that specializes in one area (also known as Artificial Narrow Intelligence or ANI) is behind an impressive array of technologies.

Examples include voice-activated assistants such as Alexa and Siri, smart home products such as Google's Nest and the new generation of self-driving cars whose predictive capabilities are being continuously refined thanks to an ever-increasing amount of available data. It is thanks to this dataset that machines are



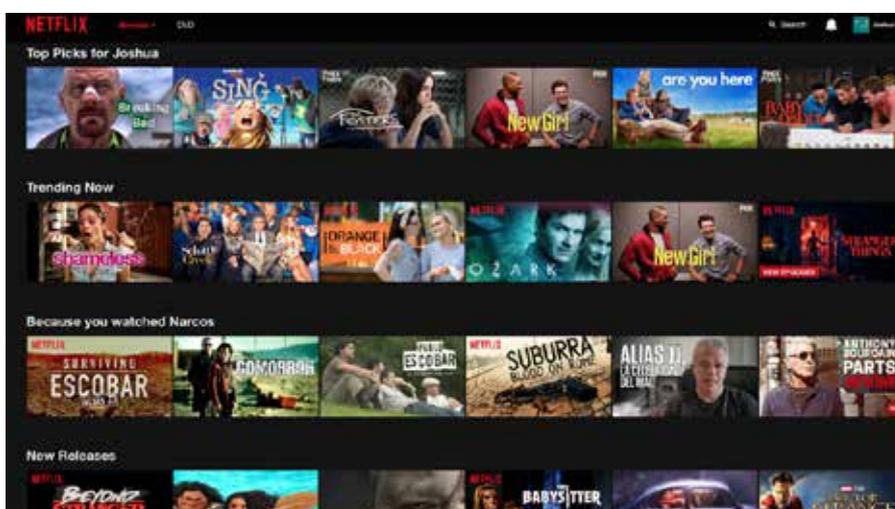
Zoë Smart, Managing Editor e-tech

becoming better and faster at predicting our likes and dislikes; Netflix and Amazon are cases in point.

Truly intelligent machines that can compete with and easily outperform the human brain may seem like a long way off from a smart speaker that can dim the lights for us, but experts in the field agree that machine superintelligence is actually right around the corner.

While sceptics talk about job losses and ultimately a very real threat to humanity, its champions argue that AI will be what liberates us from repetitive tasks, allowing us the time to further our own intelligence and creative thinking.

Only time will tell who is right and who is wrong but one thing is for certain – the only way for AI is forward.



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Other themes of issue 1 include smart cities and the need for cooperation, celebrating winning an Emmy Award for our work with ISO and ITU on MPEG-4, and presenting the first publications for solar thermal electric plants.



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CES technology trends for 2018

AI technologies drive innovation

By Natalie Mouyal

Early on each New Year, technology companies gather in Las Vegas for the annual CES show. The 2018 edition brought together 3 900 exhibitors displaying their latest developments. Analysts from the show organizer, the Consumer Technology Association (CTA), provided an overview of the major trends to follow this year.

Data will be used to fuel the next generation of products and services. From smart cities to self-driving cars, technology is needed that can allow devices and services to access great volumes of data. According to CTA market researchers Steve Koenig and Lesley Rohrbaugh, 5G wireless and artificial intelligence (AI) herald this new age of data.

Already, the proliferation of smart, connected devices has generated significant volumes of data. And these volumes will only increase. According to Intel chief executive officer (CEO) Brian Krzanich, the average person will generate 1,5 GB of data each day by 2020 compared with 650 MB in 2016. Self-driving cars with their cameras and sensors will generate

approximately 4 TB of data each day. In their presentation to the media, Koenig and Rohrbaugh identified eight key trends for 2018 that will be fuelled by access to data.

5G – the 5th generation wireless system

Imagine loading the two-hour film *Guardians of the Galaxy* in 3,6 seconds compared with the six minutes required with the current fourth generation (4G) network (at 100 Mb/s). This will be possible using the next generation wireless telecommunications system, 5G, which promises higher speeds, lower latency and greater capacity than the current mobile system.

Currently, 5G field tests are underway around the world and several operators have already announced plans for commercial rollout in 2019. According to Koenig and Rohrbaugh, 5G systems will be essential for wireless virtual reality, self-driving cars and smart cities.

Artificial Intelligence

In our homes, voice activated ‘assistants’ control connected

devices such as lamps, door locks, thermostats, refrigerators and washing machines. They order our groceries online and play our favourite music. The popularity of these ‘assistants’ is growing, with one in six people owning a smart speaker in the United States, according to a report from NPR and Edison Research. Recent improvements to the functionality of voice activated assistants have helped enhance their spread.

Businesses rely on AI applications to process data, detect and deter security intrusions, automate certain tasks, resolve customer service issues and personalize promotions. In a survey of 240 information technology (IT) and business decision makers, 80% reported that they are currently using AI technologies and 30% plan to



Leka robots are designed to help children with developmental disabilities (Photo: Leka)

increase spending on AI technologies over the next three years.

The Joint Technical Committee of IEC and ISO on information technology (ISO/IEC JTC 1) and several of its subcommittees (SCs) prepare International Standards for artificial intelligence. Given the rapid developments in AI across many industries, a new subcommittee (SC) on artificial intelligence, ISO/IEC JTC 1/SC 42, was set up in 2017 with the mandate of providing standardization in the area of AI as well as guidance to other committees developing AI applications.

Robotics

This year at CES, exhibitors showcased a variety of robots

targeting the consumer market. Known as smart tech, these robots provide a specialized set of skills. Examples include robots that can help you sleep by mimicking the rhythm of breathing and playing lullabies, can provide home surveillance by taking and sending videos when their motion sensors are activated or can vacuum the floor and put away clutter.

Increasingly, manufacturers are aspiring to design robots with more sympathetic characteristics that will allow them to become a family friend and respond to human touch and voice.

IEC produces International Standards for many of the advanced technologies that robots incorporate, such as voice

recognition. IEC work also covers the internet of things (IoT), navigation and hardware products such as cameras, lights, speakers and microphones.

Biometrics

Body measurements and calculations – biometrics – can be used as a form of identification. Increasingly, these measurements are incorporated into the technology we use by providing enhanced authentication and access control. Facial recognition and iris scanning can provide access to your smartphone and start your car, thumb-prints can open your padlock and voice recognition can protect your wallet.

Voice has quickly become a popular user interface. Not only are voice commands used to control various

devices in the home but also to order products online through smart speakers. These applications rely upon Standards developed by ISO/IEC JTC 1/SC 37 for generic biometric technologies including voice and facial recognition. Other IEC Standards that can be used for biometrics include electronic display devices (IEC TC 110) and sensors (IEC TC 47).

Biometric technologies raise concerns regarding privacy and data protection. Biometric data stored in a central database might be used for purposes other than the one originally intended. ISO/IEC JTC 1/SC 27: IT security techniques, has developed the ISO/IEC 27000 family of International Standards for information security management systems (ISMS) to enable organizations to keep their data assets secure.

Virtual reality and augmented reality

The market for virtual reality (VR) has expanded from the consumer and gaming market to business applications. It can be used to model manufacturing prototypes, provide training for first aid responders or help customers make purchasing decisions by experiencing a product or service virtually. Similarly, augmented reality (AR) is becoming an increasingly popular tool with consumers and businesses. It facilitates shopping by allowing customers to try on clothing virtually or 'see' furnishings inside their home.

According to analysts at IDC, worldwide spending on AR/VR is forecast to reach USD 17,8 billion in 2018, an increase of nearly 95% over the USD 9,1 billion expected for 2017.

At CES, exhibitors demonstrated that the VR ecosystem is expanding with new products such as VR-specific headphones, charging stations,



Manufacturers are increasingly targeting the consumer market with their robots (Photo: Kuri)

and content subscription sites. One innovative service combined a VR headset with a specialized weight resistance machine, providing the user with a complete physical workout in a video game-like environment.

ISO/IEC JTC 1/SC 24 provides Standards on interfaces for information technology-based applications relating to computer graphics and virtual reality while ISO/IEC JTC 1/SC 29 covers the coding of audio, picture and multimedia information. IEC Standards for sensors (IEC TC 47) and electronic displays (IEC TC 110) can also be applicable.

Smart cities

With the UN predicting that 66% of the world population will be living in urban areas by 2050, governments will need to find methods of optimizing public services and reducing traffic congestion. Recognizing the growing importance of smart cities, CES focused extensively on this topic for the first time this year, attracting representatives from around the world.

According to Koenig, global spending on smart cities will reach USD 34,35 billion by 2020. Examples of smart city solutions already in

use include the measurement and analysis of air quality, the monitoring of pedestrian and car traffic and the automation of street lighting. An application in London allows users to locate available parking spots easily in real time, while in Paris users can measure their exposure to noise pollution.

IEC provides many of the Standards in this area. The integration of energy generation, buildings, transportation, lighting, healthcare, and safety/security can be tailored to the needs of individual cities using hundreds of IEC International Standards

Sports innovation

Highlighting how technology is disrupting sports, CES 2018 created a new exhibition space dedicated to products and services that support athletes and their fans.

Data-driven measurements, from activity-tracking sensors that quantify physical activity to concussion-sensing mouth guards, can help athletes and coaches improve performance and reduce injury. The data collected will provide information on athletic performance, sleep patterns and nutrition which can be aggregated to develop personalized training.

Beyond the individual athlete, technology is reconfiguring sporting venues and serving as a precursor to test the technologies which are likely to be deployed for smart city solutions. By offering real-time data on parking availability and concession stand lines, for example, these smart sporting venues can be replicated in smart cities. They will rely on technologies such as the IoT for connectivity and cloud computing for the storage and retrieval of data. ISO/IEC JTC 1 has developed

International Standards for these technologies.

Digital health

Technology can be harnessed to affect health positively. It can be used to encourage behavioural change, enhance traditional medical practices such as connecting doctors and patients in rural areas and, in some cases, serve as a therapy for a health condition.

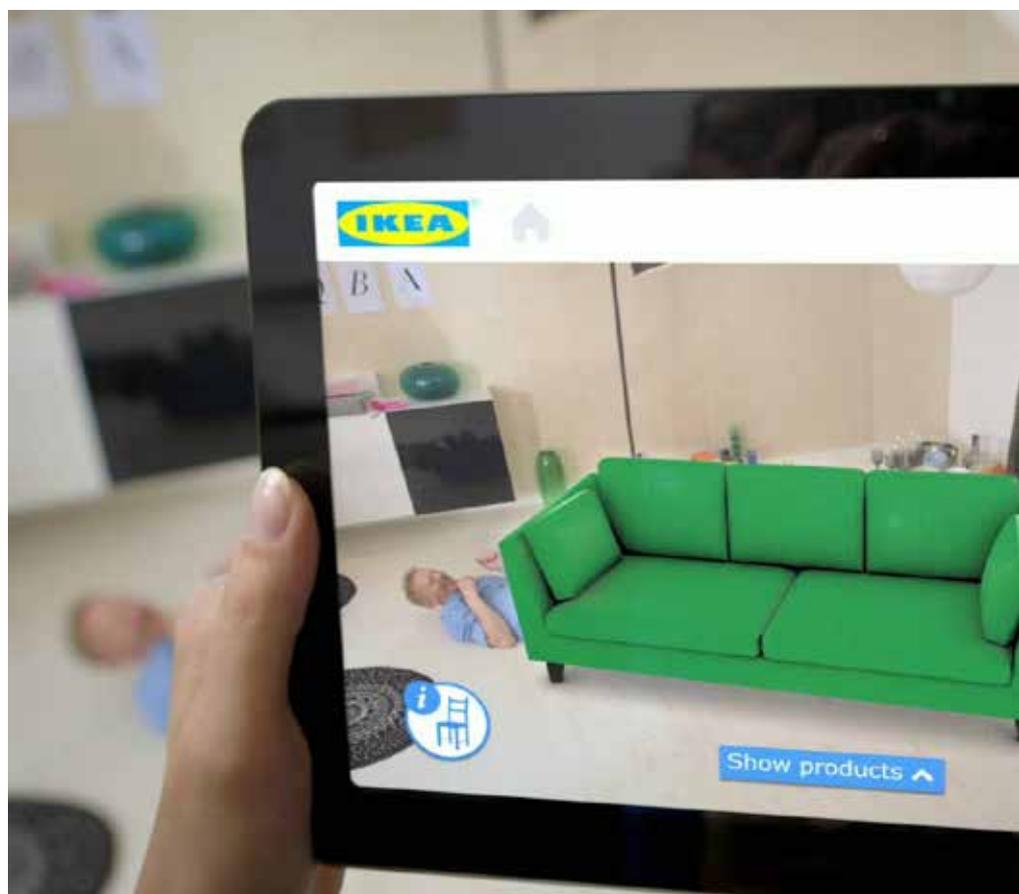
Smart medical devices and wearables continue to be developed. Some new items showcased at CES included a 'smart' insulin pen that collects and transmits key diabetes data through a mobile application and a wearable device for improving sleep by reducing tension through the performance of personalized breathing exercises. Research is also underway at the

University of Southern California to use VR to treat trauma.

CES blackout

With over 180 000 participants at CES this year and the largest exhibition spaces in its history, CES organizers declared the show a success. Yet, despite the showcasing of cutting-edge technologies and discussions about innovations for the future, the show highlighted our dependency on one basic technology – electricity.

For two hours, the Las Vegas Convention Center, which hosted the CES, lost electricity due to a flashover at one of its transformers. While no one is immune from experiencing a natural disaster such as the heavy rainfall which caused the blackout in Las Vegas, the availability of electricity remains the bedrock that underpins technology and innovation.



The IKEA furniture placement app is an example of AR technology (Photo: IKEA)

Protecting broadcast and multimedia assets and content

Media companies take action to tackle the growing threat from cyber attacks

By Morand Fachot

In recent years broadcasters and multimedia companies have come under sustained cyber attacks aimed for a variety of reasons at damaging their physical assets and pilfering their content. Broadcast and multimedia companies, content providers, vendors and trade organizations are coming together now to tackle these threats. IEC Standards play a central role in their efforts to achieve this.

Addressing cyber attacks; protecting media content

Following a spate of high profile attacks, broadcasters and multimedia companies are taking action to prevent severe and potentially irreversible damage being caused to their assets, content and business models.

This growing activity was noticeable at the September 2017 International Broadcasting Convention (IBC), the leading broadcast industry event held every year in Amsterdam. An unprecedented number of senior executives from major broadcasting and multimedia companies and from IT security solution providers

addressed closed sessions, panels and conferences to highlight the threats facing the industry and to present possible answers and solutions.

Standards developed by ISO/IEC JTC 1/SC 27: IT Security techniques, a Subcommittee of the Joint Technical Committee set up by the IEC and ISO for Information Technology, are central to protection against cyber threats.

Multimedia companies face another issue: safeguarding their work from unwanted copying and distribution outside approved frameworks. A number of Standards for digital rights management (DRM) have been developed by IEC Technical Committee (TC) 100: Audio, video and multimedia systems and equipment, and by ISO/IEC JTC 1/SC 29: Coding of audio, picture, multimedia and hypermedia information, to limit the usage of digital content and devices in such a way as to protect rights owners.

Targeting media? Nothing new!

For centuries, political authorities and other institutions everywhere

have clamped down to prevent the publication of newspapers, pamphlets and books or works of art such as films or plays, for reasons that include threats to public order, national security or indecency. Electronic media has supplied a new dimension to the distribution of news and cultural content across borders, bringing new challenges.

Many countries started broadcasts so as to reach their nationals in overseas territories and enable them to maintain links with their home country (Netherlands, 1927; France, 1931; Great Britain, 1932; Switzerland, 1935). Vatican Radio started disseminating religious broadcasts in 1931.

For other countries, the main purpose of transnational foreign language broadcasts was to spread propaganda abroad (USSR, 1929; Germany, 1933) or to undermine other countries' influence in some regions of the world (Radio Bari in Italy, 1934). Countries that felt threatened were persuaded in their turn to broadcast to foreign audiences so as to counteract propaganda and/or promote their cultural achievements.



Broadcasters and multimedia companies are taking action to face the threat posed by hackers

The Second World War, and later on, the Cold War, caused a massive expansion of such broadcasts, the emergence of clandestine and 'black propaganda' outlets and the jamming of any foreign broadcasts viewed as damaging to national interests. The USSR reportedly operated some 2 500-3 000 jamming transmitters in the 1980s.

During conflicts, broadcast media are routinely targeted. According to Serbian officials, North Atlantic Treaty Organization (NATO) forces fired more than 1 000 missiles at Serbian broadcast media facilities in 1999 during the Kosovo war, causing dozens of casualties. Broadcast media are also often among the first targets during coup attempts.

New technologies, new vulnerabilities, new forms of attack

Digital technologies have radically transformed the way broadcast and multimedia content is collected, produced and delivered. Interconnection and distribution via electronic networks have opened up new avenues, enabling a multitude of perpetrators (not always easily or quickly identifiable) to attack content producers and distributors for a wide variety of reasons.

A number of serious breaches have led broadcast and multimedia companies to look for solutions in preventing attacks and, failing this, for mitigating their impact and allowing recovery. In addition to

implementing existing standards or recommendations, these companies develop new ones, set up guidelines and increase cooperation and coordination between operators at national or regional levels and between trade organizations.

Difficulties tracing perpetrators and motives

High-profile cyber attacks have hit a number of broadcasters and entertainment companies in recent years. The following examples reflect the scope of the threats, the nature of the attacks and the range of possible perpetrators and motives:

- In November 2014, a group calling itself the Guardians of Peace



Larson Studios' servers were hacked and a USD 50 000 in bitcoins ransom demanded in late 2016 (Photo: Larson Studios)

released confidential data from the Sony Pictures entertainment company. The files made public contained, according to Sony Pictures officials quoted by Reuters, "a large amount of confidential Sony Pictures Entertainment data (...) including personnel information and business documents". Stolen data also included Sony films that had not yet been released, personal information about Sony Pictures employees as well as contracts and marketing plans that could influence competitors' strategies by exposing trade secrets. The attackers not only stole data but also "erased everything stored on 3 262 of the company's 6 797 personal computers" and wiped out 837 of its 1 555 servers. US officials blamed the attack on North Korea, implying it may have been linked to the studio's release of "The Interview", a comedy set

in North Korea about a plot to assassinate North Korean leader Kim Jong-un. This followed threats of retaliation by North Korean officials that included complaints to the White House and to the UN Secretary General. In addition to reputational damage, Sony Pictures estimated the overall cost of the attack, including restoring its financial and IT systems, at USD 35 million

- In early April 2015, French international TV broadcaster TV5Monde, which is available in 200 countries, came under a sustained cyber attack that started with a group calling itself the Cyber Caliphate claiming responsibility for messages posted on the company's social media platforms. The attack took the broadcaster's 12 channels off the air and nearly led to the total destruction of its systems. Quick action by a technician who identified and

unplugged the machine from which the attack was being carried out saved the broadcaster. Its director general, Yves Bigot, later told the BBC "we were a couple of hours from having the whole station gone for good". TV5Monde was able to resume some limited operations early the next morning after experts from the French National Cyber Security Agency (ANSSI) were called in to assess the damage and take the necessary measures. Bigot set the cost of the attack at EUR nine million in 2015-2016, with additional yearly outlays of EUR three-four million required to ensure the protection of its systems

- In late December 2016, directors of Larson Studios, a Hollywood audio post-production company working for major studios, received messages from a hacking group calling itself the Dark Overlord, informing them that it had broken

into their company's servers. The group, which had taken all the company's data from its servers before wiping it, threatened to leak it online unless it was paid some USD 50 000 in bitcoins in ransom money. The stolen data consisted of dozens of titles from major studios, including 10 unreleased episodes from the latest season of the Netflix series "Orange is the new black". Fearful of the adverse reaction of its clients, Larson Studios paid the ransom, but didn't inform its clients. The same group later threatened Netflix with circulating the unreleased episodes of the series online unless it was paid a ransom. Netflix refused to pay and the series was uploaded on a peer-to-peer torrent site. The move is unlikely to have affected Netflix, which relies on subscriptions and not on an advertising-based business model. However it cost Larson Studios an "estimated six figures" on new security measures to prevent future attacks, in addition

to the USD 50 000 ransom it paid, not to mention lost productivity and the need to rebuild trust with its clients following the studio's perceived failure to safeguard their information

Forensic evidence and "plausible deniability"

The possible motives of these attacks range from inflicting financial and reputational damage, disrupting normal operations and extortion to destroying installations or testing new forms of cyber attacks to target more important assets at a later date, as is believed to have been the case in the TV5Monde attack.

Finding out who lies behind the attacks can be a lengthy process that requires extensive forensic analysis of data to yield tangible results. The modes of attack may give an indication as to the motives and the perpetrators, but the evidence often comes well after the attacks and the suspected perpetrators are likely to deny the findings.

The Larson Studios breach appears to have been the result of a random attack from hackers who "were basically just trawling around to see if they could find a computer [running an older version of Windows] that they could open", according to the company's chief engineer. The motive was obviously extortion. The same opportunistic mode of penetration is observed in cases of ransomware when unsuspecting employees open a malware-infected file.

Investigation into the Sony Pictures attack indicates that the hackers had penetrated the company's network – which had been breached dozens of times in previous years – some weeks, or even months, before the malware was activated. US official sources attributed the attack to hackers linked to the North Korean government, a claim denied by the latter. There was no demand for a ransom, but the attack resulted in major disruption and significant financial losses.

The TV5Monde attack is particularly interesting and important as it targeted a broadcaster. Broadcasting installations are now considered to be integral parts of the critical infrastructure in countries including the US, UK, France, Germany and the Netherlands. According to ANSSI, which gave details of its findings some two years after the TV5Monde attack, it was carefully prepared and was initiated nearly three months before its effects became obvious. In late January 2015, attackers penetrated the broadcaster's IT network, mapping its infrastructure and analyzing its vulnerabilities before launching their attack on 8 April. They even went as far as leaving traces of known malware in the system to mislead investigators. TV5Monde Director General Bigot told the BBC that the investigators were able to prove only two things. Firstly, that the attack



In 2014 hackers broke into the computer systems of Sony Pictures entertainment and leaked confidential data (Photo: Coolcaesar at the English language Wikipedia)



--Warning--

We've already warned you, and this is just a beginning.

We continue till our request be met.

We've obtained all your internal data including your secrets and top secrets.

If you don't obey us, we'll release data shown below to the world.

Determine what will you do till November the 24th, 11:00 PM(GMT).

Post an email address and the following sentence on your twitter and facebook, and we'll contact the email address.

Thanks a lot to Godi's Apstls contributing your great effort to peace of the world.

Screen capture of the 'Guardians of Peace' claim of cyber attack on Sony Pictures Studios

was designed to destroy the channel, and secondly, that it was linked to a group called APT28, also known as Fancy Bear, one that is reportedly linked to Russia's military intelligence service, the GRU. Bigot said that the investigation would be unable to answer two questions: "Why TV5Monde?" and "Who gave the order and the money to that Russian group of hackers to actually do it?"

Broadcasters and media companies take action

Broadcasters and multimedia companies are now working together to confront an existential threat and critical disruptions to their business models. They rely on well-established IEC and ISO/IEC JTC 1 Standards and on recommendations and guidelines developed by broadcasting and multimedia companies and trade bodies. These companies work closely with national security agencies and IT security solution providers. They have set up a number of collaborative bodies and structures and have

developed tools to face threats.

The European Broadcasting Union (EBU), an alliance of public service media organizations, which has 73 members in 56 countries in Europe and the Middle East, and 33 associate members in Africa, Asia and the Americas, has established a Strategic Programme on Media Cyber Security (MCS). As of 1 January 2018, the EBU had published six cyber security-related 'Recommendations' covering a wide range of domains that include best practices and minimum cyber security requirements for media companies, broadcast systems, software and services, as well as cloud security or mitigation of ransomware and malware. These recommendations refer to a number of ISO/IEC Standards for IT security techniques, such as ISO/IEC 27017:2015 or ISO/IEC 27018:2014.

The EBU also organizes workshops, seminars and webinars that bring together its members, vendors and

service providers to address cyber security issues.

The Digital Production Partnership (DPP), a media industry business initiative founded by UK public service broadcasters: BBC, Channel 4 and ITV, brings together broadcasters, production companies, distributors and trade associations. The DPP, which has formed a partnership with the North American Broadcasters Association (NABA), has set up a Committed to Security Programme, which, it believes, "will help reduce the likelihood of content loss or theft". The DPP awards a 'Committed to Security Mark' to companies that meet a number of standards listed in its broadcast and production checklists, which include ISO/IEC 27001:2013.

One of the DPP members, the Association for International Broadcasting (AIB), the only global alliance of media companies that deliver, or support the delivery of, cross-border and multi-platform international broadcasting, set up a Cyber Security Working Group to help share information and expertise about existing cyber threats to media companies.

A multi-stakeholder effort

Protecting broadcast and multimedia assets and content is a task that calls for collaboration between a multitude of stakeholders to develop standards and best practices. They also share warnings regarding threats and exchange advice and solutions for deterring and detecting cyber threats as well as defending against them, mitigating their impact and recovering from them in cases when defences have been breached. Implementing the relevant IEC and ISO/IEC JTC 1 Standards is essential if these objectives are to be achieved.

AI is listening to you

Recent advances in voice recognition bring AI technologies to the home

By Natalie Mouyal

Artificial intelligence (AI) was one of the big buzzwords at CES 2018. From home appliances to robots and self-driving cars, AI is able to help us with our everyday activities. While an interest in intelligent machines can be traced back to Greek mythology, recent advances in computing that enable us to collect large quantities of data and then process it using algorithms, have hastened the development of AI technologies.

AI technologies rely on IEC Standards

The term artificial intelligence is generally understood to refer to a machine that can replicate cognitive functions such as learning and problem-solving. It is a broad concept that encapsulates ideas ranging from Frankenstein-like robots to voice assistants for smart phones and other devices.

The Joint Technical Committee of IEC and ISO on information technology (ISO/IEC JTC 1) and several of its subcommittees (SCs) prepare International Standards which contribute towards ongoing



AI enables voice recognition in cars

developments in AI. Given the rapid developments in AI across many industries, a new SC on artificial intelligence, ISO/IEC JTC 1/SC 42, was set up in 2017 with the mandate of providing standardization in the area of AI as well as guidance to other committees developing AI applications.

AI depends on the gathering, analysis and sharing of great volumes of data which are exchanged between applications as well as with external service providers. This makes it equally possible for an assistant-enabled device to turn on the oven or for a manufacturer to improve the safety features on its cars.

ISO/IEC JTC 1/SC 41 develops International Standards for the internet of things (IoT), making connectivity possible, while ISO/IEC JTC 1/SC 38 addresses the standardization of cloud computing for the storage and retrieval of data.

In addition, AI technologies rely upon IEC Standards for hardware components such as touchscreens (IEC TC 110) and audio, video and multimedia systems and equipment (IEC TC 100).

The latest AI technologies at CES

At CES this year, assistant-enabled devices using voice recognition were ubiquitous. Improved voice recognition functionality and integration into home appliances means you can now ask your refrigerator to pull up recipes and order groceries online or your television set to change channels.

Increasingly, car manufacturers are incorporating voice recognition into their models. Voice commands can be given to modify the interior temperature or play a certain song. In one model, the car adapts to passenger preferences by, for example, suggesting directions to a favourite restaurant at dinner time. These applications rely upon the work of ISO/IEC JTC 1/SC 37, which develops International Standards for generic biometric technologies including voice recognition. In addition, Technical Area (TA) 16 of TC 100 (IEC TC 100/TA 16) addresses the issue of voice recognition within the context of active assisted living (AAL).

CES was also showcasing the latest AI technology being used to help self-driving cars understand their environment and react accordingly. Smart sensors are an essential



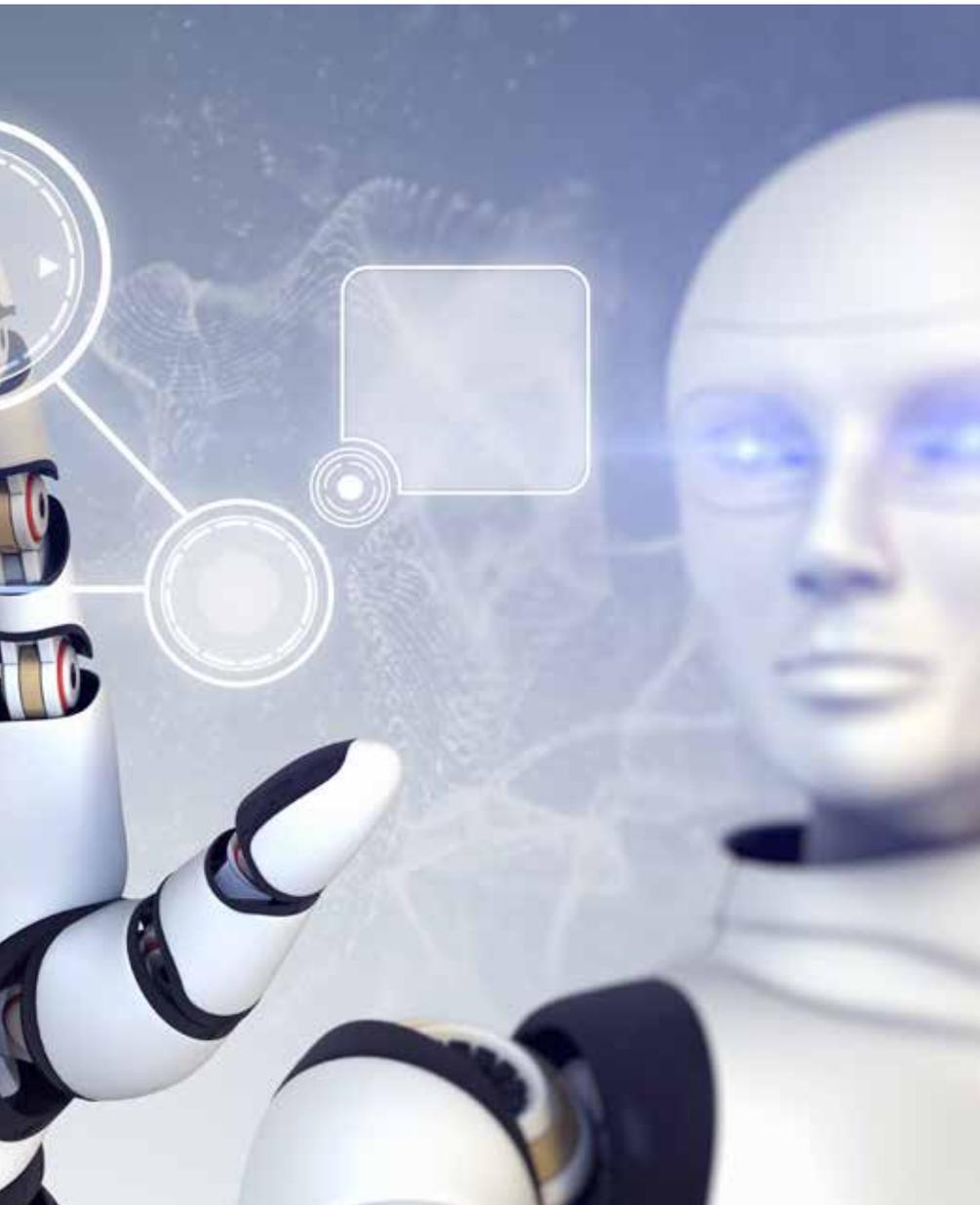
Recent advances in computing have hastened the development of AI technologies

component, allowing for the collection of the data required for vehicles to adjust their driving based on factors such as their location, the driving conditions or vehicles nearby. Other smart sensor features, such as lane-keeping, blind-spot monitoring and automatic braking systems, are already in use.

These technologies are aided by the work of IEC TC 47, which develops International Standards for the design and use of semiconductor devices, including sensors.

IEC SC 47F specifically addresses microelectromechanical systems (MEMS) which are used for automotive applications, while IEC SC 47E provides International Standards for sensors used for imaging, motion and distance detection.

Other technologies used by autonomous cars are also addressed through the work of the IEC. TCs standardize on technologies such as dashboard touchscreens (IEC TC 110), cloud computing (ISO/IEC JTC 1/SC 38) for processing,



gateways that can potentially be used to breach a system, whether at home or in a factory or car. Cyber attacks can have disastrous consequences, causing production in a factory to shut down or a home to be robbed.

Data protection is becoming increasingly important as connected devices collect vast amounts of information about their users on a daily basis. Within a home, these devices can store details such as favourite songs and television shows, but also the times of day when the home is empty. This raises considerable concerns regarding privacy that will need to be resolved.

International Standards are essential tools in the battle to provide information security and protect data against a cyber attack. ISO/IEC JTC 1/SC 27: IT security techniques, has developed the ISO/IEC 27000 family of International Standards for information security management systems (ISMS) to enable organizations to keep their data assets secure. In addition, the IEC has developed industry-specific Standards to help secure critical data. For example, IEC TC 62 provides Standards concerning the electrical equipment, electrical systems and software used in healthcare.

More industries are using AI

According to YouTube Chief Product Officer, Neal Mohan, AI accounts for 70% of the content viewed on the platform. Machine learning algorithms enable huge amounts of data to be processed and interpreted to provide patterns on which to base a prediction. As a result, YouTube can make recommendations based on our previous selections. The same approach is employed by shopping

analyzing and storing data, and near field communications (ISO/IEC JTC 1/SC 6). Work within IEC TC 100/TA 17 covers the areas of multimedia systems and equipment for cars and recently resulted in the release of Technical Standard IEC TS 63033, which enables drivers to spot obstacles using an intelligent wrap-around view monitor.

The market for AI technologies used in cars is on course for rapid growth. According to analysts at the research company IHS, unit shipments of AI

systems are expected to rise from seven million units in 2015 to 122 million by 2025.

Keeping AI safe and secure

While the introduction of new AI technologies has generated much excitement, it also raises concerns over security and the protection of data.

The ubiquity of connected devices that are able to communicate with each other increases the number of



AI can even help fold your laundry (Photo: Landroid)

sites as well as video and music streaming platforms like Netflix and Spotify.

Deep learning is the most recent AI technique to find real world applications. It mirrors the neural networks of the human brain to create transistor connections that can be strengthened or weakened depending on whether the data is interpreted correctly. As new data is received, the machine is trained automatically to perfect its predictions. As a result, machines are now able to recognize and respond to images and voices but can also beat human competitors in games such as Go and chess.

Algorithms are used extensively in the finance industry where it is estimated that high frequency AI trades account for more than half of equity share transactions on the US market. AI technology is also used to help detect fraud and communicate with customers via chatbots.

In the manufacturing sector, AI technology provides data intelligence and automation. Processes are automated to increase efficiency while data analytics and predictive algorithms enhance operations and strategy. Even cyber security benefits from AI technology in helping detect and defend against attacks.

Applications in the medical field using AI technology can detect anomalies in images and undertake semi-automatic tasks during minimally-invasive surgery. In the future, AI technology will mine through data to determine a patient’s risk for certain diseases or provide an initial diagnosis. AI will also enable the development of individualized therapy based on the genetic profile of the patient.

Voice-recognition assistants, relatively commonplace in smartphones, are increasingly found in homes as a hub through which to connect and control household appliances, order products online and stream music. Other examples include thermostats that regulate the temperature depending on whether anyone is home and security cameras that use facial recognition to decide whether to unlock the front door. These technologies rely on IEC Standards for sensors (IEC TC 47), cloud computing (ISO/IEC JTC 1/SC 38) and biometrics (ISO/IEC JTC 1/SC 37).

In the near future, cities will be using AI technology to improve safety, traffic management and infrastructure maintenance.

Looking ahead

It is not yet clear how profound an impact AI technology will have on our lives. While one Silicon Valley CEO has compared its importance to the discovery of electricity and fire, it is not clear if this is truth or hyperbole.

While we are still many years away from machines that are as smart as – or smarter than – the human mind, technical advances are progressing rapidly. The IEC continues to follow the latest advances closely and develop the relevant International Standards.

Baby tech boom

The supply of smart devices engulfs the baby tech market

By Catherine Bischofberger

Baby-related technology is increasingly about monitoring newborns from afar using the latest facial recognition tools and artificial intelligence software.

We live in an age where parents are arguably more informed than ever before. Thanks to the internet of things (IoT), a whole new industry sector has emerged over the last few years, helping anxious parents monitor their babies, be it their health, their sleeping patterns or their learning skills, using sensors, apps, cameras and even voice and facial recognition techniques. Another trend is the move of medical technology into the mainstream: wearable patches, germ-killing techniques and other medical breakthroughs are being integrated into consumer goods designed for worried mums and dads.

Baby tech has become something of a CES fixture. The show is devoting increasing space to gadgets created to support parents during their child's infancy. For the last three years, it has given awards for some of the best baby-related consumer electronics and smart devices.



Anxious parents increasingly monitor their babies from afar using voice and facial recognition technology

Bottling it up

While most of the 15 devices to make it through to the awards final list this year were fully connected, a few broke the mould. One of them is a portable solution for sterilizing

bottles and pacifiers, an example of medical technology moving into the mainstream.

The product, which was commercialized in April 2017, uses a proprietary technique employing short



Medical technology for killing germs enables baby bottles to be sterilized

wavelength ultraviolet (UV-C) and light emitting diode (LED) technologies to kill germs. UV germicidal irradiation has been used in medical sanitation since the middle of the 20th century. At wavelengths of 260-270 nanometers (nm), UV light breaks molecular bonds in the DNA of microorganisms and bacteria, stopping them from reproducing.

Recent developments in LED technology have led to the emergence of commercially available UVC-LED devices. UVC-LED uses semiconductors to emit light between 255-280 nm. The reduced size of LEDs and their low power consumption means they can be integrated into cheap consumer goods, such as the portable sterilizer mentioned above.

IEC Technical Committee (TC) 34: Lamps and related equipment, prepares International Standards

relating to lighting solutions, with IEC Subcommittee (SC) 34A: Lamps publishing Standards relating to lamps including LEDs, OLEDs and glow starters.

IEC TC 61: Safety of household and similar electrical appliances, publishes International Standards which, among many others, deal with the safety of UV radiation water treatment appliances. The TC also prepares Standards which deal with the safety of electric toys intended for children under 14 years of age and with at least one function dependent on electricity. In 2017 the TC issued a new edition of IEC 62115, *Electric toys-safety*. Standards concerning the design, manufacture, use and reuse of discrete semiconductor devices are produced under the remit of IEC TC 47: Semiconductor devices.

IECQ, the IEC Quality Assessment System for Electronic Components, is

a worldwide approval and certification system that covers the supply, assembly, associated materials and processes of a large variety of electronic components that are used in millions of devices and systems. The IECQ Scheme for LED Lighting gives consumers the assurance that suppliers who are covered by the scheme manufacture products which meet the appropriate standards of reliability, safety and cost-efficiency.

Does your face fit?

Most of the other devices selected for the finals of the awards involve an app and some form of monitoring. One of the products to stand out is a baby monitor that can recognize human faces and detect pets. The trend for baby monitors to incorporate facial recognition is growing. According to companies producing such devices, they enable parents to identify unwanted people around the baby

while they are away (the nanny's boyfriend for instance) without having to watch non-stop live video.

Voice recognition and artificial intelligence are features of another interesting baby monitor to make the CES finals. Designed by a neuroscientist, it uses voice recognition and artificial intelligence software to measure the richness of the child's language environment and recommend tips and ideas to help parents connect with the child in a way that maximizes his or her development.

"We have developed our own natural language processing proprietary algorithms because it gives us better control of the data analysis. It enables us to specifically quantify critical measures of a child's learning environments", says a business manager for the company.

According to baby care specialist Klaus Neefisher, at consumer market

research consultancy GfK, "demand for camera-based monitoring devices is increasing across most of the markets we survey. However we also detect a level of distrust towards smart connected baby tech gadgets, for instance in Germany where sales of smart monitors remain low compared to several other European countries. According to our research, it is because the quality of the internet connection is not always good enough and quite a few people have been put off from buying the devices."

International Standards relating to digital camera specifications are published by IEC TC 100: Audio, video and multimedia systems and equipment. IEC TC 110: Electronic display services, issues Standards relating to TVs, tablets, mobiles and other displays.

ISO/IEC JTC 1, the Joint Technical Committee formed by the IEC and ISO on information technology, has established SC 37: Biometrics, which

develops Standards for generic biometric technologies, including facial recognition.

JTC 1 has also created SC 41: Internet of things and related technologies, which publishes Standards on sensor networks, among other things.

Different IEC TCs deal with varied aspects of voice recognition. TC 100 has set up Technical Area (TA) 16: Active Assisted Living (AAL), accessibility and user interface, which covers voice recognition.

JTC 1/SC 35: User interfaces, publishes International Standards pertaining to voice recognition. One of them is ISO/IEC 30122-1 which deals with the framework of and general guidance for voice command user interfaces.

Protecting data

Sales of connected baby tech devices could suffer from increasingly widespread concerns over the issue of privacy, notably in the US. How can children's data be protected from potential hackers? Is the encryption software included in the various devices adequate for safeguarding information relating to people's babies?

Cyber security and data protection are both major focuses of IEC work. It has published more than 200 International Standards dealing with these issues.

In addition, the IEC Conformity Assessment Board (CAB) set up Working Group (WG) 17, to investigate the need for and timeframe of global certification schemes for products, services, personnel and integrated systems in the area of cyber security.



Concerns are widespread about the protection of baby-related data

Living in a smart world

Standardization helps achieve an effective, safe, reliable IoT, while enabling the creation of a global market

By Antoinette Price

Whether we realize it or not, the internet of things (IoT) is part of many aspects of daily life. Thanks to billions of connected, 'sensorized' devices and systems, it can facilitate everyday activities and tasks and improve the efficiency of work processes, which saves time and money. In the case of healthcare, it can save lives and improve quality of life.

Connected everywhere

Cities and their infrastructures including transport, energy, buildings and homes are becoming smart, in order to boost energy efficiency and enhance how they function. The well-being of citizens and the economy both benefit from this.

Intelligent collaborative manufacturing systems enable businesses to respond in real time, to meet changing demands and conditions in factories, supply networks and customer needs, while on the rural front, farmers can streamline crop and animal management, using smart phones and apps.

IoT is also changing how other industries work, such as automotive, healthcare, entertainment and retail.

In all these areas, this technology contributes toward building a more sustainable world.

The need for standards

The IoT is comprised of diverse and evolving technologies and stakeholders involved in a wide range of applications. For this reason, it is paramount to provide a minimum level of interoperability. This would allow all the components to function rapidly and reliably, as they gather, exchange and analyze vast amounts of data. IoT Standards will also facilitate the growth of IoT devices, systems and services market.

The IEC and ISO Joint Technical Committee ISO/IEC JTC 1 develops International Standards for information and communication technologies for business and consumer applications.

Given the great importance and impact of IoT, in 2016, JTC 1

established a new Subcommittee ISO/IEC JTC 1/SC 41: Internet of things and related technologies, which has consolidated and expanded the activities of former Working Groups (WGs) 7 and 10. The main focus of SC 41 is to establish a standardization programme, and provide guidance to JTC 1, IEC, ISO and other entities developing IoT-related applications. Its scope also covers sensor networks and wearables technologies.

In addition to the Standards already published for sensor networks, SC 41 is developing base or horizontal Standards for IoT reference





Medical wearables collect and exchange users' health data (Photo: techcrunch.com)

architecture, vocabulary, and interoperability. These can be used by industry and any application-related standardization technical committee, where IoT technology is used as an enabler. By ensuring consistency and avoiding duplication, businesses and manufacturers can save time, effort and money.

A year of achievements for SC 41

e-tech caught up with François Coallier, Chair of SC 41, to hear what has been achieved during the first year, and what's in store for 2018. A great deal of the activity has been

administrative, setting up the work structure, governance and strategic planning. All of this was done in parallel with the continuation of the technical work inherited from the former WGs, which totals 11 projects.

"We created six study groups (SGs) at the first plenary: edge computing, industrial IoT, real-time IoT, trustworthiness, wearables and IoT use cases. All groups are progressing. The edge computing group was mandated to help enable the recommendations of the Edge intelligence White Paper. Based on the recommendations of this SG, SC 41

initiated a project in this area at its last plenary meeting in New Delhi, India."

The importance of building synergies

Many players are involved in developing the component devices and systems that make up the ubiquitous IoT, as well as their related Standards. An important part of SC 41 activities will be to liaise, with other IEC technical committees (TCs) and subcommittees (SCs), as well as with other standards development organizations (SDOs) and groups within the industry. SC 41 already liaises with ISO and ITU-T, and the Advancing Identification Matters (AIM), Industrial Internet Consortium (IIC), Open Connectivity Foundation (OCF), Open Geospatial Consortium (OGC), Global Language of Business (GS1), and the International Council on Systems Engineering (INCOSE).

"We have to be systematic and work with a lot of different people, so this will be a big challenge as there are around 24 IEC TCs and SCs. For example, our edge computing work will liaise with ISO/IEC JTC 1/SC 38 for cloud computing and our trustworthiness study group will work with ISO/IEC JTC 1/SC 27 on IT security techniques, while our wearables study group will be in regular contact with IEC TC 124 which covers wearables and their technologies. Then there are our Systems Committees, for active assisted living (SyC AAL), smart cities (SyC Smart cities) and the newly established SyC Smart manufacturing. This year we also hope to expand our external liaisons", said Coallier.

A busy year ahead

Countless applications use IoT technology. From entertainment, communicating and purchasing



François Coallier, Chair, ISO/IEC JTC 1/SC 41: IoT and related technologies

goods and services, to running appliances and systems (security, heating and lighting) in homes and cars (GPS location, weather, traffic, entertainment, etc.), SC 41 has a busy and varied workload, as Coallier comments below.

Industrial IoT

Industrial IoT (IIoT) essentially refers to all IoT application domains excluding the home market. This includes advanced manufacturing, healthcare, precision agriculture, smart grids and energy management, etc.

“There’s plenty to do and it’s important that our Standards cover the needs of these application domains properly.”

Real time IoT

Many IoT systems must be able to react to events in real time. This is an attribute of a class of systems called cyber-physical systems (CPS), which are key to applications such as advanced manufacturing and smart grids.

“Work in this area is essential, for instance, the National Institute of Standards and Technology (NIST) has already published documents in this area, and I’m looking forward to the recommendations of this study group.”

Trustworthiness

Whether the grid, a home, a medical wearable or vehicle infotainment, connected devices and systems must be protected from cyber threats, to ensure the safety of users and security of private data, and be safe, responsive, reliable, available and resilient. IoT trustworthiness is a systems engineering concept that covers all the attributes involved in having stakeholders ‘trust’ an IoT system.

“This is a very key topic for IoT and this study group will work with other IEC subcommittees including IT security.”

Wearables

Wearables refers to a class of IoT devices that are worn on or implanted in the body. While there are many applications for wearables, one of them is healthcare.

“Just like in a factory, where one of the advanced manufacturing features that people are looking for is predictive maintenance for all the factory equipment, you can apply predictive maintenance to the human body. You do this by processing all the data collected by sensors in or on the body, and try to predict conditions and events as you look at how the body reacts when you walk or do fitness. Then you use this to detect patterns and a condition that may be slowly developing. There are many possibilities in this area and there will be a number of work projects for the wearables group.”



Increased connectivity between technologies, processes and people enables smart manufacturing (Photo: roboticsbusinessreview.com)

Achieving harmonization

Recognition for the work done by IEC TC 40 experts around the world

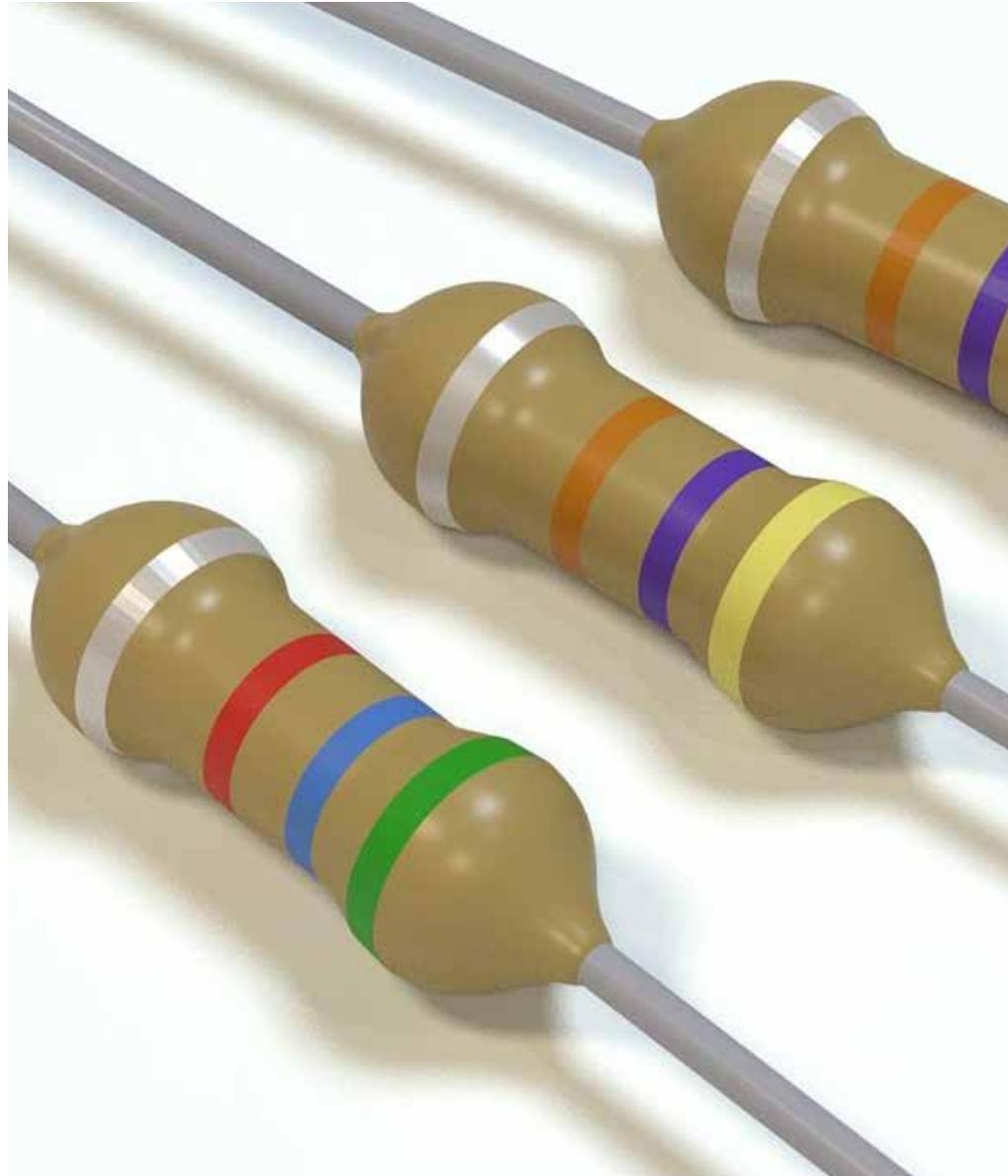
By Claire Marchand

Capacitors, resistors and inductors are passive components. Together with active components (semiconductors), circuit boards, connectors and some other components such as filters, switches and fuses, they represent the basic building blocks of myriads of electronic products across the world.

A huge market

The use of ever smaller, high-performance electronic devices and equipment in all fields of industry as well as in residential and commercial applications, the advent of the internet of things (IoT) and a smarter global environment have boosted the demand for passive components. More than 4 000 billion discrete resistors, capacitors and inductors are used annually. The market is fully global and its value exceeds EUR 25 billion (2015).

In the 21st century, five major technological trends have been influencing the development of all components and will continue to do so: miniaturization, automatic assembly, electronics assembly



Resistors are electrical components that limit or regulate the flow of electrical current in an electronic circuit and can also be used to provide a specific voltage for active devices such as transistors (Photo: chrvoje engineering - YouTube)

technology – surface mounting is now increasingly giving way to component embedding – digitization of electronics and a requirement for zero defects.

Facing challenges

These trends have meant huge technological challenges when developing passive components. At

the same time, passive component prices have fallen, leading to important mergers and acquisitions in the sector and reducing drastically the number of players involved. Production has moved to low-cost countries and the primary users of passive components – the consumer goods industry – have for a large part left Europe, Japan and North America for the Asia-Pacific

region. In 2000, Europe, Japan and North America produced about 55% of all capacitors; in 2015, their share of production was 20%.

Keeping abreast of technological advances

Technological advances have also had a major influence on standardization in this field. New standards have emerged for new component families and there have been updates of existing specifications, test methods and requirements in order to address the trends outlined above.

IEC Technical Committee (TC) 40: Capacitors and resistors for electronic equipment, created in the mid-50s to tackle standardization in the emerging electronics sector, has had to face these challenges head on and adapt to the ever increasing pace of technological developments in the past 20 years or so.

Harmonization: the first steps

Some 20 years ago, TC 40 experts noticed that the IEC International Standards it developed were being adopted by Japan as national standards. That gave the experts the idea of following closely how their Standards were harmonized and adopted at regional and national levels.

They focused on three geographical areas: Europe, Japan and the US. Representatives from each area were asked to give a progress report on adoptions at each subsequent plenary meeting of the TC.

In Europe

Originally the link between IEC International Standards and European ones was a *de facto* harmonization of the technical

contents of standards due to the fact that the same experts were working on both developments. The Dresden Agreement between the IEC and the European Committee for Electrotechnical Standardization (CENELEC), originally approved in 1991 and amended in 1996, aimed to avoid duplication of efforts and reduce development time when preparing standards, made monitoring of true harmonization straightforward. A revision of the partnership in 2016 led to the signing of the Frankfurt Agreement.

New standards projects are planned jointly by IEC and CENELEC and, whenever possible, are carried out at the international level. Both organizations vote in parallel during the standards development process. If the outcome of the parallel voting is positive, the IEC publishes the International Standard and CENELEC



Miniature aluminium electrolytic capacitors used in industrial automation, automotive, power management, audio and white goods (Photo: Panasonic)

ratifies the European standard.

As far as TC 40 is concerned, the vast majority of European standards are harmonized with the corresponding IEC International Standards.

In Japan

In 1995, the Ministry of International Trade and Industry (MITI), reorganized in 2001 into the Ministry of Economy, Trade and Industry (METI), made the decision that all IEC International Standards – including those developed by TC 40 – should be translated into Japanese and adopted as Japanese Industrial Standards (JIS). The decision aligned with the World Trade Organization (WTO) Technical Barriers to Trade (TBT) Agreement that came into force in January 1995. Today, Japan is very close to equating to the European level of harmonization. Generally speaking, all active Standards developed by TC 40 have been adopted as national ones. While the numbering system Japan uses is different from the IEC numbering system, the content is identical. Japan also participates in IEC work when a new edition is underway, and, once it is published, the Japanese standard is revised accordingly.

Japan has put in place a complex mechanism, involving several governmental agencies, for tackling the huge task of selecting, translating and approving the publications to be harmonized. They include, among others, the Japan Electronics and Information Technology Industries Association (JEITA), the Japanese Industrial Standards Committee (JISC) and the Japanese Standards Association (JSA). All come together under the METI umbrella.

Since 1995, Japan's involvement in TC 40 has grown tremendously and

the number of Japanese experts participating in the committee's work has increased. At national level, the TC 40 mirror committee is extremely active in the harmonization process and several committees have been established, addressing specific technologies – passive components, packaging and so forth. At the beginning their task was to follow the development of a new IEC Standard until publication and then to translate it into Japanese for final approval by METI before adoption. Over time, the committees started to make proposals for new IEC Standards, for amendments and revisions of existing IEC Standards or for the adoption at IEC level of existing JEITA and JIS standards. Today Japan has more convenorships of Working Groups (WGs), Project Teams (PTs) and Maintenance Teams (MTs) in TC 40 than any other country.

The United States

EIA standards

The situation in the US is somewhat different. The country has a large number of bodies developing standards but in the capacitor/resistor field, TC 40 works with two organizations.

One is the Electronic Components Industry Association (ECIA) which continues the work previously undertaken by the Electronic Industries Alliance (EIA), a standards and trade organization for US electronic manufacturers which ceased its operations in 2011. At the time, EIA had designated the Electronic Components Association (ECA) to continue to develop standards for interconnect, passive and electromechanical (IP&E) electronic components under the American National Standards Institute

(ANSI)-designation of EIA standards. However, the same year, ECA merged with the National Electronic Distributors Association (NEDA) to form the Electronic Components Industry Association (ECIA).

Some years ago, ECIA started to harmonize the EIA capacitor standards with those of the IEC. The 2008 edition of IEC 60384-1, *Fixed capacitors for use in electronic equipment - Part 1: Generic specification*, was the first publication to be considered. Today, the harmonization process for the 2016 edition of the Standard is underway and most of the TC 40 International Standards have been adopted as EIA standards.

UL

The other partnership, with Underwriters Laboratories (UL), focuses on safety aspects. The first IEC International Standard harmonized was published in 2013: IEC 60384-14, *Fixed capacitors for use in electronic equipment - Part 14: Sectional specification - Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*.

The safety issue is of the utmost importance. Risks associated with defective capacitors include fires or electric shocks.

TC 40 has been working with UL to find common grounds for the harmonization of Standards that cover filter units for the suppression of electromagnetic interference. UL filter standards are much more complex than IEC Standards due to the greater number of filters involved. The objective has been to reach a compromise that accommodates all important safety aspects on both sides. The first commonly agreed

Standard in this area, covering appliance filters, is IEC 60939-3:2015, *Passive filter units for electromagnetic interference suppression - Part 3: Passive filter units for which safety tests are appropriate.*

As a rule, UL doesn't formally adopt IEC Standards but common work between TC 40 and UL ensures that, ultimately, they possess the same specifications and requirements.

Huge amounts of money are involved in the certification of electromagnetic interference (EMI) filters. Companies can save significantly if they have only one standard to comply with, rather than several.

Harmonization status in Europe, Japan and the US

At the end of November 2017, TC 40 reported that the majority of its International Standards had been harmonized in Europe, Japan and the United States. They include most of the publications in the IEC 60384 series on fixed capacitors for use in electronic equipment, four Standards in the IEC 60115 series on fixed resistors for use in electronic equipment, four in the IEC 60938 series on fixed inductors for electromagnetic interference suppression and three in the IEC 62391 series on fixed electrical double-layer capacitors for use in electronic equipment.

Resistors resist change...

Nevertheless some IEC Standards developed by TC 40 have not been harmonized in Europe or elsewhere. They are predominantly old publications covering resistors that have not been modified or updated but are still in use, mainly in the defense sector.



Tantalum capacitors (Photo: Mataresephotos/Wikimedia Commons)

Why have these publications not been updated? It has become increasingly difficult to find industry experts. Important changes have taken place in the capacitor and resistor industry sector. While in the 1980s Europe had the lead in manufacturing these components, interest in the technology started to wane in the following decade; many European companies disappeared or merged with others, which were often larger, until very few were left. Experts who previously had been working for different companies ended up working for the same group. As a result, companies sent fewer experts to TC 40. Over the years, the diminishing number of experts has slowed down and delayed work considerably in that field. This

accounts for the old standards never having been revised.

...up to a point

Today, a high proportion of all capacitors and resistors come from China and the workforce there has become extremely knowledgeable about the technology. In 2013, Chinese experts participating in the TC 40 plenary meeting in New Delhi, India, came up with a proposal to develop new testing methods for certain variable resistors, one of the areas in which the TC had had problems finding experts in the past. This will enable maintenance of older Standards to be undertaken. Having China as the lead may incite experts from other regions to join in this effort.

UNECE holds 4th Session Group of Experts on Renewable Energy

Getting more renewables into the global energy mix

By Antoinette Price

According to the International Energy Agency's (IEA) Renewables Market Report series for 2017, renewables accounted for almost two-thirds of net new power capacity around the world in 2016, thanks to a strong solar PV market. The Report forecasts that though coal will still be the largest source of electricity generation, renewables are expected to halve the gap down to 17% by 2022.

Many countries around the world are working towards producing more power from and increasing the amount of renewables to be integrated into national energy supplies.

The United Nations Economic Commission for Europe (UNECE) met in November for its fourth session of the Group of Experts

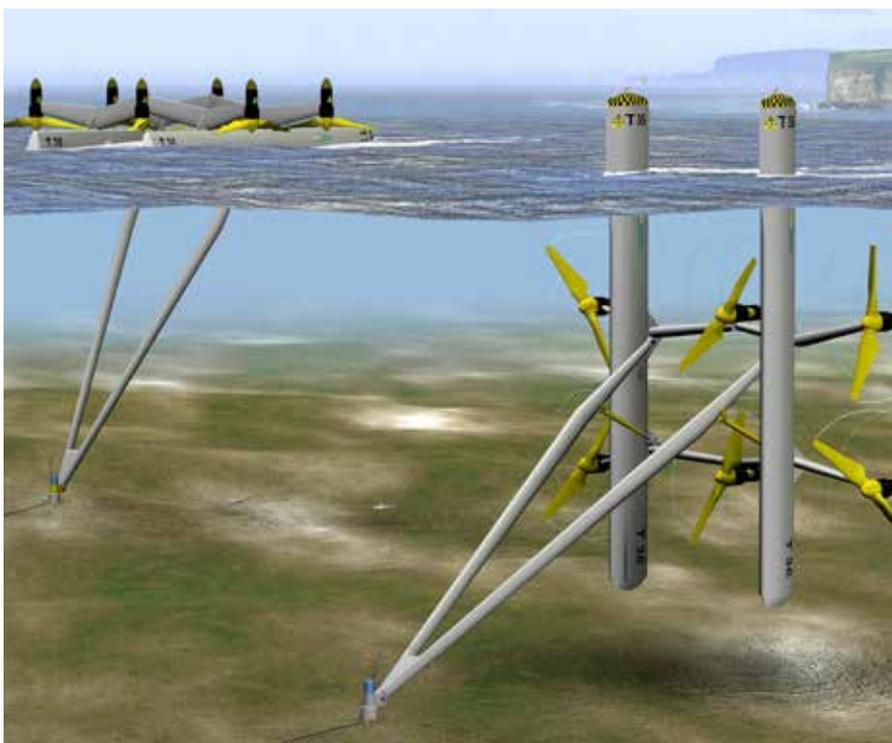
on Renewable Energy Efficiency (GERE). Attending the event were ministers, companies developing RE equipment and systems, and international organizations, such as the International Renewable Energy Agency (IRENA) and the International Energy Agency (IEA).

How standards and certification promote renewables

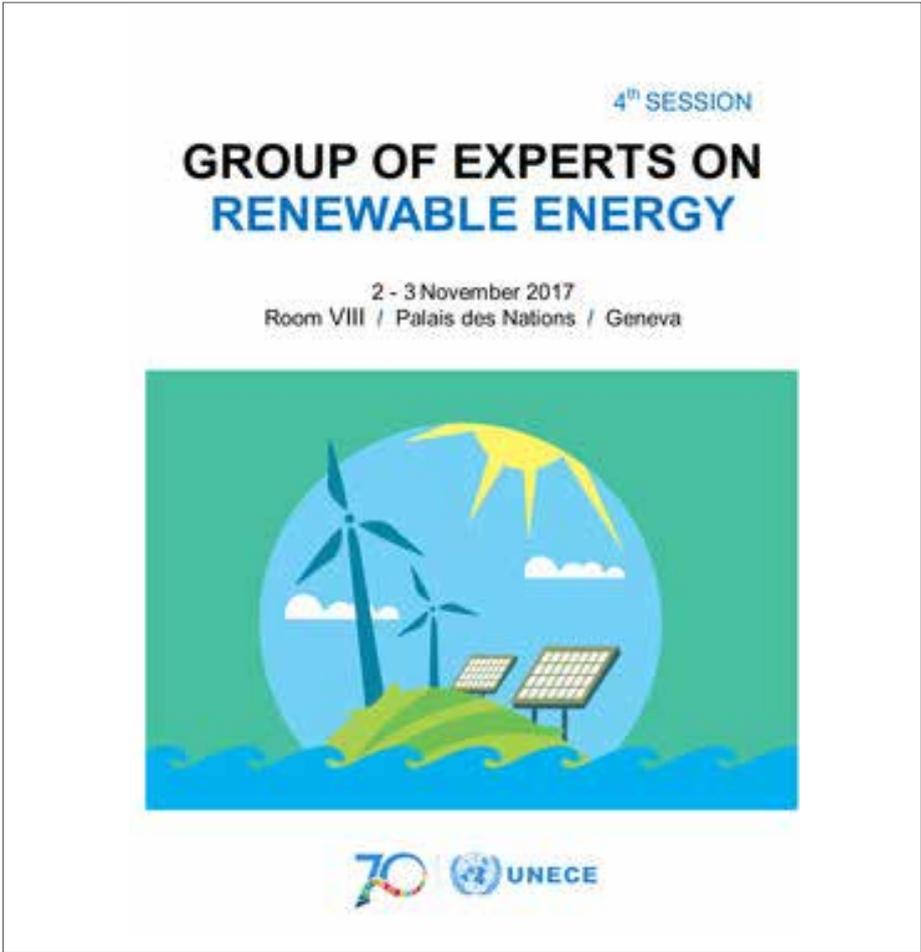
The aim of the meeting was to look at progress on implementing activities under the current two-year plan and those for the 2018-2019 period. Four themes discussed were:

- Tracking progress of renewable energy (RE) development (based on the key findings in the REN21 UNECE Renewable Energy Status Report 2017)
- Best practices on how to increase RE uptake
- Integration of RE in future sustainable energy systems and cross-cutting collaboration
- Promotion of RE investments

Jonathan Colby, Chair, Marine Energy, Operational Management Committee for IECRE, the IEC System



Marine energy comes from waves, currents, tides and heat they collect from the sun
(Photo: TidalStream)



The event brought together RE experts from different sectors

for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications, presented during the event.

He highlighted the importance of third party certification to consensus-based International Standards, which can reduce risk, improve market access and support the commercialization of marine energy.

Colby is also Chair of IEC Technical Committee (TC) 114: Marine energy, which develops Standards that cover design and safety, including reliability and survivability; performance measurements of wave, tidal and water current energy converters; testing: laboratory, manufacturing and factory acceptance, measurement methodologies of physical aspects of the device and more. These Standards

are used for certification within IECRE Marine energy sector.

IECRE helps drive marine energy development

“The most important outcome of the GERE meeting was to have three conclusions included in the GERE Meeting Report, which is great for marine energy and for the work we do on Standards and certifications”, said Colby.

Conclusions reached:

- “Requests the Secretariat to explore how to promote dissemination and education of the value of consensus-based International Standards and certification systems for accelerating the uptake of renewable energy technologies,

depending on availability of funding and in cooperation with key players.”

- “Invite the Expert Group on Resource Classification to extend the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources (UNFC) Task Force to include marine energy resources in close cooperation with the Group of Experts.”
- “Recommended to prepare an ECE Renewable Energy Report for the entire ECE region including the full spectrum of renewable energy technologies, depending on availability of funding.”

More about IECRE

IECRE was created in 2014, because the ever-increasing demand for electricity, and the need to reduce power generated by fossil fuels have led to rapid development and growth of the RE sector. IECRE also addresses the specific requirements of the RE sector, which are not covered by the existing IEC Conformity Assessment Systems.

The System aims to facilitate international trade in equipment and services for use in RE in the marine, solar photovoltaic (PV) and wind energy sectors, while maintaining the required level of safety. Each of these sectors will be able to operate IECRE Schemes that cover products, services and personnel, to provide testing, inspection and certification.



IECRE Certification Scheme for RE equipment and services

Electronics inside

The world wouldn't be smart without electronic components

By Claire Marchand



Communication between cars and/or with traffic signals is expected to make roads safer (Photo: Joe Barkai blog)

What do artificial intelligence, robotics, biometrics, virtual and augmented reality, sports innovations, digital health and 5G connectivity have in common? First, they were all singled out at CES 2018, the Consumer Electronics Show in Las Vegas, as mega trends that will have an impact on society this year and in the future. Secondly, they all rely heavily on electronic components – in fact they would not even exist if not for them.

Small and indispensable

Electronic components are at the heart of the smart world we live in. Human activities – home, workplace, leisure and sports, travel and tourism, education, healthcare – increasingly depend on a smart something or other.

All this connectivity and smartness would not be possible without electronic components, sensors, in the first place. Sensors are what make devices smart, and they have become smart themselves. They form a crucial and integral part of the internet of things (IoT). The "thing" in IoT can be a person with a glucose-monitoring skin wearable, a car that can detect blind spots or alert the driver when tire pressure is higher or lower than

what it should be, a farm animal with a biochip transponder that tracks all its movements, in brief any object that can be assigned an IP address and can transfer data to a network.

Quality and reliability come first

Electronic components are key elements that enable devices to connect and exchange data. Because they are used in so many different devices and systems, they have to be of high quality and reliability. A faulty component in a smart medical device or in a car electronic system can result at best in poor performance but also in injuries or fatalities.

The IECQ solution

Electronic component manufacturers and suppliers all over the world have

a powerful tool at their disposal, enabling their products to meet the strictest requirements: IECQ testing and certification. IECQ is the IEC Quality Assessment System for Electronic Components.

As the 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.

In addition, there are a multitude of related materials and processes that are covered by the IECQ Schemes. IECQ certificates are used worldwide as a tool to monitor and control the manufacturing supply chain, thus helping to reduce costs and time to

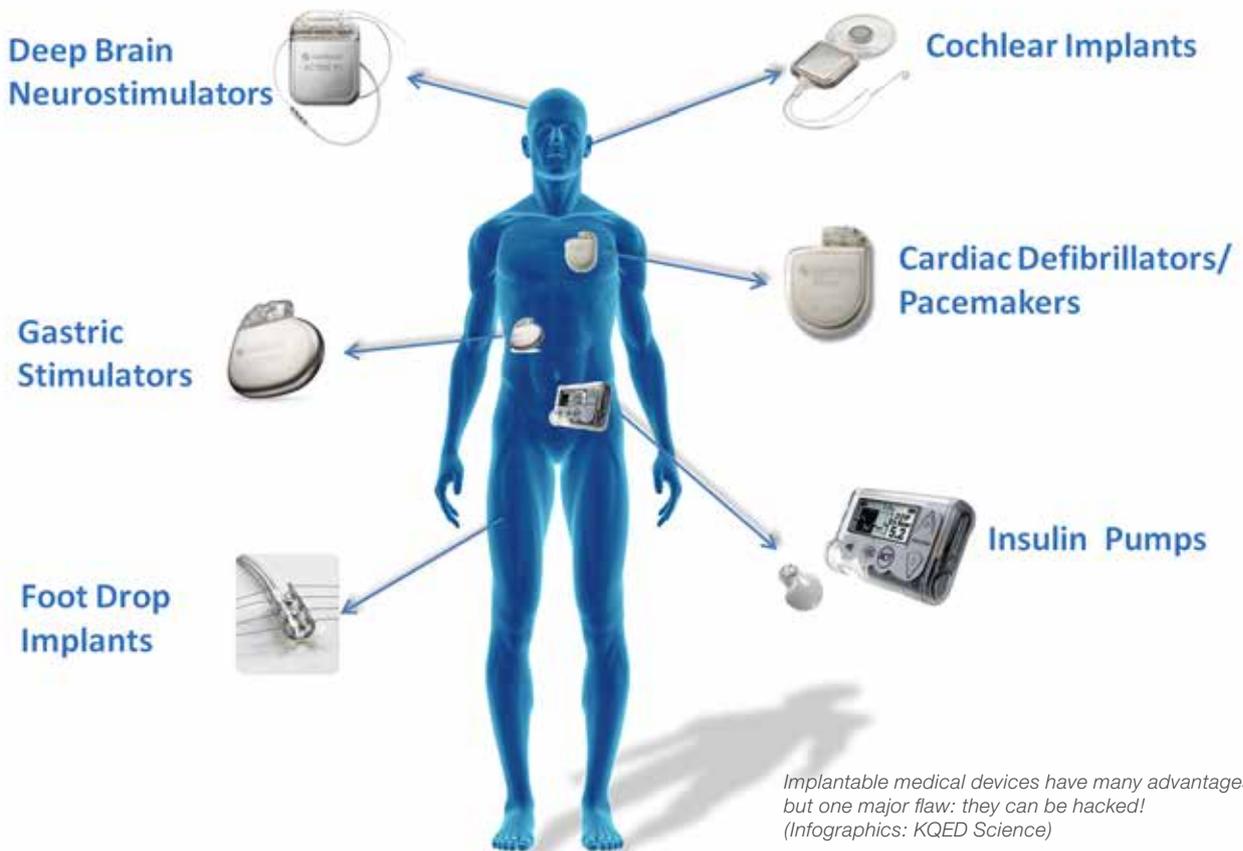
market, and eliminating the need for multiple re-assessments of suppliers.

IECQ operates industry specific Certification Schemes:

- IECQ AP (Approved Process)
 - IECQ AP-CAP (Counterfeit Avoidance Programme)
- IECQ AC (Approved Component)
 - IECQ AC-TC (Technology Certification)
 - IECQ AC-AQP (Automotive Qualification Programme)
 - IECQ Scheme for LED Lighting (LED components, assemblies and systems)
- IECQ Avionics
- IECQ HSPM (Hazardous Substances Process Management)
- IECQ ITL (Independent Testing Laboratory)

More information on IECQ: www.iecq.org

WIRELESS IMPLANTABLE MEDICAL DEVICES



Croatia to host IECEx event

Save the date for the IECEx International Conference in Split

By Claire Marchand

In just six years, the IECEx international conferences have made their mark and have become must-attend events on the annual conference circuit for the Ex industry sector. After Dubai, United Arab Emirates (UAE) in 2012, Kuala Lumpur, Malaysia, in 2014, Gdańsk, Poland, in 2015 and Shanghai, China, in 2017, the city of Split, in Croatia, will host the fifth IECEx International Conference on 23 April 2018, so make sure to save the date in your calendar!

Honorary patronage of the President of the Republic of Croatia

Jointly organized by IEC and IECEx, the IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres, together with the Croatian Standards Institute (HZN) and in conjunction with the United Nations Economic Commission for Europe (UNECE), the conference – *Safety of Equipment, Services and Personnel in Explosive Atmospheres* – is a unique opportunity for industries in the region and from around the world to become better acquainted with IECEx and find out how they can best benefit from the services the System provides, and



The certification of persons working in hazardous areas will be addressed during the event



Ex equipment manufacturing as well as repair and overhaul will be on the agenda

also to get involved and form precious contacts and networks within the Ex community of experts.

The conference is placed under the honorary patronage of the President of the Republic of Croatia Kolinda Grabar-Kitarovi and with the support of the Croatian Ministry of Economy,

Entrepreneurship and Crafts, and of Fiditas.

World experts share experience and knowledge

The conference will bring together experts from all over the world, involved in international

standardization, equipment manufacturing, inspection, repair and overhaul of Ex equipment and systems, and the assessment and certification of personnel competence. Issues concerning requirements and regulations in the 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 on all matters pertaining to the Ex field, such as plant design, principles and practical applications of area classification, installation and repair in compliance to IEC International Standards.

They will answer questions, provide advice and give valuable information to anyone involved in the Ex sector.

What is on the programme?

The day will start with an introduction to the IECEx System and its Schemes, followed by a focus on specific topics such as area classification, a practical approach to Ex installations according to the requirements of IEC International Standards in the IEC 60079 series, assembly certification for explosive dust atmospheres and an overview of some national or regional Ex verification or approval systems.

Also on the agenda are more in-depth presentations of the three IECEx Schemes:

- IECEx Certified Equipment
- IECEx Certified Service Facilities
- IECEx Certified Persons
- UNECE best practices

As part of the conference agenda, UNECE will discuss the conclusions and findings of their global study into

regulations for the Ex field, presented in the Common Regulatory Framework for Equipment used in Environments with an Explosive Atmosphere. The publication is based on and encompasses international best practice and international standards, and in particular standards from IEC Technical Committee (TC) 31: Equipment for explosive atmospheres. It also formally endorses IECEx as the recommended global best practice model for verifying conformity to international standards.

Feedback is important

A presentation on end-user feedback covering industry needs concerning day-to-day operations – in equipment procurement, installation, maintenance

and repair, and competence of people – will be followed by an open forum where attendees can raise questions concerning IECEx and various Ex issues.

Get involved, participate!

Do not miss the opportunity to listen and talk to leading experts who may give you a new take on issues pertaining to explosive atmospheres. And think twice before saying it is of no concern to you. The Ex industry is not just about oil and gas. The risk of fire or explosion exists in a variety of other sectors, such as transportation – including aerospace – furniture manufacturing, automotive manufacturing and repair, pharmaceuticals, food processing,

grain handling and storage, sugar refineries and coal mining. Register now to gain invaluable knowledge and a new perspective on safety issues in Ex environments!

Practical information

Admission to the conference is FREE of charge.

The conference will be held in Split, Croatia on 23 April 2018.

For registration and details on the event, please visit the official conference site at: www.iecex.com/meeting-and-events/iecex/.

For further information on IECEx, please go to: www.iecex.com, or send an email to: info@iecex.com



Split will host the fifth IECEx International Conference on 23 April 2018

Standards are key to the evolution of smart cities

International forum promotes cooperation of standardization organizations

By Antoinette Price



Around the world, urban populations are booming. An estimated 54.5 percent of global populations lived in urban settlements in 2016 and this number is expected to increase to 60% by 2030, according to research by the United Nations.

Putting citizens first

If cities are to provide sustainable economies and improve citizens' lives, many challenges lie ahead, such as tackling overstretched transport and health services, managing energy and ensuring accessibility and mobility for rapidly aging populations. This last point is particularly important given figures from the UN Department of Economic and Social Affairs *World Population Prospects – 2017 Revision: Ageing population*, showed that one billion people were aged over 60 in 2017, a number expected to rise to 2,1 billion by 2050.

Creating synergies

International standards provide cities with guidance, and offer solutions to specific technical, environmental,

IEC, ISO and ITU hold an annual World Smart City Forum

social and security issues, which affect services, infrastructure and the well-being of urban citizens.

There are many challenges and no single standards organization can develop all smart city standards alone. IEC, ISO and ITU established the World Smart City partnership, which holds an annual World Smart City Forum (WSCF) each year.

The Forum aims to understand and meet the identified needs of stakeholders, develop consensus-based Standards of good practice that address urban challenges, and create common markets. It is also designed to intensify cooperation and reduce duplicative standardization work for smart cities.

Organized under the leadership of ISO, the WSCF 2017 theme was *Future cities – Solutions for common challenges: How International Standards support the development of smart and sustainable cities*. City representatives, standards development organizations, industry groups and investors gathered to discuss their evolving needs with standardization organizations, and to understand how the latter can help achieve smart, efficient cities.

Building on synergies, the Forum took place at the Smart City Expo World Congress in Barcelona, Spain, which attracted over 18 000 visitors, 675 exhibitors, 420 speakers, more than 700 cities and over 120 countries.

Talking Standards

In an interview for *Cities Today* magazine, in the lead-up to the event, IEC General Secretary and CEO Frans Vreeswijk commented on the role of IEC in the development of smart cities around the world:



Data and technology allow smart cities to be more efficient, sustainable, and improve the lives of citizens (Photo: layoverguide.com)

“Cities are giant systems with countless subsystems. All of them depend on electric power and hardware to move people and things, collect data and exchange information...In total IEC has identified over 1 800 Standards and we offer a globally standardized approach to testing and certification services to ensure that vendor promises are kept.”

IEC work for smart cities covers many areas, including energy generation, public and private transport, water management, city services, healthcare, active assisted living and accessibility, technology found in smart buildings, homes and consumer electronics.

One of the challenges for cities is to increase the efficiency of operations and use of resources. The more connected key systems are, the easier it is to manage daily functioning and

handle emergency or other situations. This is no mean feat given that many of the systems and technologies come from different providers.

“IEC provides many of the International Standards that are needed to safely connect and automate much of the city infrastructure that generates or uses electricity and contains electronics. The use of International Standards also facilitates the long-term maintenance and repair of city infrastructure. Spare parts can be bought anywhere in the world at more competitive prices.”

About WSCF

Discover more about the WSC partnership, all WSCF events, the community blog and hang outs and read how IEC Standards are making smart cities reality at: www.worldsmartcity.org

Energy access: key to economic and societal development

ARE Forum focuses on integrating remote communities into economies

By Claire Marchand

Electricity access is one of the key drivers for economic development, better healthcare, increased safety, education, as well as efficiency gains in agriculture and manufacturing.

In an ideal world, everyone would be connected everywhere to efficient power grids that deliver electricity 24/7. However rural areas in many countries around the world can sometimes be so remote that connection to the main grid would be too complex and/or too expensive to install. In these circumstances, renewable energy off-grid applications provide the most suitable energy solution.

Affordable solutions

Basic, affordable and immediate technical solutions exist that can bring electricity to those populations that would otherwise have to remain without a grid connection for years.

Through its Affiliate Country Programme, the IEC has been a leading force in advocating electricity access for all, promoting the



Electronic devices can use LVDC produced by renewable sources directly, without conversion

technologies, such as solar, wind or hydro power, which can be deployed in decentralized rural electrification systems, as well as promoting the relevant IEC International Standards. The latter provide the technical foundation that facilitates the building of effective, efficient, safe and affordable off-grid infrastructure and guide their design and installation.

IEC 62257 on rural electrification

In 2013, the IEC, together with the World Bank Group, the United Nations

Foundation, the US Department of Energy, research laboratories, universities and industries entered into a public/private partnership to provide developing countries with access to important technical documents. IEC TS 62257, *Recommendations for renewable energy and hybrid systems for rural electrification*, issued by IEC Technical Committee (TC) 82: Solar photovoltaic energy systems, is a series of Technical Specifications that outline international best practice solutions to support energy access in

developing countries across a range of technologies.

Through this partnership, the IEC offers discounts to qualified stakeholders purchasing documents in this series.

A “direct current” world

Over the last 20 years, several megatrends have created a groundswell of demand for low-voltage direct current (LVDC). The need to mitigate the effects of climate change has seen a renewed focus on energy efficiency and sustainability, taking power generation increasingly towards renewable sources and away from fossil fuels. In addition, the cost of energy generation from solar photovoltaics (PV) has become more accessible, while LED lighting has made the conventional incandescent lamp a thing of the past. These trends challenge the traditional model of electricity distribution via alternating current (AC). Also, many of the technical issues that blocked the development of DC are no longer an obstacle.

Without realizing it, today we live in a 'direct current' world, with most of our electronic devices already being able to use current that is produced by renewable sources directly, without conversion. Everything – from electric vehicles, renewable energy technology, kitchen appliances, lighting, transport, smartphones and tablets to systems with data and embedded electronics, i.e. the internet of things (IoT), smart homes, smart cities, etc. – runs on DC.

The IEC has recently set up a Systems Committee, SyC LVDC, tasked with providing systems level





Solar PV off-grid systems are a backup against daily power cuts in India, offering clean energy 24 hours a day (Photo: Sun&Wind Energy)

standardization, coordination and guidance in the areas of LVDC and LVDC for electricity access.

Essential partnerships

The IEC is not alone in its endeavor to provide electricity access to everyone everywhere. Over the years it has partnered with other international organizations to promote specific initiatives and projects in this field. Among them are the Alliance for Rural Electrification (ARE), the International Renewable Energy Agency (IRENA) and the Sustainable Energy for All (SEforALL), a nonprofit organization working with leaders in government, the private sector and civil society to drive further, faster action toward achievement of one of the United Nations Sustainable Development Goals, SDG 7, which calls for universal access to sustainable energy by 2030.

The ARE Forum

From 13 to 15 March 2018, IEC representatives will attend the fourth ARE Energy Access Investment Forum – *Integrating Remote Communities into Economies* – in Catania, Italy.

Since its first edition in 2015, the Forum has become a key event

where the clean energy off-grid sector gathers together to learn more about upcoming support schemes and initiatives by the public sector as well as the latest industry trends and product and service innovations from the private sector.

ARE collaborates with SEforALL through specifically-tailored interventions and the fourth ARE Energy Access Investment Forum has been identified as a key deliverable to enhance global efforts to promote

a level-playing field for decentralized clean energy technology and business solutions.

The ARE Forum is organized in collaboration with Renewable Energy Solutions for Africa (RES4Africa) and the Africa-EU Renewable Energy Cooperation Programme (RECP).

Registration is still open and the complete programme is available on the ARE website



The Magiro Micro Hydro Power Project in rural Kenya (Photo: Climate Action Challenge)

Primetime Emmy award for IEC, ISO and ITU

US Academy of Television honours 'High Efficiency Video Coding'

By Claire Marchand

Last October, the US Academy of Television Arts & Sciences awarded an Emmy for outstanding achievement in engineering to the expert group responsible for 'High Efficiency Video Coding', the video compression standard that has emerged as the primary coding format for ultra-high definition (UHD) TV.

A third Emmy for IEC, ISO and ITU

The Emmy recognizes the achievements of the ISO/IEC Moving Pictures Expert Group of ISO/IEC JTC 1/SC 29: Coding of audio, picture, multimedia and hypermedia information – a Subcommittee of the Joint Technical Committee ISO/IEC JTC 1: Information technology – and the Joint Collaborative Team on Video Coding, a team of experts representing the ITU Video Coding Experts Group of ITU-T Study Group 16.

In 2009, ISO/IEC JTC 1/SC 29 was awarded an Engineering Emmy for MPEG-4 AVC and in 1996 for MPEG-1 and MPEG-2 compression coding associated with, respectively,

still photography, video CD and MP3, and digital TV set top boxes and DVD.

High praise

The three organizations commended the team of experts for their achievement.

IEC General Secretary & CEO Frans Vreeswijk said: “My sincere congratulations to the team of experts behind this standard and a big thank you to the US Academy of Television Arts & Sciences for recognizing the importance of International Standards which are the result of fruitful collaboration between many countries and organizations.”

“It is a real pleasure to see the work of our experts recognized in this way”, stated Sergio Mujica, Secretary-General of ISO. “This group, which is at the forefront of innovation and technology in video, shows how successful we can be when we work together with a common aim.”

“ITU, ISO and IEC provide the technical foundations of the extraordinary innovation that we see in video,” added ITU Secretary-General



Emmy Award

Houlin Zhao. “I am pleased to join the US Academy of Television Arts & Sciences in celebrating the experts at the heart of this longstanding collaboration in international standardization.”

From AVC to HEVC

Video accounts for about 75% of all consumer Internet traffic, a figure expected to rise to over 80% by 2020. The majority of this video is

coded using International Standards developed in collaboration by IEC, ISO and ITU.

'High Efficiency Video Coding' (HEVC), published as ISO/IEC 23008-2 | ITU-T H.265, gains the recognition of an Emmy award for forging the path to UHD 4K and 8K TV.

HEVC is a significant evolution from its predecessor ISO/IEC 23008-2 | ITU-T H.265 Advanced Video Coding (AVC). The arrival of MPEG-4 | H.264 AVC in 2003 is credited with unlocking significant advances in video spanning HDTV to 3G mobile multimedia, a contribution to TV engineering recognized with a Primetime Emmy award in 2008.

HEVC was released in 2013 to support the next decade of innovation in video. HEVC uses half the bandwidth of MPEG-4 | H.264 AVC, delivering an HD viewing experience while concurrently enabling operators to utilize network capacity more

efficiently. The standard has proven especially valuable in accelerating the rollout of UHD.

HEVC enables high-dynamic-range as well as wide-colour gamut coding and has been selected as the primary format for the delivery of full 10-bit UHD video. The standard's support for synthetic content, 3D and multiview enables practical applications of virtual and augmented reality.

HEVC is at play in all UHD distribution channels, from mobile broadband to satellite, cable and fibre-optic communications. The standard is supported by all UHD viewing devices, whether traditional TVs, tablets or smartphones.

Ubiquitous HEVC

HEVC has been incorporated into the standards and consortium specifications of several organizations in addition to those of IEC, ISO and ITU:

- 3rd Generation Partnership Project (3GPP)
- Association of Radio Industries and Businesses (ARIB)
- Advanced Television Systems Committee (ATSC)
- Blu-Ray Disc™
- Digital UK
- Digital Video Broadcasting (DVB)
- European Broadcasting Union (EBU)
- European Telecommunications Standards Institute (ETSI)
- Ultra HD Forum

Gearing up for the future

The video coding collaboration of IEC, ISO and ITU remains as ambitious as ever. The collaboration is working towards 2020 with the aim of delivering a new video coding standard to succeed HEVC. The next-generation standard will again feature double the compression capability of its predecessor.



In October in Los Angeles, Joint Collaborative Team on Video Coding experts received an Emmy for the HEVC Standard (Photo: EEMS Group @ MIT)

Upcoming global events (March 2018)

On the agenda: Smart grid, energy and renewable energies

By Claire Marchand



The IEC regularly supports key global and regional industry events, which can present the IEC endorsement on their website and materials.

India Smart Grid Week 2018 New Delhi, India, 5-9 March 2018

India's leading electricity utilities, policy makers, regulators, investors, global smart grid experts and researchers will discuss trends, share best practices and showcase next generation technologies and products for smart grid and smart cities.

Internet of Energy Berlin, Germany, 6-7 March 2018

Hear from global experts about the business case for internet of things (IoT) in the electric utilities sector. On the agenda: grid interoperability, the smart home opportunity, preventative asset maintenance, smart metering, smart grids, cyber security and more.

4th ARE Energy Access Investment Forum & ARE Awards Catania, Italy, 13-15 March 2018

The clean energy off-grid sector gathers together to learn more about

upcoming new support schemes and initiatives by the public sector as well as the latest industry trends and product and service innovations from the private sector. The ARE Forum in 2018 is organized in collaboration with Renewable Energy Solutions for Africa (RES4Africa) and the Africa-EU Renewable Energy Cooperation Programme (RECP). It is the meeting place for 300+ participants from all over the world to identify and be introduced to the most interesting actors to present their own business proposals.

Intellisub Europe 2018 Düsseldorf, Germany, 10-12 April 2018

120+ utility substation asset management, engineering, operations & maintenance, and cyber security professionals will discuss investment drivers, new system architectures, operations & maintenance for new/refurbished substations in HV, MV and LV networks and more.

To view more events, please visit the IEC website at:
www.iec.ch/meetings/events/

New IEC appointments

IEC elects new Vice-President/Chair of the Conformity Assessment Board and new Treasurer

By Antoinette Price

Learn more about our new appointees.

Jo Cops

Belgian Jo Cops took up his new role as IEC Treasurer on 1 January 2018. As a member of the Executive Committee, he is responsible for IEC finances and will facilitate the decision-making process about strategic investments and project funding. He will report directly to the Council where all IEC Members are represented.

"I'm honoured to have been elected by the IEC membership and it is a real privilege to serve as Treasurer in times where standardization for present and new technologies is high on the agenda. In our fast-paced environment, focus on financials becomes essential since they reflect the operating performance of the IEC. Finance influences and is influenced by all other corporate functions. In that sense, being a Treasurer is no longer just about financial statements and



IEC Treasurer Jo Cops

bookkeeping, it also involves taking forward-looking actions supported by financial tools and techniques to give the IEC and its Members the added value they are looking for."

Cops has a Master's Degree in Engineering, and degrees in Business Economics, Digital Leadership

and Financial Management. With a career spanning over 25 years, he began working for Sony Belgium. He then held various management positions within Sony Europe, Belgian provider of media and telecommunications services Telenet, and Alpha Technologies Europe, with

responsibilities pertaining to sales, budgeting, pricing, marketing and strategic planning.

He has been involved in a number of standardization development organizations, including Secretary General of the Belgian Electrotechnical Committee (CEB-BEC) since 2013, and permanent delegate for Belgium in CENELEC, the European Committee for Electrotechnical Standardization, where he is a member of the Working Group Policy and the BT Efficiency group.

Shawn Paulsen

Since 1 January 2018, Shawn Paulsen is a new IEC Vice-President and Chair of the Conformity Assessment Board (CAB). In this position, he is responsible for the conformity assessment work of the IEC.

“I consider it a great honour and an equally great responsibility to be elected IEC Vice-President and Chair of the IEC Conformity Assessment Board. With the global recognition of the IEC Conformity Assessment Systems and growing market pressure to expand into new areas and seek new conformity assessment opportunities, this is a critical time for the IEC to be ready to meet these challenges. I see many exciting opportunities ahead for IEC Conformity Assessment, building on the very successful IEC CA systems that we currently have, and facing the future together.”

Currently, Paulsen is the Manager of Conformity Assessment within the CSA Group in Canada. He previously served as the Chief Electrical Inspector in the Department of Public Safety for the New Brunswick Provincial Electrical Regulator. In



IEC Vice-President and Chair of the Conformity Assessment Board Shawn Paulsen

this role, Paulsen was the Provincial representative on national codes, standards and conformity assessment committees.

With a career spanning over 35 years, Paulsen has significant experience in technical and policy standards work at both the national and international levels. He has been involved in the work of a number of organizations including the Canadian Standards Association, IEEE, International Association of Electrical Inspectors, ANSI, the National Fire Protection Agency (NFPA), and the Canadian Advisory Council on Electrical Safety. Paulsen has been a member of the

IEC Conformity Assessment Board since 2012 and has served as the Canadian representative to IECCE and IECRE.

Paulsen holds a Bachelor of Science in Electrical Engineering and is also a licensed industrial/commercial construction electrician.

In addition to being elected as IEC Vice-President and Chair of the Conformity Assessment Board, Mr. Paulsen was recently awarded the IEC 1906 Award for his commitment to international conformity assessment through his involvement with the IECCE.

Introducing the 2017 Young Professional Leaders

In line for top positions in standardization and conformity assessment

By Claire Marchand

The IEC Young Professionals (YP) Programme brings together upcoming expert engineers, technicians and managers from all over the world, who aspire to become more involved in the IEC and help shape the future of international standardization and conformity assessment in the field of electrotechnology. In this issue of *e-tech*, we introduce the three 2017 Leaders of the IEC Young Professionals Programme who were elected by their peers in Vladivostok, Russia, during the IEC General Meeting.



Annette Frederiksen

2017 YP Leaders

The YP Leaders act as ambassadors of the YP Programme and are an important connection between the Programme and its participants. As a follow-up to the YP workshop in Vladivostok, the YP Leaders reached out to their group of YPs to ask them to identify one or more project(s)/ working group(s), etc. of interest. The objective of this initiative was to help YPs take some concrete actions to increase their participation, wherever possible and in line with the YPs' National Committees, in a specific and relevant IEC activity. The YP Leaders are expected to attend the next YP workshop in Busan, Rep. of Korea, where they will lead several sessions and act as a link between the 2017 and 2018 YPs.

The three 2017 YP Leaders are:

- Annette Frederiksen, Germany
- Juan Li, China
- Jorge Richard Angulo, Mexico

Annette Frederiksen

Annette Frederiksen studied mechatronics at the Technical



University of Dresden, Germany, where she specialized in micro mechatronics and received her Engineering Diploma (Dipl.-Ing.) in 2009. In 2012, she received her PhD (Dr.-Ing.) from the Karlsruhe Institute of Technology (KIT), for her research on scanning laser projection systems. During her studies, she interned for the European Synchrotron Radiation Facility (ESRF) in Grenoble, France. In 2008, she joined Robert Bosch GmbH



The three 2017 YP Leaders were elected by their peers at the 81st IEC General Meeting in Vladivostok, Russia

while completing her diploma thesis and from 2009 to 2011, she took part in the Bosch PhD programme in cooperation with KIT.

Since 2011, Frederiksen, who holds five patents, has been working in the Bosch Corporate Research and Advance Engineering department, as part of the optics and optoelectronics group. Her work topics are simulation, development and prototyping of

new concepts for display and optical sensor technologies.

Frederiksen is actively involved in eye safety evaluation of complex laser products. She participates as an expert in several working groups (WGs) of IEC Technical Committee (TC) 76: Optical radiation safety and laser equipment. She is a member of WG 1: Optical radiation safety, WG 3: Laser radiation measurement

and WG 8: Development and maintenance of basic standards. She is also a member of DKE/GK 841, the German mirror committee of IEC TC 76. Since 2017, Frederiksen is the Secretary of CENELEC Technical Body CLC/TC 76.

Juan Li

Juan (Applejuan or Apple) Li received a Master's degree in Computer



Jorge Richard Angulo

Science Network Security from Sichuan University, China, in 2010. For the next four years she was a doctoral student in computer science – service-oriented architecture and industry management at INSA, the national institute of applied sciences in Lyon, France, where she obtained her PhD.

Upon completion of her studies, Li joined Huawei Technologies Co Ltd, where she became an industry development engineer with Business Development Manager and Framework Transformation Manager certifications.

Li has been working with several international industry standards organizations, such as TM Forum and The Open Group, on digital transformation of telecommunication operations. She has led and contributed to more than nine industry standards, including the first telecommunication industry digital maturity model (DMM), telco data monetization governance functions, digital payment ecosystem, business support system (BSS) key performance indicators (KPIs) for good customer experience, and others. She is hoping to expand her expertise in information and communications technology (ICT) related areas.

Jorge Richard Angulo

Jorge Richard Angulo has a Mechanical Engineering Master of Science degree from the Technological Institute of Celaya, Mexico, and has recently attended advanced courses on leadership and Big Data Analytics at ITAM, the Mexico City technological institute. Since mid-2016, he has been a Programme Manager at General Electric, with experience in product

R&D, engineering, productivity and technical compliance. He has worked on the business development of new innovative products, from conception to return on investment. During his career he has worked for small, medium and multinational companies in the medical, appliances and energy industries, based in Mexico, the US, Germany and Brazil. He has led several engineering teams, including a regional compliance team more recently. He is currently working on world needs with a special focus on analytics-big data and internet of things (IoT) by means of tangible, safe and energy efficient products.

Richard Angulo holds three granted patents in the appliance industry which endorse innovative products currently on the market. He is involved nationally with the mirror committee of IEC Subcommittee (SC) 23K: Electrical energy efficiency products, and with the mirror Systems Committee (SyC) on smart cities. He enjoys being a digital learner and is a passionate open water swimmer.

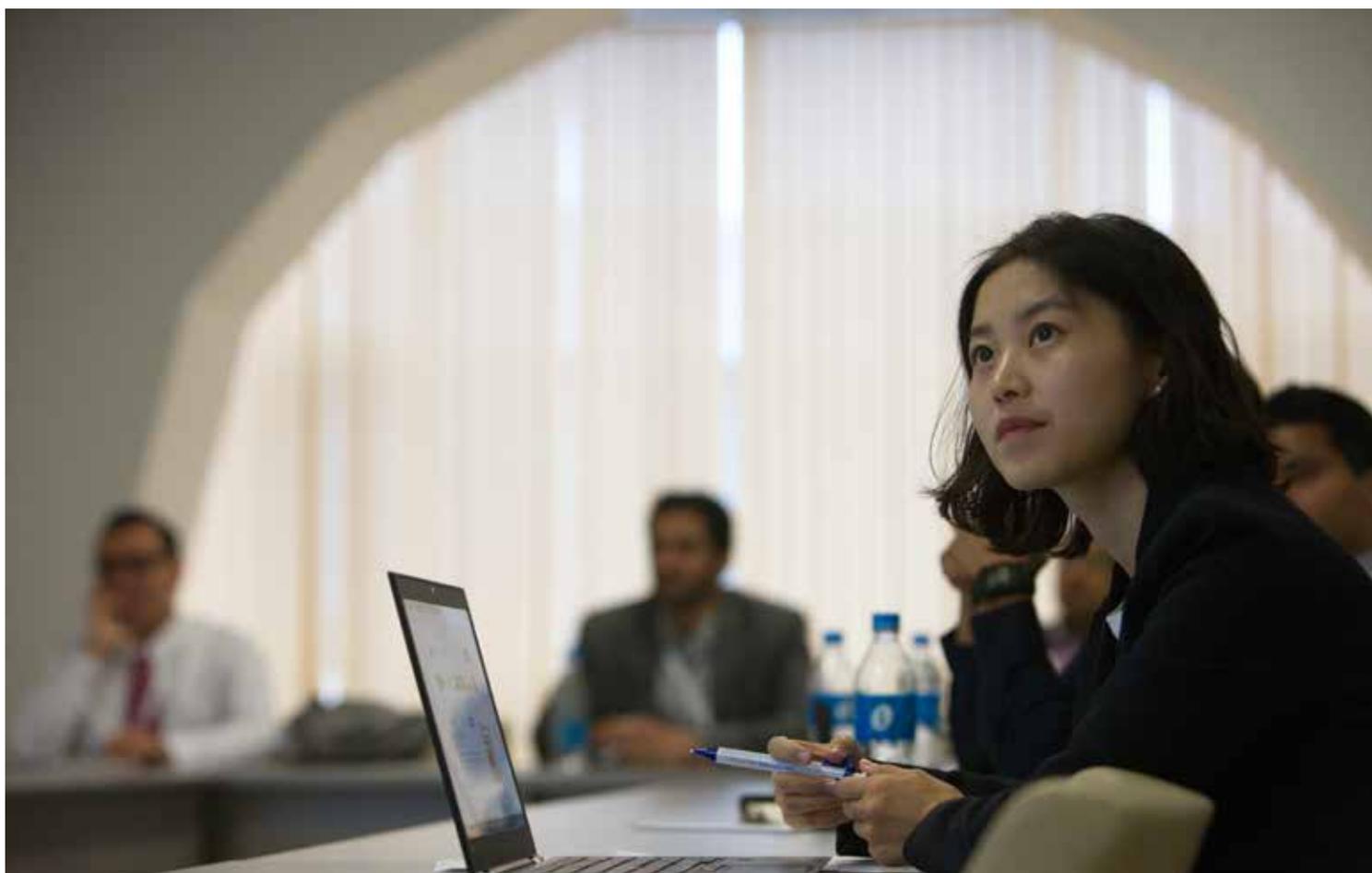


Juan Li

Taking the next step

The IEC Future Leaders Industry Forum

By Claire Marchand



The IEC Future Leaders Industry Forum gives IEC Young Professionals an opportunity to support the IEC MSB market and technology watch activities

Recognizing the need to ensure continuity in its standards development and conformity assessment activities, the IEC has, since 2010, reached out to up and coming young experts active in a variety of technological sectors through the IEC Young Professionals Programme and its annual workshop, held in conjunction with the IEC General Meeting.

A new opportunity for IEC Young Professionals

This year the Commission and its Young Professionals (YP) Programme is proposing a new initiative to give IEC YPs an opportunity to support the IEC Market Strategy Board (MSB) market and technology watch activities. The IEC Future Leaders Industry Forum will bring together IEC YPs who are experts in security in smart

infrastructures to share their insights on what challenges and opportunities lie ahead for the IEC in this area.

The Forum will take place in Munich, Germany, on 26-27 March 2018 and the outcomes will be published in a technology insight paper.

The forum will be sponsored by MSB member Siemens and will be moderated by VDI/VDE Innovation + Technology GmbH (VDI/VDE-IT), a

leading service provider for issues related to innovation and technology.

Before and during the Forum

Participants will be invited to discuss the following topics related to security in smart infrastructures and to make recommendations to IEC:

- Current industry landscape
- Top innovations that are expected to shape the industry in the coming years
- Anticipated standardization needs
- Anticipated conformity assessment needs

The following IEC National Committees have selected Future Leaders (from their IEC YPs) in the area of security in smart infrastructure to take part in the Forum: Australia, Canada, China, Germany, India, Italy, Korea, Singapore, Switzerland, UK and USA.

Benefits for Future Leaders and their employers

Participants will have the opportunity to network with top experts in security in smart infrastructures, learn more about IEC work in their specific field



The Forum opens with a visit to Siemens IT/cyber security lab

and influence future IEC standards development, conformity assessment and market strategy work through the technology insight paper's recommendations.

Employers will help support the IEC market and technology watch activities which influence the future of IEC standardization and conformity

assessment activities. They will also obtain advanced knowledge of the latest IEC developments in their field.

Both Future Leaders and their employers will gain exposure within the IEC community by appearing in the paper.

The Forum

The Forum will start in the afternoon of 26 March with an industry visit to the Siemens IT/cyber security lab, which will include a demonstration of a cyber attack on a supervisory control and data acquisition (SCADA) controller. A networking opportunity will then be offered in the evening during a welcome reception.

The next day will be entirely dedicated to discussions on security in smart infrastructures leading to the development of the technology insight paper capturing the essence of the discussions.



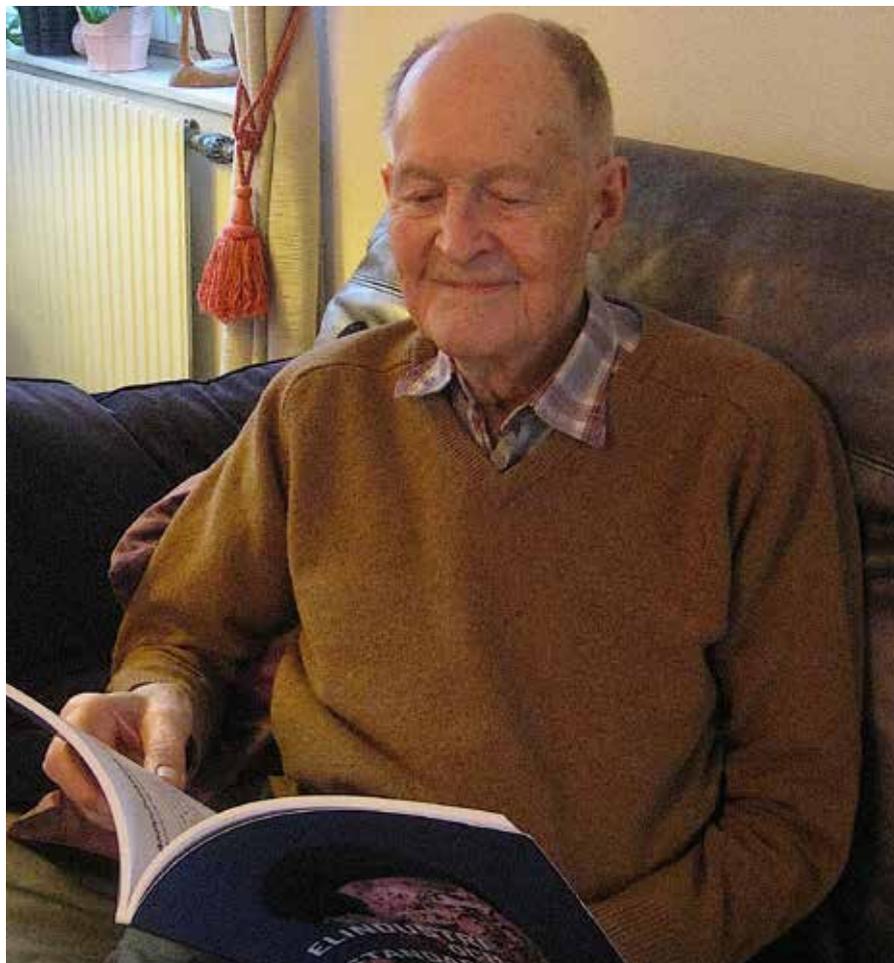
The topic of the Forum is "Security in smart infrastructures"

A life devoted to Standards

Interview with Jan Ollner

By Catherine Bischofberger

Jan Ollner was Executive Secretary of the Swedish National Committee (NC) from 1948 until 1956. This was a time of rapid change for the IEC, with Central Office moving from London to Geneva and a number of new technical committees (TCs) established in various fields, including IEC TC 34: Lamps and related equipment or IEC TC 35: Primary cells and batteries. The 97-year-old talks to us about the merits of standardization, his years as Swedish NC Executive Secretary and his work for ASEA (now ABB).



Jan Ollner reading his book "The Company and Standardization"

As Executive Secretary of SEK, the Swedish National Committee, you met Charles Le Maistre, the first IEC Secretary General, in the years after the war. How did that come about?

In 1948, I was the General Secretary of the IEC General Meeting (GM) which took place in Stockholm. That's where I met Charles Le Maistre, together with Assistant Secretary General Louis Ruppert, who succeeded him in 1953. To the young fellow that I was then, Charles Le Maistre was a very impressive man – at that point he had been IEC Secretary General for more

than 40 years! He had held the IEC fort in London during the war. Thanks to him, the IEC was able to emerge from the Second World War relatively unscathed and pick up where it left off, so to speak.

What were the changes you witnessed during your time as Swedish NC Secretary?

It was a very exciting time to be around. New technical committees were created on a regular basis. The number of IEC delegates increased greatly. A total of 150 delegates spread across 30 TCs attended

the 1948 General Meeting. As it so happens, I was involved in organizing the 1958 General Meeting which also took place in Stockholm, even though I was no longer Secretary of the Swedish NC. Around 1 200 delegates attended the 1958 GM. That gives you an idea of IEC growth over that period of time.

It was also an era defined by the Cold War. How did that impact the work of the IEC?

Despite the Cold War we worked with our Russian colleagues in a spirit of cooperation which I think has always

been one of the hallmarks of the IEC. I have fond memories of the 1957 General Meeting which took place in Moscow when Nikita Khrushchev had just got into power. I remember that there was a reception at the Kremlin which turned out to be quite a lavish affair with lots of caviar and vodka. The Russian delegates certainly made the most of the buffet! During my time as Secretary of the Swedish NC, a GM was held in Opatija, in former Yugoslavia, which was also part of the Eastern bloc at that time.

You visited IEC Central Office during that period...

Yes, I came to Geneva to prepare for the 1958 General Meeting. In those days, Central Office was located in a nice house on Route de Malagnou, in the countryside outside Geneva. The IEC shared the office with ISO and only six people worked there. Mr Ruppert's Secretary was Jean Marshall and funnily enough she had a namesake in ISO, Mr Roger Maréchal, who worked under ISO Secretary General Henry St. Leger. The relationship between IEC and ISO was pretty close in those days, so much so that Jean Marshall and Roger Maréchal actually got married! Both of them became very good friends of mine. I am still in touch with Jean Marshall-Maréchal who lives in Lyon.

(nb: The two organizations have indeed always been close. IEC Secretary General Charles Le Maistre was instrumental in the founding of ISO. He led the effort to establish the International Federation of the National Standardization Associations (ISA) in 1926, which was ISO's precursor. In 1944 he became Secretary General of the United Nations Standards Coordinating Committee (UNSCC), an interim organization which led to the founding of ISO in 1946.)

You were also an expert in one of the IEC TCs, IEC TC 2: Rotating machinery. Can you tell us more about your work with that TC?

Yes, I was Secretary of a now disbanded Subcommittee (SC) 2B: Mounting dimensions and output series. We were dealing with the standardization of electric motors used in machinery and factories. We had to make sure that all electric motors driving electric machinery had the same sizes and specifications. The thinking was that if all electric motors met the same Standards, then they would be easier to export and that would boost trade.

(nb: TC 2: Rotating machinery is still going strong today. It prepares International Standards regarding specifications for rotating electrical machines used in motors, with the exception of traction motors for railway equipment, and motors and generators used in electric road vehicles, industrial trucks or aeronautics and space applications. The TC developed the IEC 60034 series of International Standards which, among other things, rank electric motors according to their efficiency classes. Regulators everywhere in the world have taken on board this

classification system and made it part of their policies.)

You were an engineer for ASEA at the same time?

Yes. The company was called ASEA, before becoming ABB after the merger with Swiss company BBC Brown Boveri in the 1980s. Initially I joined the company in 1946, a couple of years before my stint at SEK. The Chairman of the ASEA board in those days was Sigfrid Edström. He attended the International Electrical Congress in St. Louis in 1904, which led to the founding of the IEC in 1906. I then went back to work for ASEA in 1957. I wrote a book about my years at ASEA, called *The Company and Standardization*. I explain how we set up the company's own standardization department which I managed. Its purpose was partly to simplify and facilitate the design and manufacture of ASEA products. As Senior Engineer, I eventually became Head of Technical Coordination Services. I retired in 1968 and became director of the Swedish Standards Institute (SIS). So you could say that I have always worked in and around Standards.



Engineers who attended the St Louis Electrical Engineering Congress, 1904

January 2018 nominations and extensions

The latest TC Chair nominations and extensions approved by the SMB

By Claire Marchand



Philip Wennblom, new of Chair ISO/IEC JTC 1 and Dr Jürgen Havemann, new Chair of IEC TC 5

Over the past few months, the Standardization Management Board (SMB) nominated several new Chairs for different IEC technical committees (TCs).

Jürgen Havemann

With a doctor's degree in steam turbine mechanical engineering from Moscow Power Engineering Institute and a professional career in that field spanning more than 35 years, Dr Havemann has been lending his experience and expertise to IEC TC 5: Steam turbines, since 2010. He was a member, then the Convenor of TC 5/Working Group (WG) 11 (disbanded); in 2015 he became the Convenor of TC 5/Maintenance Team (MT) 12: Maintenance of IEC 60045-1, of which he was a member since 2012. From 2012 to 2017, he was the Secretary of TC 5/AG 15: Chairman's Advisory Group

(CAG).

Dr Havemann is currently Senior Key Expert at Siemens AG Power and Gas Division – Steam Turbines in Germany, a company he joined in 1991.

He has been voted chair of IEC TC 5 for the period of 2018-01-01 to 2023-12-31.

Philip Wennblom

Since 1 January 2018, Philip Wennblom is the new Chair of the ISO and IEC Joint Technical Committee ISO/IEC JTC 1: Information technology.

Wennblom, who holds a Bachelor of Science (BS) in Electrical Engineering from the University of Pennsylvania, is Senior Director of Standards Policy for Intel Corporation, a company he joined in 1984 as design engineer. As part of the Government and Policy

Group, his team sets Intel standards policy positions and leads Intel representation in strategic standards-setting organizations worldwide.

Wennblom has been a member of the InterNational Committee for Information Technology Standards (INCITS) since 2002 and has served as Chairman of its Executive Board since 2013. He served as chair of the INCITS Finance Board Committee from 2009 until 2013; he received the INCITS Chairman's award in 2010.

Wennblom has served on US delegations to the ISO/IEC JTC 1 plenary since 2005 and has been head of delegation since 2013. At ISO/IEC JTC 1, he has participated in the Special Working Group (SWG) on planning, and he convened the SWG on management. He has participated in the ISO/IEC JTC 1 Advisory Group since it was formed in 2016.

Philip Wennblom has been voted Chair of ISO/IEC JTC 1 for the period 2018-01-01 to 2020-12-31.

Extension

The SMB has approved the extension of the term of office of Richard Schomberg, chair of IEC Project Committee (PC) 118: Smart grid user interface, for the period of 2018-01-01 to 2020-12-31.

Solar thermal first

Inaugural IEC publications for solar thermal electric plants

By Catherine Bischofberger

IEC TC 117: Solar thermal electric plants, publishes its first two Technical Specifications (TS) on solar radiation data sets.

Concentrating solar thermal power (CSP) technologies, which employ reflective material to concentrate

the sun's heat to drive steam or gas turbines to produce electricity, are used in solar thermal electric (STE) plants. The number of STE plants is rising around the world, together with the increasing reliance on renewable sources of energy.

According to the *Renewables 2017 Global Status Report*, from REN21,

an international non-profit association which is part of the United Nations environment programme (UNEP), emerging countries with high levels of solar exposure, no or few oil and gas reserves and with a political agenda that favours industrialization and job creation, are increasingly likely to adopt policies favouring the building of such facilities. Most new STE plants can store heat during the day and convert it into electricity at night, making solar thermal attractive for large-scale energy production. As STE plants are situated in sun-drenched areas of the world, they are also a source of predictable and reliable energy.

Spain leads the way

According to the REN21 report, while Spain remains the global leader in installed CSP capacity, new facilities have recently come online in countries including South Africa, China and Morocco. STE projects are on-going in India, Israel and the Middle East.

IEC TC 117 was established in 2011, following a proposal from the Spanish National Committee (NC), to draft International Standards in the CSP field. It augured the growth of CSP



STE plants use reflective material to concentrate the sun's heat (Photo: Mansouraboud68/Wikimedia Commons)

*Tower plants are one type of STE production unit
(Photo: Bartleby08/Wikimedia Commons)*



capacity across the world and the requirement for such Standards. The scope of TC 117 is to prepare International Standards for the conversion of solar thermal energy into electrical energy in STE plants. The Standards are expected to cover current different types of systems in installed plants:

- Parabolic trough
- Solar tower
- Linear Fresnel
- Dish
- Thermal storage

Blazing a trail

Simulation studies of plant power production are often required during the various stages of planning, design and building of an STE plant. A standard methodology based on the annual solar radiation (ASR) data set is used to generate data representative of a typical meteorological year and to extrapolate plant production over the long term.

As the Chair of TC 117 Werner Platzer explains: "For the financing of projects, we need a reliable, comprehensive and unambiguous calculation of future generation throughout the lifetime of plants. This can be predicted with representative meteorological data and a precise simulation and prediction of the yield using the meteorological data. The newly published Technical Specifications deal with the question of how to prepare such data sets."

TC 117 has issued its two first publications, IEC TS 62862-1-2:2017, *Solar thermal electric plants-Part 1-2: General – Creation of annual solar radiation data sets for solar thermal electric (STE) plant simulation* and IEC TS 62862-1-3:2017, *Solar thermal*

electric plants – Part 1-3: General - Data format for meteorological data sets.

The first Technical Specification defines the procedures for the creation of ASR data sets used in STE plant simulation. The document also describes the components and parameters of an ASR data set, including factors such as geographic and time identification.

The scope of the second TS is to reduce the efforts involved in preparing data exchange and to avoid misunderstandings rising from

the use of different data formats for meteorological data sets. It proposes one format which demonstrates:

- Suitability for common operation systems
- Suitability for satellite/model-derived data
- Suitability for measured data
- Suitability for combined data sets
- Suitability for typical meteorological years and forecasted data

The data format proposed has been inspired by the thesaurus on solar radiation proposed at EnvironInfo 2007.



Most new STE plants can store heat at night (Photo: Ken Lund, Flickr)

Is your IEC Standards library up-to-date?

New Webstore features help identify new editions, amendments or withdrawn publications

By Claire Marchand

The IEC Webstore, the one-stop shop for the purchase of IEC International Standards and other Publications, is now offering its customers new features that should help them keep up-to-date with their collections of IEC Standards.

Does your library of IEC publications need an update?

Until recently, customers who wanted to stay informed of new publications or amendments to existing publications could receive a monthly email alert, subscribe to the Just Published RSS feed, or consult the list on the Webstore homepage (where the pre-releases (PRV) are also announced). But at any given time, customers had to manually check their own publications to find out whether there had been any change in their status.

Starting in 2018, customers who have already bought standards can check directly from their previous orders whether their library of IEC publications is still valid or needs updating.

CISPR 22:2008 RLV	2016-11-21	Updated
This publication has been replaced by CISPR 32:2015		

IEC TR 62443-2-3:2015	2017-02-28	Valid
IEC 62443-2-4:2015	2017-02-28	Valid
A more recent version of this publication exists IEC 62443-2-4:2015+AMD1:2017 CSV		

CISPR 22:2008 RLV	2016-11-21	Updated
This publication has been replaced by CISPR 32:2015		

IEC 61214:1993	2017-10-03	Withdrawn
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How to proceed

On the library section of their account page, they can see if a new edition has been published by clicking on the publication number.

Similarly, they can see if an amendment to a specific publication has been issued, in which case the Consolidated Version (CSV) of the Standard is also available.

They can find out if a publication has been replaced by another. Or learn that a publication has been withdrawn.

The service is available for publications bought since April 2015, when the new IEC Webstore was launched.

Easy access to main information

Another new feature introduced recently deals with the information

available for each publication. Whereas previously the full abstract was displayed on the page – some publications had very long texts – now only the first few lines are shown

and you can click on “Show more” to read the text in its entirety. This offers potential or returning customers easier access to all information on any given publication.

The Sales and Customer Service team is always looking for ways to make visiting and purchasing from the Webstore a user-friendly experience.



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IEC 60079-0:2017 RLV

Redline version

Explosive atmospheres - Part 0: Equipment - General requirements

TC 31 | [Additional information](#)

Abstract

[PREVIEW](#)

IEC 60079-0:2017 RLV contains the International Standard and its Redline version. The Redline version is available in English only. The Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. The Redline version is not an official IEC Standard, only the current version of the standard is to be considered the official document.

IEC 60079-0:2017 specifies the general requirements for construction, testing and marking of Ex Equipment and Ex Components intended for use in explosive

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Additional information

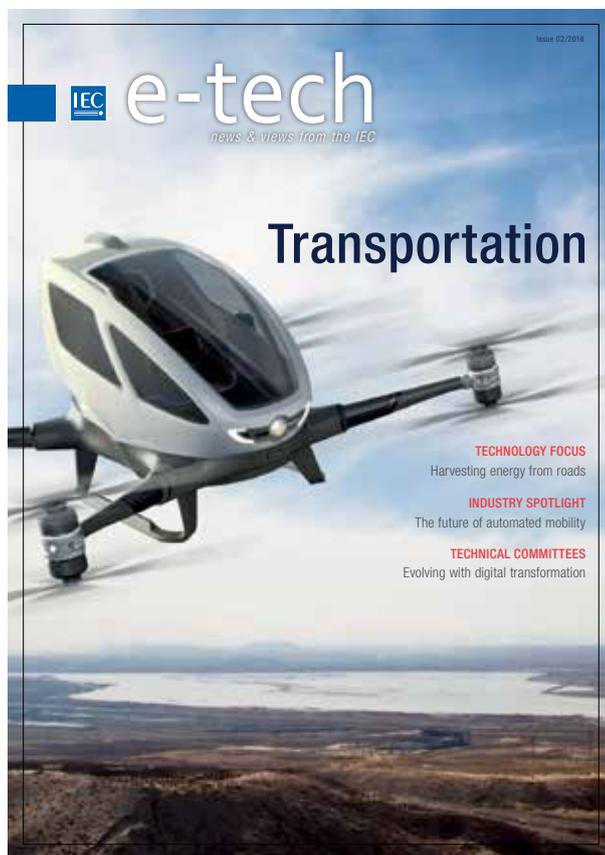
[Details](#) [History](#)

Publication type	International Standard
Publication date	2017-12-13
Edition	7.0

Easier access to all information on any given IEC publication - Click on "Show more" to read the full abstract

In the next issue:

Transportation - Issue 02/2018



The digitalization of transport is enabling upgrades to existing networks making them more efficient and increasing their capacity, while opening the door to completely new ways of travelling.

From drone taxis and green buses that recharge at bus stops, to connected cars with a growing number of automated features and smart railways, connectivity and artificial intelligence applications are being used to make transport safer and reduce pollution, energy consumption and congestion.

Our next issue looks at these trends and examines the latest developments and challenges faced by city and transport authorities, vehicle manufacturers and a rapidly growing number of travellers with different needs.

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