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ELECTRIC VEHICLES AND VEHICLE NETWORKING

United States National Committee of the IEC

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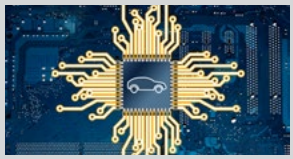

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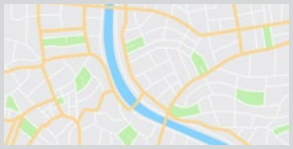

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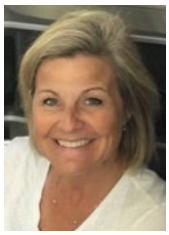
Patricia Sena, standards engineer, UL Standards & Engagement; and Heather Sakellariou, standards engineer, UL Standards & Engagement



UL first published requirements covering Electric Vehicle (EV) components and systems in 1996. These outlines of investigation, UL 2231-1, *Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits; Part 1: General Requirements*, and UL 2231-2, *Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: Particular Requirements for Protection Devices for Use in Charging Systems*, which were published as consensus standards by Underwriters Laboratories in 2002, cover devices and systems intended to reduce the risk of electric shock to users from accessible parts in grounded or isolated circuits for EV charging.

When UL 2231-1 and UL 2231-2 were first published, automakers in the United States were just beginning to introduce EVs to their production lines. Since then, the number of EVs in use has grown exponentially. Fully autonomous vehicles, including self-driving cars, have also started to enter the market.

As electric and autonomous vehicle technology has evolved, UL Standards & Engagement has maintained a consistent focus on safety for these products, publishing standards regularly and updating them as needed to address the safety challenges they present. These Standards include UL 2202, *the Standard for Electric Vehicle (EV) Charging System Equipment (1st ed 1998)*; UL 2251, *the Standard for Plugs, Receptacles, and Couplers for Electric Vehicles (1st ed 2002)*; UL 2580, *the Standard for Batteries for Use in Electric Vehicles (1st ed 2011)*; UL 2594, *the Standard for Electric Vehicle Supply Equipment (1st ed 2013)* and UL 4600, *the Standard for Safety for Evaluation of Autonomous Products 1st ed 2020)*.

Working Internationally

In 2011, representatives from the automotive and electric vehicle supply equipment (EVSE) industries in Canada, Mexico and the U.S. expressed a need to have common requirements to rapidly and safely build necessary EVSE support systems, as electrical infrastructure is essentially the same in all three countries. Industry representatives from each country, along with standards development organizations—namely the Association of Standardization and Certification (ANCE) in Mexico, CSA Group in Canada and Underwriters Laboratories in the U.S.—came together to form harmonization working groups and used the established UL Standards as the baseline documents to develop harmonized, trinational editions. These editions were published in accordance with each country's respective national codes: CSA C22.1, the Canadian Electrical Code, Part 1; ANSI/NFPA 70, the National Electrical Code; and NOM-001-SEDE, Electrical Installations, the Mexican Electrical Code.

As a result of this initiative, UL 2231-1 and UL 2231-2 were published as trinational Standards in 2013, along with UL 2251 and UL 2594. The harmonized titles are listed below:

» UL 2231-1/CSA C22.2 No. 281.1/ NMX-J-668/1-ANCE, UL 2231-2/ CSA C22.2 No. 281.2/ NMX-J-

668/2-ANCE, *the Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits; Part 1: General Requirements*

» UL 2251/CSA C22.2 No. 282/ NMX-J-678-ANCE, *the Standard for Plugs, Receptacles, and Couplers for Electric Vehicles*

» UL 2594/CSA C22.2 No. 280/ NMX-J-677-ANCE, *the Standard for Electric Vehicle Supply Equipment*

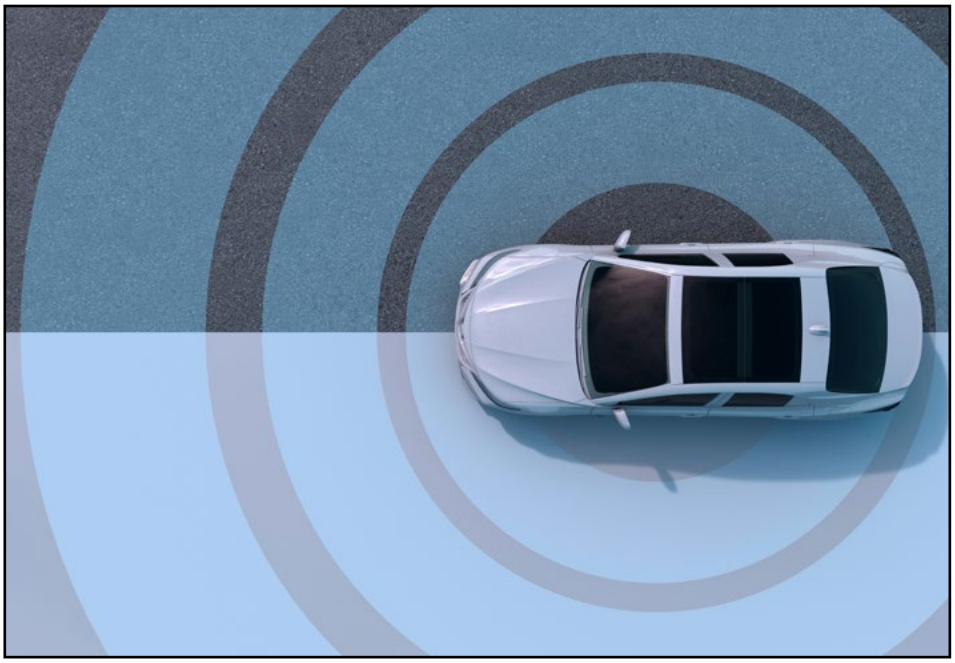
The harmonization working groups are still active today and continually update these Standards to address changing technologies.

Addressing Autonomous Technology

On April 1, 2020, Underwriters Laboratories published its first edition of UL 4600, the Standard for Safety for Evaluation of Autonomous Products. The Standard contains safety principles and processes to evaluate fully autonomous vehicles and other products that operate without any human driver supervision.

UL 4600 is unlike a traditional UL safety standard, as it illustrates a unique "safety case" approach to evaluating items covered by the Standard. A safety case is a structured argument, supported by evidence that provides a compelling, comprehensive and valid claim that a system or product is safe for a particular application in a specified environment.

Conformance to UL 4600 is validated by both self- and independent assessment. The standard itself is structured in a unique way using safety case criteria defined as Mandatory, Required, Recommended or Highly Recommended. UL 4600 is technology-neutral and non-prescriptive, while covering all aspects of autonomous technologies and functions. This approach provides



a framework that leads designers of autonomous systems through the required thought process to ensure all possible complications have been considered. Additionally, UL 4600 was designed to work with existing standards like ISO 26262, *Road vehicles — Functional safety — Part 1: Vocabulary*, and ISO 21448, *Road vehicles — Safety of the intended functionality*, to ensure that safety aspects are covered for the entire system of the vehicle and its support infrastructure.

Almost immediately upon publication of the first edition, the standards technical panel (STP) responsible for UL 4600 began to establish several task groups that would explore additional requirements needed to enhance the standard. These proposals were discussed and finalized during additional STP meetings and were then advanced through the standards development process using UL's Collaborative Standards Development System (CSDS.ul.com).

The second edition of UL 4600 was subsequently published on March 15, 2022, incorporating the additional proposals and a number of changes intended to advance clarity and consistency regarding safety case requirements, risk assessment, external versus independent assessment, self-audit versus self-assessment, sensor requirements, object tracking requirements and several terminology updates.

New Developments

Proposals are already underway to introduce autonomous trucking requirements to UL 4600. Requirements to truck-specific criteria will be proposed in the near future. One document for both trucks and passenger vehicles will aid with usability and familiarity for users of the standard, and will also allow for seamless maintenance and oversight of new developments for related products as they are developed.

The proposed binational standard for electric vehicle power export equipment, CSA No. 9741/UL 9741, is also currently in development as

Canadian and American requirements are being harmonized. These requirements cover both unidirectional and bidirectional equipment that is connected to an electric vehicle. Unidirectional equipment exports power from the vehicle to an off-board load, while bidirectional equipment serves the same function, but also provides power to the EV. This proposed standard is intended to help expand functionality of equipment that facilitates the safe export of power from electric vehicles.

Additionally, UL Standards & Engagement is currently developing UL 2750, *the Standard for Wireless Power Transfer (WPT) Equipment for Electric Vehicles*, which will provide requirements that cover wireless EV charging equipment. This equipment is intended to have a maximum rated input voltage to the power source of 600 V AC, 50 or 60 Hz.

How to Get Involved

Addressing electric and autonomous vehicle safety is an ongoing process. UL Standards & Engagement is dedicated to promoting safety through the development of consensus standards that help guide the performance and sustainability of ever-evolving technologies.

Our standards development process is open and transparent. Anyone can participate by submitting a proposal or commenting on a proposal through our Collaborative Standards Development System (CSDS) at CSDS.ul.com, or by applying for membership on one of our standards technical panels or technical committees. If you would like to share your expertise and help to develop standards for electric and autonomous vehicles, please submit an application for membership through our MyInfo Portal at s.UL.org/MyInfo. The consensus-based process relies on the input of diverse, knowledgeable experts who ensure standards are comprehensive, sustainable and focused on driving safety in line with the UL mission statement of working for a safer world. If you have questions about standards development, contact us at UL.org/contact.

UL and ULC Standards documents can be accessed through our free Digital View feature with site registration, and they are also available for purchase at ShopULStandards.com.

Looking for standards? Check out ANSI's webstore!

ANSI webstore purchases and standards subscriptions support USNC activities.

webstore.ansi.org

DECISION DEPOT

This column provides easy access to recent decisions that have been made regarding IEC and USNC policies and procedures that directly affect our members. Click the link below to access the recent decisions.

See the Decision List below for decisions made at the following meetings: *IEC Board meeting held on 2022-06-16 & 17; SMB meeting 174 held in Geneva (CH) on 2022-06-14;* and *CAB hybrid-meeting 51, Geneva, 2022-06-13 & 14.*

IEC Board: IB/100/DL

SMB: SMB/7645/DL

CAB: CAB/2224/DL

Calling All Sponsors!

USNC Welcomes IEC Members to the IEC 2022 General Meeting in San Francisco

The USNC is thrilled to host the IEC 2022 General Meeting October 31-November 4 in San Francisco! Check out our recently released host video!

Hosted annually by a different IEC member nation, the IEC General Meeting brings together international stakeholders for discussion of current issues and future directions and strategies for the IEC. The General Meeting has a unique format, combining management and technical meetings, and brining all the key players together on one stage.

Interested in becoming a General Sponsor for this once-in-a-decade, international event? Check out the 2022 IEC General Meeting USNC webpage and and the official 2022 IEC GM website. We are also accepting in-kind donations to help offset our costs. We are currently in need of items like power strips, monitors, extension cords, etc. to support the technical and management meetings. Contact us at IEC2022GM@ansi.org for more information!

Thank you to the organizations already on board as 2022 IEC General Sponsors!

Many thanks to our Technical Committee Sponsors whose specific support has helped bring their desired Technical Committee to the IEC General Meeting hosted by the U.S.

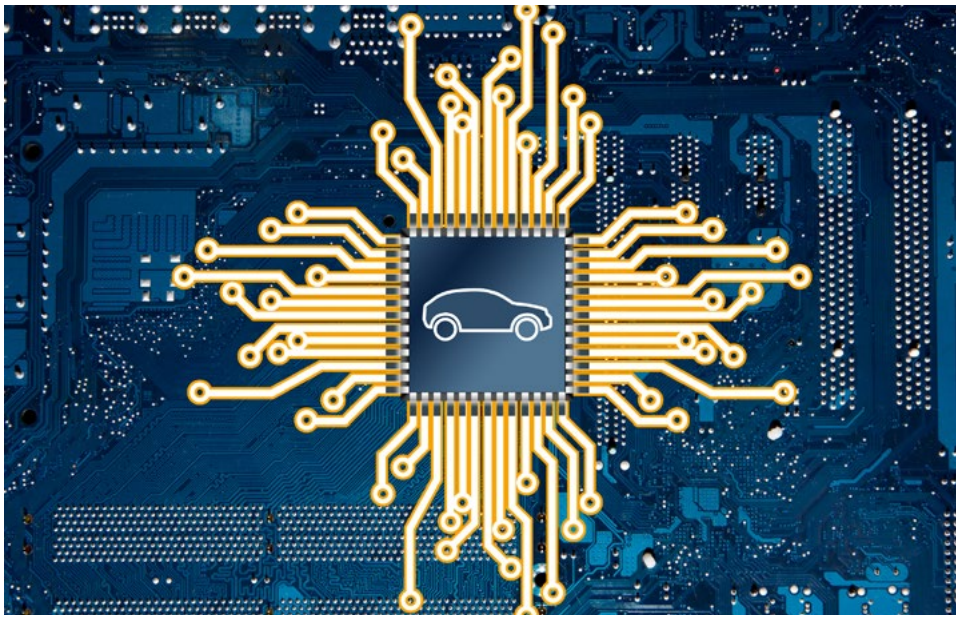
DIAMOND	ANSI, UL Standards & Engagement
PLATINUM	Consumer Technology Association, CORNING, intertek, legrand, NEMA, Rockwell Automation
GOLD	AAMI, CSA GROUP, DELL, EATON, element, FM Approvals, IEC United States National Committee, Microsoft, PHILIPS, Schneider Electric
SILVER	AHAM, IEC United States National Committee, FDA, pti power tool institute, inc
BRONZE	FIGARO
GENERAL	ABB, Elite, MSA, SEL

New Standards for Wide Bandgap Power Semiconductors Will Enable Energy Efficiency and Performance, Including for Electric Vehicles and IOT

by Stephanie Watts Butler, PE, PhD, WattsButler LLC, Co-Convenor TC 47/WG 8

According to a recent International Energy Agency report, "Wide Band Gap (WBG) technology has the potential to provide a paradigm shift in performance and energy efficiency over the well-established and mature silicon-based power technologies currently in use." [1] The two wide bandgap technologies in production today are silicon carbide (SiC) and Gallium Nitride (GaN).

"Globally nearly 100TWh per year could be saved through the application of new WBG technology for data centres, electric vehicles, laptops, mobile phones, and renewable energy generation. This is equivalent to the total annual electricity consumption of the Netherlands. Substantial additional energy savings could also come from employing WBG technology in motor driven systems."[1] The Department of Energy (DOE) also recognizes the importance of WBG based semiconductors to power electronics and the increasing application of power electronics in everything and everywhere, so much so that



WBG semiconductors was part of the recent DOE's assessment of the semiconductor supply chain and their strategy for securing America's clean energy supply chain.[2] The European Chip Act includes specific WBG tasks, again demonstrating how important WBG is to an energy efficient world future.[3]

To enable the rapid application of WBG semiconductors much earlier in the technology life cycle compared to previous new semiconductor technologies, standards and guidelines for Reliability Procedures, Test Methods, and Datasheet Parameters is needed. A dialogue around this concept at a conference in 2015 ultimately led to the formation in 2017 of a new JEDEC committee (JC-70) for Wide Bandgap Power Electronic Conversion Semiconductors.[4] This committee is only focused on behaviors unique for WBG compared to silicon.[5] JC-70 has now reached 67 members world-wide,

1 International Energy Agency 2022 "IEA Technology Collaboration Programme on Energy Efficient End-Use Equipment (4E) Annual Report 2021" All rights reserved. https://www.iea-4e.org/wp-content/uploads/publications/2022/04/4E-2021-Annual-Report-FINAL.pdf

2 https://www.energy.gov/policy/securing-americas-clean-energy-supply-chain and https://www.energy.gov/sites/default/files/2022-02/Semiconductor%20Supply%20Chain%20Report%20-%20Final.pdf

3 https://digital-strategy.ec.europa.eu/en/library/european-chips-act-staff-working-document 12 May 2022 "European Chips Act: Staff Working document"

4 https://www.jedec.org/committees/jc-70

5 T. McDonald and S. W. Butler, "Progress and Current Topics of JEDEC JC-70.1 Power GaN Device Quality and Reliability Standards Activity: Or: What is the Avalanche capability of your GaN Transistor?," 2021 IEEE International Reliability Physics Symposium (IRPS), 2021, pp. 1-6, doi: 10.1109/IRPS46558.2021.9405225.

making JC-70 the 3rd largest and fastest growing JEDEC committee.[6] Reliability is no longer considered a concern and one of the reasons for growing GaN and SiC markets in 2020 according to leading Market Research companies Yole and Omidia; Yole specifically cites the JEDEC committee.[7] [8] The impact of the standards work is not only an industrial impact, but also influencing the technical community. For example, publications which reference articles mentioning JC-70 and JEDEC have an above average citation factor as measured by the Field Citation Ratio from Digital Science's Dimensions Platform.[9]

At the same time that JEDEC was examining WBG standards, so were other standards organizations, such as JEITA in Japan, which led to discussion about opportunities for wide bandgap power conversion standards being published by IEC. Based upon these discussions, the United States sponsored a project, based upon JEDEC JC-70 document JEP173 "Dynamic on-resistance test method guidelines for GaN HEMT based power conversion devices", which utilized the IEC Fast Track document process and became IEC's first publication on wide bandgap devices for power conversion.[10] Japan sponsored some new work projects within IEC as well, and those documents published within a few months after the first WBG Document.[11] [12] [13]

Ultimately, discussions among JEDEC and other country organizations led to the foundation of a new IEC working group in TC 47 (Semiconductors) - WG 8: *Wide bandgap technologies – Power electronic conversion*.[14] WG 8 has created its first work project based upon fast tracking JEDEC JC-70 document JEP180 "Guideline for Switching Reliability Evaluation procedures for Gallium Nitride Power Conversion Devices".[15] At the annual TC 47 meeting in November 2021, an action was taken to approve all JC-70 documents for the fast track IEC document process through WG 8.[16]

The rapid progress being made by IEC on WBG for power conversion demonstrates the importance of WBG to the various countries' strategies for energy efficiency and net-zero emissions. The progress also shows how the various national committees and their experts can work effectively together to make rapid progress benefiting the entire world.[17] TC 47 will be meeting together in San Francisco at the 2022 IEC General Meeting, and WG 8 will meet to progress WBG standards.

6 T. McDonald and S. W. Butler, "Wide Bandgap Quality and Reliability Standards: JEDEC Delivers" 2022/3/24, Paper IS21.2, The Applied Power Electronics Conference (APEC)

7 Ibid.

8 https://www.semiconductor-digest.com/gan-and-sic-power-semiconductor-markets-set-to-pass-1b-mark-in-2021/

9 T. McDonald and S. W. Butler, "Wide Bandgap Quality and Reliability Standards: JEDEC Delivers" 2022/3/24, Paper IS21.2, The Applied Power Electronics Conference (APEC)

10 IEC 63373:2022 "Dynamic on-resistance test method guidelines for GaN HEMT based power conversion devices" https://webstore.iec.ch/publication/68515 based upon JEDEC JEP173 https://www.jedec.org/standards-documents/docs/jep173

11 IEC 63284:2022 ED1 "Semiconductor devices - Reliability test method by inductive load switching for gallium nitride transistors"

12 IEC 63275-2:2022 ED1 "Semiconductor devices - Reliability test method for silicon carbide discrete metal-oxide semiconductor field effect transistors - Part 2: Test method for bipolar degradation due to body diode operation"

13 IEC 63275-1:2022 ED1 "Semiconductor devices - Reliability test method for silicon carbide discrete metal-oxide semiconductor field effect transistors - Part 1: Test method for bias temperature instability"

14 TC 47 (Semiconductors) - WG 8: *Wide bandgap technologies – Power electronic conversion* https://www.iec.ch/ords/f?p=103:14:715841420956666::::FSP_ORG_ID,FSP_LANG_ID:27401,25

15 Project IEC 63419 ED1 "Guideline for Switching Reliability Evaluation procedures for Gallium Nitride Power Conversion Devices" https://www.iec.ch/dyn/www/f?p=103:38:8491083192696::::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1251,23,107553 based upon JEDEC JEP180.01 https://www.jedec.org/standards-documents/docs/jep18001

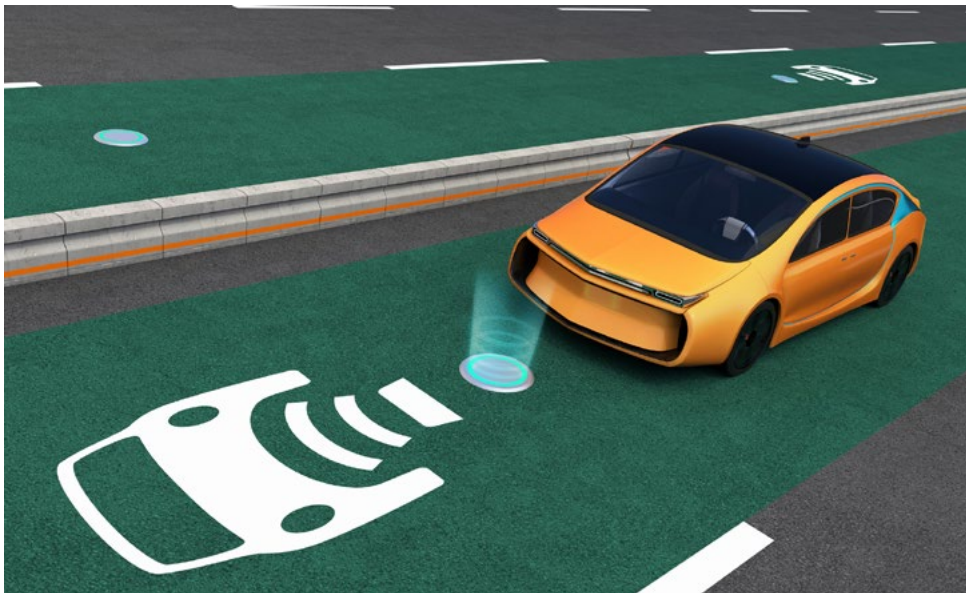
16 https://www.jedec.org/committees/jc-70

17 T. McDonald and S. W. Butler, "Wide Bandgap Quality and Reliability Standards: JEDEC Delivers" 2022/3/24, Paper IS21.2, The Applied Power Electronics Conference (APEC)

Electric Vehicle Wireless Charging Developments: What to Keep In Mind

by Kirk Palmer, department manager–battery safety, battery performance and electrical safety, Intertek

As EVs become more popular, and the world becomes more connected, the demand for wireless charging is growing. In fact, many in the industry believe that mastering wireless power transfer (WPT) is one of the keys to greater and faster widespread EV adoption. The ease for charging the vehicle makes driving it a more attractive, convenient option. But as the industry perfects this technology and integrates wireless charging, there are safety and performance considerations to keep in mind.



WPT Process

During the WPT process, the EV is parked on wireless charging pad, which serves as the EV Supply Equipment (EVSE). Once the EV and charging station connect, the process begins without the need for a corded connection. Instead, power is transferred through a magnetic resonance field between the charging station and a receiving pad on the bottom of the EV. After passing, the energy converts from alternating current (AC) to direct current (DC) to charge the EV batteries. The process is not only efficient, but convenient and, if done properly, safe.

Interoperability

Wireless products that connect with each other, such as EVs and charging systems, rely on devices and components that exchange, share, and interpret data to "talk" with each other. Interoperability is critical to ensure systems form an integrated ecosystem within the charging environment, communicating with one another seamlessly.

Ensuring interoperability requires several considerations and evaluations. Simulation testing can be effective for evaluating scale, security, and reliability while accounting for other device(s), interference, data, or other concerns. Usability accounts for end-use and human interactions in the "real world" to ensure products meets the consumer's expectations as they interact with other connected products, networks and the overall IoT infrastructure. One of the most straightforward assessments in product development is validating performance. Similarly, benchmark testing evaluates against similar products. Regression testing plays a key role in making sure previously developed software continues to perform once it has been altered, interfaces with other software, or when new features are added during development. It also safeguards performance during updates, enhancements, and configuration changes. Finally, cybersecurity evaluations ensure products keep data secure and do not infect other devices.

Testing components for interoperability ensures they will work together in a secure manner, without sacrificing performance. The "Plan, Do, Check, Act" assessment approach is one used by information security management systems for cybersecurity assessments and offers an effective framework for interoperability considerations. Once interoperability considerations are made and testing needs are identified, an approach should be developed using a four-stage "Plan, Do, Check, Act" system to fully assess interoperability:

» Plan: Identify improvement opportunities within a product and/or its systems. Using this information, identify and mitigate

risk, develop an action plan and effectively address any issues.

» Do: Conduct evaluations and assessments, collect analytics and data, and document issues and failures. It is important to keep all the information from this stage on hand for future use, whether that is redesign of the current product or for future projects and product development.

» Check: Review and analyze results from the previous stages, evaluate current processes and determine causes of failures. Utilize this information to determine whether interoperability is achieved or whether necessary improvements were made, and corrections have worked. As with other steps, documentation is important.

» Act: Based on the previous stages' observations and failures, implement changes to whatever did not work and continue practices that did. If problems persist, return to the previous stages until interoperability is met. Continue to reiterate the process until products adequately meet interoperability requirements.

EMC

Along with interoperability, considerations for electromagnetic interference (EMI) and electromagnetic field (EMF) limits are critical. In an increasingly connected world, it can be assumed that the EVs and charging stations will regularly encounter other electromagnetic fields from other devices. It is important to ensure that the fields coming from one electrical/electronic device do not interfere with the function of another electrical/electronic device in the vicinity. This means ensuring the EV and EV supply equipment (EVSE) do not impact each other or other devices and that they are not affected by other electronics in the area, such as a cell phone, wireless device, security monitoring systems, medical devices, or any other number of products.

EMC considerations should be made during the product development stage to mitigate risk and reduce EMI in the final products. Assessments should also be run to ensure optimal EMF ranges and performance and function of EVs and wireless charging systems in relation to each other and other electrical and electronic devices.

Safety

Safety considerations will be of utmost importance for the relevant charging components in the EV, the EVSE and the interface between the two. During the WPT process, safety considerations need to be made for powering the transmission pad, which is wired to the grid, the receiving pad in the vehicle, the vehicle itself and the EV batteries. It is important to ensure power is transmitted, energy is converted, and the batteries charge correctly and safely including varying of environmental conditions such as extreme hot or cold temperatures and water-based events including rain and snow.

Designers and developers will need to ensure the process happens without incurring shock, overheating, fire or harmful injury to both people and property. Designing products to mitigate risk is important, as is testing components and finished products to industry standards. Running assessments throughout the product development stage is critical to ensuring safety and can help reduce time and costs associated with redesign and re-evaluation of problem areas.

SAE J2954

To aid in the creation of wireless EV charging, SAE International created the first global standard that specifies requirements for EV and EVSE. SAE J2954 was introduced in October of 2020 to ensure safe, efficient methods of wirelessly transferring power from grid supply to an EV vehicle without human interaction. It covers systems with an 11-kW universal ground assembly and is designed to help insure interoperability, safety, emissions, and effective wireless communications.

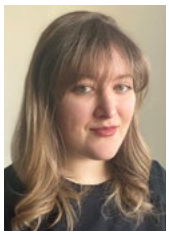
Best Practices

When designing and implementing wireless charging technology into EVs and EVSE, it is important to be mindful of interoperability, EMC, communications and safety from the early stages of the development process. Knowing the requirements and standards in place is essential to ensuring products are compliant, but also that they fulfill consumer demands and needs. Keeping these items in mind from the start can help avoid time delays and increased costs from product redesign and testing.

Many of these considerations will also help to ensure optimum performance, meeting industry needs and customer demands. In turn this helps ensure product success, build brands and enhances manufacturer reputations. Making products that function well, interact and communicate effectively and function safely will help advance the adoption of EVs. Wireless charging options that are also efficient and safe can make a difference in the future of the industry. Be mindful of industry requirements and trends, work within your team to ensure all considerations and assessments are made and find an effective partner to help in creating these innovative products and bringing them to market.

Newly Revised ANSI/CTA Standard for In-Vehicle Power Amplifiers

by Emily Hoefer, TAG Secretary for IEC TC 100 and IEC TC 124, Consumer Technology Association



Industry standards serve many purposes, from increasing safety and efficacy to providing best practices. Standards can also help consumers compare products and make informed decisions. This is particularly true of both vehicle and audio standards developed by the Consumer Technology Association (CTA).

CTA's standards program creates the blueprints behind many popular technology products. Closed captioning, sending high-speed DTV signals, and improving the accuracy of sleep tracking and heart rate monitoring are all part of CTA library that has produced over 135 standards and has provided the technology industry transparency and insight since 1924.

One example is CTA's Audio Systems Committee (R3) recently revised ANSI/CTA-2006-D, Testing and Measurement Methods for In-Vehicle Audio Amplifiers. The Committee's goal when originally developing this standard and its associated logo program, was to provide a level playing field and empower consumers to compare relative products to help end some of the wide disparity in amplifier power claims. Along with the release of ANSI/CTA-2006-D, an updated product mark will be made available for use in the coming months. In order to use the logo associated with the standard, suppliers must use a third-party test house to verify compliance with the standard. If the CTA-2006-D logo is present, consumers can be assured they are seeing the real watts output by the amplifier rather than artificially inflated numbers.

ANSI/CTA-2006-D defines characteristics that, considered collectively, describe the performance of Power Amplifiers designed for In-Vehicle applications, as well as provides rating measurements such as maximum and minimum input signal. One of the updates in this revision is the inclusion of Maximum Dynamic Power.

Maximum Dynamic Power is defined as a short-term power rating that can be delivered with a burst signal representing the amplifier's maximum usable music power headroom above its continuous rated power when driven to 10% Total Harmonic Distortion Plus Noise (THD+N). In layman's terms, this is the maximum watts output by the power amplifier without causing unacceptable distortion to the music.

Setting a rating measurement for Maximum Dynamic Power was particularly important to help curb consumer confusion about power amplifier claims versus reality. When developing the rating measurement for Maximum Dynamic Power, the Committee focused on creating meaningful, repeatable measurements that made sense for real-world testing of power amplifiers.

Standards like ANSI/CTA-2006-D can help both consumers and industry alike. Consumers want to make informed decisions and purchases, and industry wants to have a consistent and reasonable metric that can be applied across the industry.

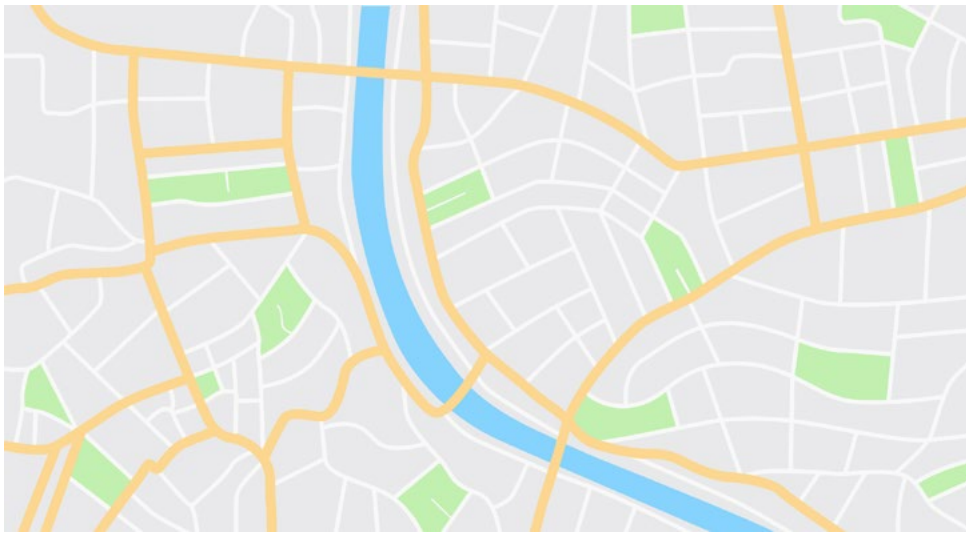
To learn more about ANSI/CTA-2006-D and CTA Standards in general visit www.cta.tech/standards.

Nothing is New, yet Everything is Changing. I Wish We Had a Map for That!

by Edward Van Vooren, TAG Technical Advisor for IEC TC 112, Deputy Technical Advisory for IEC TC 15, Convenor of TC 112 / WG 6, ELTEK International Laboratories

Learning and helping

I have been involved in IEC standards work through the USNC since 1981. As an old saying goes; back then things were different. During my early years of participating there were no real training programs to participate in standards work. It was basically just follow along with "the old guys" they must know what to do and how to do it. For me the learning curve was based on getting to know a few amazing individuals who took time to explain things to me, to be my mentors.



During my more than 40 years of participating I have seen so many young professionals joining one of our USNC TAGs or come to an IEC TC or SC meeting with interest to become more involved. Far too often many of these first timers do not return or return for only for one more meeting. I expect one of the main reasons for the short duration is they are not able to gain an understanding to the flow of work, the structure, how things get done. Individual documents are discussed in detail without any inclusion of how the organization gets any document from discussion to publication. Perhaps feeling unable to easily connect into the structure. I recall my feelings during my early experiences. A lot to learn, to understand, to finding how things work. Wanting to retain new interested members is my personal goal for continuing to find ways to help new members gain an understanding early on. The questions: What can we do? How to help new interested and energetic members return?

Today we have so many means of communication with people. Written correspondence has never been easier or faster. Type something, if no wiggle lines appear, hit the send icon. Done! We have webinars with the ability for people to participate during the original webinar and to save the presentations for people to come back to after the original presentation completed. We have videos, PowerPoint presentations, You Tube, the list goes on.

The options of ways and means to correspond increases. The structure of communications change. However, the original concept remains the same; how can we help the newer members increase their understanding of how things work at the levels of domestic and international standards. How to help these new members decide they can become more constructively involved, to remain as member of a TAG and to become members of TC Working Groups.

What is the best means for communication?

This is perhaps the easiest question to answer. The best means is the one that works. Simple. The challenge is finding the one which works. Since we have so many options it must be that each approach to convey information must work for some, perhaps not for all.

The facet which seems to be the cornerstone of what is the best is any approach which allows for a more one-on-one give and take, a way for each interested person to go over a subject at their own pace. This is what I found when I encountered the IEC Mapping platform. It is available on the IEC website. Just enter the word "tools" in the search line and the full list of available tools appears on screen. Mapping is one of the tools

on the screen. (www.iec.ch then select "tools")

I found this mapping tool completely by accident. I was searching for information I could use to write yet another article with the intent to share some insight into the structure of one Technical Committee. Call it another article or paper or by any other name, it is still what I will call two-dimensional; lacking the ability to provide depth at a level of interest to the reader.

Mapping

Is Mapping new? I do not think it is. It was new for me the day I found the IEC Mapping tool.

What aspects of Mapping gave me the features I was looking for? The flexibility of structure. The ability of a use/reader/ interest individual to move through the information at their individual pace and to their level of interest. Mapping has the ability to present information in layers of linked information. This I will refer to as being three-dimensional.

My simplest description, Mapping allows the user to look at the content in a quick overview rate or to dwell on any aspect for any length of time. I found the beneficial difference between Mapping and other commonly used techniques to be the movement through the information. Mapping is not one or two directional. The user can move between objects at any rate, move to a different object and return or continue to move on. To remain on points of personal interest, to move on for points of lower interest.

IEC TC 112 as the example

For the specific example I refer to the IEC TC 112 Map: TC 112: Evaluation and qualification of electrical insulating materials and systems. The role of TC 112 is to develop and maintain test standards for a wide range of electrical insulating materials and electrical insulation systems. These test standards are intended to provide a standard test procedure or methodology usable by one or more TCs/SCs without restricting the application. Performance and/ or safety requirements are expected to be developed by the IEC TC responsible for the applications.

This relationship between IEC TC 112 and a group of electrotechnical product TCs was my topic. The challenge was how to give a better presentation. Afterall, 30-plus years of writing has not accomplished all that much. If writing was the optimum approach I would not have been trying once again.

I somehow came across the Mapping tools link. Mapping is basically visual. Another old saying, a picture (visual) is worth a thousand words (non-visual). When I first discovered the Mapping platform under IEC tools, there were a small number of example maps. At that time no TC had developed and released a map. Seeing the structure I was looking for, I used the guide and the training sessions provided. Next, contact someone with the experience to answer my start up questions. IEC CO has the support group in place.

Excited and lost

It may be helpful to go to the IEC website and open the TC 112 map as you read the following.

On the IEC home page website, search for TC 112 dashboard. The TC Map can be found in the Further information box on the right-hand side of the home page; click the link of the map.

Excited because the mapping platform gives a very flexible structure. Lost because the mapping platform is a very flexible structure. There is no pre-set structure of a map, no one size fits all approach. A map is designed to cover the goals of the individual TC or SC. This made the initial development exciting, you can be creative, and disappointing because the goal is to provide information in a usable form without much in terms of examples. No dancing elephants, no animated jeeps driving up a chart. Convey the structure of the individual TC. There is no right or wrong, no best or poor designs.

Once the basic style is decided the power of the mapping platform begins to emerge.

For TC 112, the development was to draft a starting design with I had in a Word format (I was preparing to write yet another paper). I used this as my starting point because I was familiar with the manner of trying to convey information. The map developed using this as the starting point in combination of several remote sessions with the TC Chair Johan Smit and Secretary Bernd Komanschek to discuss the content, redesign, add text, link information. Each draft and discussion advanced the map.

Flexibility

The first completed part of the TC 112 design was to have the scope of TC 112 and its WGs linked. Then to expand the content. The mapping team at CO have a lot of information in place making it easy to link IEC information to objects in the map once the format is understood. The IEC mapping platform has an amazing amount of information ready to be adopted into a map in a copy-into format.

Once the structure of the TC and WGs was in place, it is easy to link standards the appropriate under each WG. This is what I am referring to as layers; the top layer is the overview. Clicking on any content box opens the layer below with more depth. This layering expands the content from the overview of TC 112 with the description of each WG to have the complete list of all standards. The

standards under each WG of TC 112 appears under the link to that WG. Clicking on any individual standard connects the user to the IEC webstore and to the specific standard. Now the user has the overall structure to details of standards, to the summary information about each standard. This is not new information; it is linked information without leaving the map.

Next, link all TCs and SCs with liaison with TC 112. Show the interconnection. Again, the amount of information selected was already in place by the CO Mapping team and available. Open and close any layer. Stay or move on at the pace of individual interest in the information.

Focus on the overview content of the top layer of the map. Once the base structure is in place, add the lower layer(s).

The map continues to evolve

Ask and answer your own questions as you go. What else could assist users about the overall structure of any TC? Solution: Added links to "More information about IEC TC 112". A drop-down box with an introductory explanation that there are four basic types of stress factors which relate to operating life and performance of any electrotechnical product.

Add more information. Solution: add another drop box explaining the IEC structure of each NC to add experts to any TC WG without limits. However, being an expert member of any WG does not place any expert on any Project Test [PT] for each new work approved nor on any Maintenance Team [MT] for review and revision of established standards. A very important aspect of the structure of each TC and SC. For more information on the TC structure go to the Good Working Practice [GWP] of the TC.

Link other IEC TC and SCs. Solution: Place the full list of TCs/SCs with liaison into two subgroups; one group with similar purpose as TC 112, a TC which develop standards for adoption by other electrotechnical product TCs. The second being the electrotechnical products TCs/SCs. Adding to the larger overview.

Map Updates/ Revisions / modifications

Each Map must have one individual designated as the Map Content Manager [CM]. Content updates, revisions, and modifications are handled through the map CM. Viewing and use of the TC map is open to any user.

Nothing new yet everything is different

Mapping can but does not need to offer new information. The benefit of mapping is to arrange the existing information accessible on one map. Active links to existing information without leaving the map. Opening links, remaining on any linked information at the user's pace, seeing organization structure are the benefits of the IEC Mapping platform. Giving members the means to gain a better understanding of this is the purpose of developing a TC/SC map.

At the time of development of the TC 112 map, active links in the IEC mapping platform are limited to IEC information. While interactions with other standards organization can be included in any map, it is not possible to have an active link to non-IEC content. The IEC is interacting with other non-IEC organizations to arrange for make hot-links between organizations. Watch the IEC website for updates.

Feedback helps improve any map

The IEC TC 112 map was presented in one webinar hosted by NEMA. The response was very positive. Based on questions during this webinar resulted in suggestions on further improvements which are being considered and under review by the leadership of TC 112. Suggestions under consideration include:

- Adding active links with more detail on membership on TC WGs.
- Link various TC maps. (As others become available, this connection will be attempted.)
- Add standards within one of the liaison TC/SC to the work of TC 112. Convey liaison relationship is more than annual summary reports.
- Add key words to help with searches.
- Add the direct link to the TC 112 GWP.

Conclusion

Mapping is indeed one more tool for communications. The interest and response to the first TC map has been encouraging. Since the release of the TC 112 map, IEC TC 125 released theirs and

others will hopefully soon be coming online. The purpose of the IEC Mapping platform is one more tool to assist in helping members.

Special thanks to:

This section gives the people who were critical to helping put the IEC TC 112 Map together.

- Johan SMIT, Chair of IEC TC 112
- Bernd KOMANSCHEK, Secretary of IEC TC 112
- Suzanne YAP GEOK SIM, IEC TO for IEC TC 112
- Christoph BOYER, TO and one of the developers of the IEC Mapping platform
- Vanesha RAJKOMAR, IEC Communications Coordinator – Graphic Designer

Interview with IECEE Chair Steven Margis

by Natalie Mouyal

Since January, Steven Margis has begun serving as the new Chair of IECEE, the IEC System for Conformity Assessment Schemes for Electrotechnical Equipment and Components. With a career in conformity assessment spanning over 30 years, he is well placed to lead the largest of the four IEC Conformity Assessment Systems.

IECEE is a multilateral certification system based on IEC International Standards. It offers testing and certification for the safety, performance and efficiency for 23 categories of electrical and electronic products, including medical devices. Since its establishment in 1985, IECEE has issued over 1,6 million certificates which, as Margis notes, "have had a substantial global impact."

Margis has been involved in conformity assessment since the onset of his career. After graduating from Marquette University, he joined UL in the United States. "When I started in conformity assessment, it was at a time when we were on the cusp of globalization. My job was to help manufacturers get their products to global markets. Given its role in facilitating global trade, I was soon involved with the IECEE," he explains.

Building expertise in conformity assessment takes time. As Margis notes, "I started working behind the scenes with the IECEE via experts within my organization before eventually joining working groups directly and now being a part of the leadership. It has been quite a journey."

The strengths of IECEE

According to Margis, the IECEE has a strong history of developing rules and procedures that ensure confidence in its resulting services. "These governance materials have been developed and approved by our national Member Bodies that consist of diverse stakeholder interests balanced between conformity assessment organizations and industry." While the strength of the IECEE is derived from the alignment between these interests, Margis points out that "it is further enhanced by additional stakeholders, such as regulators, who actively contribute to the objectives of the IECEE System."

In many countries, regulators are responsible for establishing technical, safety and quality requirements and monitoring compliance. "The IECEE provides a tool to help regulators achieve their objectives. We have examples across our 54 participating member countries who mutually recognize the deliverables of the IECEE System within their own national system and enable market access," remarks Margis. "And while the IECEE may not provide the end deliverable in some markets, it is a step towards our ultimate goal: one standard, one test, one conformity assessment certificate accepted everywhere."

Yet, there are challenges to achieve this goal. For example, infrastructures vary between countries as do regulatory regimes. "While IEC Standards provide a foundation to align basic safety requirements across the globe, the IECEE must consider what we refer to as 'national differences' that are additionally necessary to meet the technical requirements of various national systems as well as the associated trust and confidence requirements to meet local needs," notes Margis.

Nurturing the foundations

The IECEE System currently offers certification services to over 3 000 unique standards, including associated editions and amendments. "When we talk about change, we must consider that as a mature system, in 2021, despite the pandemic, over 100 standards - meaning editions, amendments and new standards - were published and introduced into the IECEE. Standardization is a key indicator of demand and a driver for services. Following this ever-changing standards environment serves us very well."

When considering his new role as IECEE Chair, Margis asserts that one of his most important objectives will be to nurture the foundation that has already been built. However, he says that this includes driving efficiencies for change. "Any change has to go in lockstep with our well-established foundational rules and procedures.

For example, we have opportunities to increase communication, reconsider the time cycles that we operate in, and identify opportunities and make decisions as close to on demand as possible within our given policies."

Entering new markets

While 173 countries participate in the work of the IEC as members and affiliates, not all are involved in the IECEE. According to Margis, "The biggest challenge is to bring additional IEC countries into the IECEE System that are not yet actively participating. However, doing so successfully requires engaging with local markets to ensure that they understand the value of the system and how it can contribute to their conformity assessment needs."

He also adds that it is essential to have dialogue with national stakeholders about their standardization requirements. "Standards are the backbone of the IEC and serve as a support system to help meet the confidence criteria of the marketplace and result in conformity assessment deliverables," he remarks.

Affiliate countries also offer opportunities to expand the IECEE community. "It is critical that we help these countries recognize how their participation and utilisation of IEC Standards provides value and helps to optimise conformity assessment resources in their community. However, without standards in place, the conformity assessment deliverables of the IECEE cannot follow. While there is more work that can be done, we can't rush the process. It is more about a journey that we can take together and hopefully better understand and address local market needs."

Promoting diversity and inclusiveness

According to Margis, diversity and inclusiveness are essential for the future of the IECEE. While diversity of geography is already top of mind, Margis stresses that "when we have critical conversations, they need to be inclusive of stakeholders across geographies and stakeholder groups. It is in our interest to be diverse so that we hear the full voice of our members. We encourage active participation across the IECEE to ensure these voices are heard."

"We are successful because of the active engagement and contributions of our members. As we see a turnover of experts across the community due to many factors, we need to consider how we will continue to maintain a high level of engagement from our members while providing opportunities to onboard and introduce the next wave of experts," Margis remarks.

Lessons learnt from the pandemic

During the pandemic, under the leadership of then IECEE Chair Wolfgang Niedziella, the IECEE was able to quickly react and ensure business continuity by implementing guidance related to the temporary utilization of remote assessments developed by experts from the IECEE's Peer Assessment Committee. As Margis notes, "The IECEE's ability to be nimble and utilize our experts has served us well and ensured the necessary level of confidence in our temporary approach to assessments."

Working across different time zones throughout the world has proved to be a challenge, not only for remote assessments, but for all ongoing work of the IECEE. Meeting times often required late nights for some participants and very early starts for others. According to Margis, "We have to be mindful of the consequences when we work in a web environment. We need to find creative ways to meaningfully communicate and advance work across time zones using tools like the IEC collaboration platform so that participants can contribute efficiently."

When considering the efforts made by experts during the pandemic, Margis concludes, "I want to recognize the extraordinary contributions of our international colleagues under significant time constraints during the pandemic period in working together to find ways to ease that burden for all our members."

Get the most of your ANSI membership with a free webinar!

ANSI encourages you to take the first step to see what you are missing, and, more importantly, to find areas where we can work effectively together. Find out why so many people value their membership in ANSI. Join in our upcoming webinar and ask us!

These interactive 30-minute webinars — held on the first Friday of each month and free of charge — are hosted live and provide an overview of ANSI's activities, as well as information on how to take full advantage of ANSI membership. A Q&A session encourages active dialogue between all participants.

For more details, visit our website!

USNC Members Shine with ANSI and IEC Awards

The USNC had the pleasure of presenting and celebrating several USNC members with their ANSI and IEC Awards at the May USNC Management Meetings in Fremont, CA. Please join us in congratulating the following USNC members for their outstanding contributions.

ANSI Leadership & Service Awards–USNC Winners (2021-2022)

Meritorious Service Award

» Ethan Biery

» Bob Sherwin

Next Generation Award

» Carolyn Hull

» Nathan Tom

President's Award for Journalism

» Elaina Finger

George S. Wham Leadership Medal

» Paris Stavrianidis

Thomson Electrotechnology Medal

» Tim Duffy

Finegan Standards Medal

» David Osborn

Howard Coonley Medal

» Sonya Bird

IEC Leadership & Service Awards–USNC Winners (2021)

1906 Awards

» Eldridge Byron

  » TC 17: High-voltage switchgear and control gear

» Neil Czarnecki

  » TC 121: Switchgear and controlgear and their assemblies for low voltage

» Peter Edmonds

  » TC 87: Ultrasonics

» George Gela

  » TC 78: Live Working

» Mitchell Guthrie

  » Convenor of WG18, AHG19, Expert in MT3, MT8, MT9

» James Halama

  » TC 62: Electrical equipment in medical practice

» Gregg Hardy

  » TC 100: Audio, video and multimedia systems and equipment

» Michael Johnson

  » TC 57: Power systems management and associated information exchange

» Jonathan Keller

  » TC 88: Wind energy generation systems

» Chad Kiger

  » TC 45: Nuclear instrumentation

» Patty Krantz-Zuppan

  » TC 62: Electrical equipment in medical practice

» Karl Lang

  » TC 110: Electronic displays

» Sergio Longoria

  » TC 77: Electromagnetic compatibility

» Paul Moliski

  » Co-Vice Chair of the USNC/IECEE

» Brian Polagye

  » TC 114: Marine energy - Wave, tidal and other water current converters

» Adam Pope

  » TC 59: Performance of household and similar electrical appliances

Pictured here from left to right: Mitchell Guthrie and Sonya Bird

- Ingrid Repins
  - TC 82: Solar photovoltaic energy systems
- John M. Roman
  - TC 106: Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure
- Nicholas Sands
  - TC 65: Industrial-process measurement, control and automation
- Veselin Skendzic
  - TC 38: Instrument Transformers
- Johannes Spinneken
  - TC 114: Marine energy - Wave, tidal and other water current converters
- Woody Strzelecki
  - TC 76: Optical radiation safety and laser equipment
- Tony Surtees
  - Convenor of MT3, Expert in MT9
- Edward Van Vooren
  - TC 112: Evaluation and qualification of electrical insulating materials and systems
- Yifei Zhang
  - TC 90: Superconductivity

UPCOMING EVENTS

Save the date! The USNC will host two trainings this September:

Monday, September 12
USNC TAG Leadership Workshop

Tuesday, September 13
IEC Procedures and Processes

These full-day workshops will be held in-person at the FM Approvals facilities in Norwood, MA. While in-person participation is encouraged, limited portions of the workshop will also be accessible virtually.

Keep an eye on your inbox for further information once registration opens!

USNC LINKEDIN

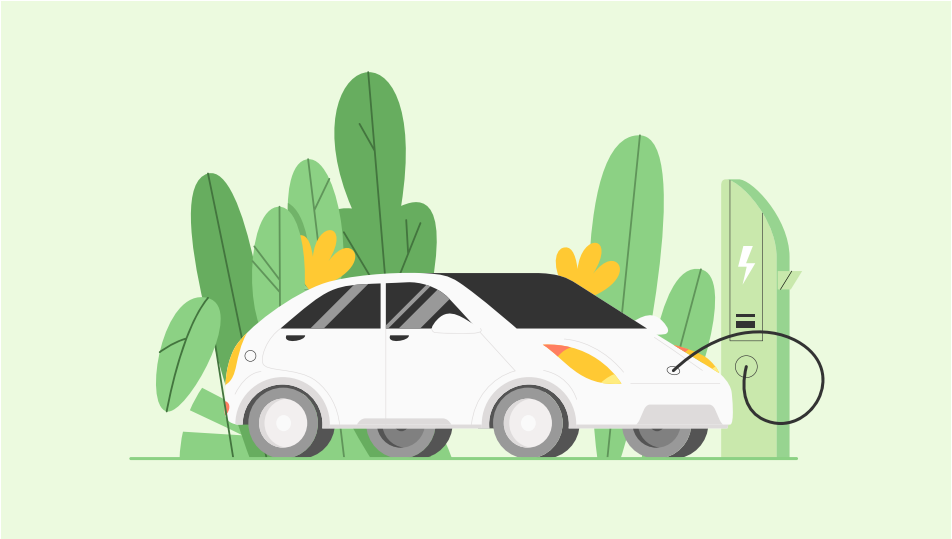
IEC United States National Committee of the IEC LinkedIn

Would you like to stay updated with the news and events of the USNC? Join our LinkedIn Group to learn about and provide input on all issues electrotechnical that can affect your life, from your own home to the other side of the globe! If you have any information to share on LinkedIn, please contact Megan Pahl (mpahl@ansi.org).

Calling All EV Stakeholders: ANSI to Develop Roadmap of Standards and Codes For Electric Vehicles at Scale

by Jim McCabe

The American National Standards Institute (ANSI) recently announced the launch of an initiative to develop a roadmap of standards and codes for electric vehicles (EVs) at scale. The ANSI Electric Vehicles Standards Panel (EVSP) will serve as the forum for development of the document.



In furtherance of the Biden Administration's goal for a clean energy future, the U.S. Department of Energy (DOE) Office of Energy Efficiency & Renewable Energy (EERE) Vehicle Technologies Office (VTO) issued a June 2021 lab call funding opportunity announcement. The lab call included a pillar on codes and standards with the goal to "identify and address challenges and barriers to the integration of EVs@Scale charging with the grid created by uncoordinated development of codes and standards and the rapid advances in vehicle and charging technologies." The EVs@Scale lab consortium formed in response committed to develop a 2022 roadmap like the earlier ANSI EV standards roadmap. Argonne National Laboratory (ANL) is the lead lab for the codes and standards pillar, supported by consortium members National Renewable Energy Laboratory (NREL), Oak Ridge National Laboratory (ORNL), Pacific Northwest National Laboratory (PNNL), Idaho National Laboratory (INL), and Sandia National Laboratories (SNL). The EV@Scale initiative supports federal and state funding associated with deploying EV charging infrastructure nationwide.

The priorities of the codes and standards effort will be to identify the most critical standards for EVs at scale, including for standards to address high-power DC charging, storage (i.e., microgrid, distributed energy resource management systems) integrated with DC charging, vehicle grid integration, high-power scalable/interoperable wireless charging, and vehicle-oriented systems. Subject-matter experts interested in participating are invited to review the panel architecture and sign up for one or more working groups. The working groups will hold virtual meetings, twice per month, over the course of the coming year. A draft roadmap is targeted for mid-February 2023, which will then undergo public review before being finalized by mid-May 2023. Participation is open to EV stakeholders that have operations in the United States.

The ANSI EVSP is a cross-sector coordinating body whose objective is to foster coordination and collaboration on standardization matters among public- and private-sector stakeholders to enable the safe, mass deployment of electric vehicles and associated infrastructure in the United States with international coordination, adaptability, and engagement. Outputs of the EVSP in the 2011-2014 timeframe included a *Standardization Roadmap for Electric Vehicles (Version 2.0, May 2013)*, a *Progress Report (November 2014)* against same, and a *Standards Compendium*. Though the priorities have shifted in many respects with the new focus on EVs@Scale, aspects of the earlier EVSP work may be drawn upon as needed.

ANSI's facilitation of this initiative is supported in part by VTO/Argonne National Laboratory. Additional, exclusive sponsorship opportunities with appropriate recognition benefits are invited from industry and other directly affected stakeholders to help offset ANSI's costs of operating the EVSP.

For more information, visit ANSI's EVSP webpage.

Call for Action and Participation in Standards!

CALL FOR MEMBERS – USNC TAG to IEC/PC 128

The USNC TAG Secretary for the USNC TAG to IEC/PC 128 - Operation of electrical installations would like to grow the membership of the TAG. Individuals who are interested in joining the USNC TAG to IEC/PC 128 are invited to contact Betty Barro at bbarro@ansi.org as soon as possible.

Please see the scope for IEC/PC 128 – Operation of electrical installations below:

Scope

Standardization in the field of broad (general) principles of operation of electrical installations. These operating instructions are intended to ensure that all operation of and work activity on, with, or near electrical installations can be carried out safely. These are electrical installations operating at voltage levels from and including extra-low voltage up to and including high voltage. These electrical installations are designed for the generation, transmission, conversion, distribution and use of electrical power. Some of these electrical installations are permanent and fixed, such as a distribution installation in a factory or office complex, others are temporary, such as on construction sites and others are mobile or capable of being moved either whilst energised or whilst not energised nor charged.

CALL FOR MEMBERS – USNC TAGs to IEC/TC 1 and IEC/TC 3, SC 3C, SC 3D

The USNC Technical Advisory Group (TAG) Secretary for the USNC TAGs to IEC/TC 1 and IEC/TC 3, SC 3C, SC 3D would like to grow the membership of the TAGs. Individuals who are interested in joining the USNC TAGs to IEC/TC1 and IEC/TC 3, SC 3C, SC 3D are invited to contact Betty Barro at bbarro@ansi.org as soon as possible.

Please see the scopes for IEC/TC 1 and IEC/TC 3, SC 3C, SC 3D below:

Scope TC 1 - Terminology

To sanction the terms and definitions used in the different electrotechnical fields and to determine the equivalence of the terms used in the different languages. As a consequence, to prepare an International Electrotechnical Vocabulary aiming at the standardization and coordination of the terms relating to electrical sciences and techniques for use in the technical language and literature, in teaching, in technical specifications and in commercial exchanges, and at giving their equivalents in the different languages.

Scope TC 3 - Documentation, graphical symbols and representations of technical information

Standardization in the field of documentation, graphical symbols and representations of technical information, covering

1. Rules, principles and methods focusing on machine sensible

representation of information. This includes but is not limited to:

- » definition and identification of classes and properties (e.g. sematic data),
- » ontologies and data dictionaries (e.g. CDD),
- » information models for structuring of technical data and document management, and
- » information exchange based on existing communication means.

It includes definition, co-ordination and management of the information required during the whole life cycle of a device, system, or plant, also covering aspects of documentation.

2. Rules, principles and methods focusing on human sensible representation of the information. This includes but is not limited to:
   - » presentation of information in documentation,
   - » graphical symbols for use in documentation,
   - » graphical symbols for the human interaction with equipment.

The standards deal with the presentations and graphical symbols as shown in documents or on equipment, independently of their forms of representation, analogue or digital, but may also include requirements for the development of documentation.

3. Rules, principles and methods for general and safety related marking, identification and arrangement of information in electrical installations, equipment and man-machine interfaces. This includes but is not limited to:
   - » the meanings of colours and alternative means, when used for marking and identification,
   - » the arrangement of indicating devices and actuators,
   - » coding principles for indicating and actuating devices,
   - » terminal designation of electrical and electronic components, apparatus and equipment,
   - » designation of certain designated conductors,
   - » marking of electrical and electronic equipment with ratings related to supply and to its properties,
   - » marking of bare and insulated conductors.

Scope SC 3C - Graphical symbols for use on equipment

Standardization in the field of graphical symbols for the human interaction with equipment regarding methods and rules.

Included:

- » Basic design rules for graphical symbols.
- » The design of graphical symbols for particular applications.

Graphical symbols for use on equipment are primarily intended to:

- » identify the equipment or a part of the equipment (e.g. a control or display);
- » indicate a functional state (e.g. on, off, alarm);
- » designate connections (e.g. terminals, filling points for materials);
- » provide information on packaging (e.g. identification of contents, instructions for handling);
- » provide instruction for the operation of the equipment (e.g. limitations of use).

Scope SC 3D - Classes, Properties and Identification of products - Common Data Dictionary (CDD)

Standardization for representation of technical information along the life cycle of a product including service, device, system or plant, covering rules, principles and methods associated with the machine sensible representation of the technical information. This refers to:

- » definition, structuring and identification of classes and properties
- » structural design of product data dictionaries and ontologies
- » consistent methodology for the purpose of structuring technical information and its exchange
- » support for the design of classes and properties in all domains/ industries and their publication in IEC Common Data Dictionary (IEC CDD)
- » maintenance and quality control of the IEC Common Data Dictionary (IEC CDD)

Supporting semantic interoperability

USNC TAG ADMINISTRATOR AND USNC TAG MEMBERS NEEDED

IEC approved one (1) new Committee: IEC Systems Committee (SyC) Sustainable Electrified Transportation (SET)

Individuals who are interested in becoming a USNC Technical Advisory

Group (TAG) Member or the USNC TAG Administrator for the USNC TAG to SyC Sustainable Electrified Transportation (SET) are invited to contact Betty Barro at bbarro@ansi.org as soon as possible.

Please see the scope for SyC SET below:

Scope

- Address systems level standardization in the area of sustainability of electric transportation.
- Offer wider opportunities to cope with this increasing market and the immense pace of upcoming changes around sustainable transportation.
- Help leverage the IEC and its visibility as a major contributor to the standardization in the transportation sector, which is witnessing an unprecedented electrification, while attracting cross sector top level experts to join the IEC work.

USNC TAG Administrator(s) – Organization Needed

NEMA is relinquishing its role as the USNC TAG Administrator for the USNC TAG to IEC/TC 77 SC77B SC77C CIS/A CIS/B CIS/H and CIS/I by September 1, 2022. The USNC is looking for a new organization(s) to take on this USNC TAG Administratorship(s).

Please note that according to the rules and procedures of the USNC, a USNC TAG cannot exist without a USNC TAG Administrator. If we cannot find a new USNC TAG Administrator, the USNC will have to withdraw from international participation and register with the IEC as a Non-Member of this Committee.

If an organization is interested in the position of USNC TAG Administrator for the USNC TAG to IEC/TC 77; SC77B; SC77C; CIS/A; CIS/B; CIS/H and CIS/I, they are invited to contact Betty Barro at bbarro@ansi.org as soon as possible.

Please see the scopes for the IEC/TC 77; SC77B; SC77C; CIS/A; CIS/B; CIS/H and CIS/I below:

Scope: TC 77 - Electromagnetic compatibility

Standardization

- to prepare standards and technical reports
- in the field of electromagnetic compatibility (EMC), with particular emphasis on general application and use by product committees. (Horizontal function).

The scope covers the following aspects of EMC:

- Immunity and related items, over the whole frequency range: basic and generic standards,
- emission in the low frequency range (f <= 9 kHz, e.g. harmonics and voltage fluctuations): basic, generic and product (family) standards,
- emission in the high frequency range (f > 9 kHz): disturbances not covered by CISPR 10 (1992), in co-ordination with CISPR (e.g. mains signalling).

Product immunity standards are not included. However, at the request of product committees, TC 77 may also prepare such standards under the co-ordination of ACEC.

Horizontal Safety Function: Electromagnetic compatibility in so far as safety aspects are involved.

Scope: SC 77B - High frequency phenomena

Standardization in the field of electromagnetic compatibility with regard to high frequency continuous and transient phenomena (ca > 9 kHz, see Note).

Note: This limit frequency can be adapted toward a lower or higher frequency according to the phenomena or equipment.

Scope: SC 77C - High power transient phenomena

"Standardization in the field of electromagnetic compatibility to protect equipment, systems and installations from intense but infrequent high power transient phenomena including: the electromagnetic fields produced by nuclear detonations at high altitude (High Altitude Electromagnetic Pulse (HEMP)); sources of Intentional Electromagnetic Interference (EMI); and Geomagnetically Induced Currents (GIC) from solar activity.

Lightning and other transient phenomena are excluded from the scope of SC 77C."

Scope: CIS/A - Radio-Interference Measurements and Statistical Methods

Standardization of:

- measuring instruments, ancillary apparatus and test sites;
- measuring methods common to several applications;
  - Note: The method of connection, arrangement and use of equipment for the measurement of a particular source of disturbance is primarily the responsibility of the subcommittee dealing with that source, but liaison is maintained with Subcommittee A to achieve the maximum coordination.
- treatment of uncertainties in CISPR compliance tests
- sampling methods used in statistical interpretation of

disturbance measurement results and used in correlating the measurement of disturbance with its effect on signal reception; for publication in CISPR basic EMC standards and related technical reports. Evaluation of proposals for methods of measurement developed by other CISPR subcommittees, and consideration of those proposals for publication in CISPR basic or product standards.

Scope: CIS/B - Interference relating to industrial scientific, and medical radio-frequency apparatus, to other (heavy) industrial equipment, to overhead power lines, to high voltage equipment and to electrical traction

Standardization in the field of limits and particular methods of measurement for control of radio frequency disturbances from industrial, scientific and medical electrical equipment also including particular industrial, scientific and medical ISM RF equipment as defined in the ITU Radio Regulations. The scope of activities in CISPR SC B comprises, but is not limited to the following typical types of products:

General purpose applications

- Laboratory equipment
- Medical electrical equipment
- Scientific equipment
- Semiconductor-converters
- Industrial electroheating equipment with operating frequencies less than or equal to 9 kHz
- Machine tools
- Industrial process measurement and control equipment
- Semiconductor manufacturing equipment

ISM RF applications

- Microwave-powered UV irradiating apparatus
- Microwave lighting apparatus
- Industrial induction heating equipment operating at frequencies above 9 kHz
- Induction cookers
- Dielectric heating equipment
- Industrial microwave heating equipment
- Microwave ovens
- Medical electrical equipment
- Electric welding equipment
- Electro-discharge machining (EDM) equipment
- Demonstration models for education and training

Standardization in the field of limits and measuring methods for evaluation of radio frequency disturbances from high-voltage overhead power lines inclusive electric traction of railways and urban transport, and from high voltage alternate current (AC) substations and direct current (DC) converter stations.

Scope: CIS/H - Limits for the protection of radio services

Standardization in the field of identification of generic-type limits and methods of measurement for the assessment and control of radio frequency disturbances from any kind of electrical or electronic appliance intended for operation and use in a given electromagnetic environment, and incorporation of these requirements in the respective CISPR Generic Emission Standards.

Standardization in the field of CISPR coupling and disturbance models for determination of emission limits for the protection of radio services taking into account the needs of Product Committees.

Maintenance for the database for the characteristics of radio services.

Evaluation of proposals for limits for control of radio frequency disturbances developed by subcommittees of CISPR and review for their inclusion in CISPR Product Standards.

Scope: CIS/I - Electromagnetic compatibility of information technology equipment, multi-media equipment and receivers

Standardization in the field of EMC to establish limits and particular methods of measurement for the control of radio frequency disturbances from immunity of Multimedia Equipment including Information Technology Equipment , Radio and TV Broadcast Receivers and Associated Equipment.

The radio transmission aspects of MME transceivers and transmitters are excluded from the work of CISPR/I and are activities handled by other international standards organizations such as ITU-R.

USNC TAG Administrator – Organization Needed

NEMA is relinquishing its role as the USNC TAG Administrator for the USNC TAG to IEC/TC 96. The USNC is looking for a new organization to take on this USNC TAG Administratorship.

Please note that according to the rules and procedures of the USNC, a USNC TAG cannot exist without a USNC TAG Administrator. If we cannot find a new USNC TAG Administrator, the USNC will have to withdraw from international participation and register with the IEC as a Non-Member of this Committee.

If an organization is interested in the position of USNC TAG Administrator for the USNC TAG to IEC/TC 96, they are invited to contact Betty Barro at bbarro@ansi.org.

Please see the scopes for IEC/ TC 96 below:

Scope: TC 96 - Transformers, reactors, power supply units, and combinations thereof

Standardization in the field of safety, EMC, EMF, energy efficiency and environmental aspects of transformers, reactors, power supply units, and combinations thereof. The standardization does not cover transformers, reactors and power supply units intended to be a part of distribution networks (covered by TC 14).

TC 96 has group safety function in accordance with IEC Guide 104 for transformers other than those intended to supply distribution networks, in particular transformers and power supply units intended to allow the application of protective measures against electric shock as defined by TC 64, with no limitation of rated output power, but in certain cases including limitation of voltage.

The general limitations for voltages are:

- rated supply voltage not exceeding 1 000 V a.c.;
- rated output voltage not exceeding 1 000 V a.c. or 1 500 V ripple free d.c.; however, internal voltages may exceed 1 000 V a.c. or 1 500 V ripple free d.c. For high-voltage applications, other than distribution networks (covered by TC 14), the rated output voltage can exceed 1 000 V a.c. or 1 500 V ripple free d.c. but the no load output voltage shall not exceed 15 000 V a.c. or 15 000 V d.c.

The general limitations for the rated output are:

- The maximum rated output depends on the type of transformer or linear power supply unit does in most cases not exceed 25 kVA for single-phase products and 40 kVA for three phase products;
- the maximum rated output does not exceed 1 kVA for both single-phase and three phase Switch Mode Power Supplies;
- the general limitations for the rated core power are 25 kVA for single-phase auto transformers and 40 kVA for three phase auto transformers;
- the general limitations for the rated power are 50 kvar for single-phase reactors and 80 kvar for three phase reactors. For special transformers, reactors and power supply units and combinations thereof there are no limitation of rated output, rated core power and rated power.

USNC Names Participants for 2022 IEC Young Professionals Workshop

by USNC Staff

The U.S. National Committee (USNC) of the International Electrotechnical Commission (IEC) congratulates the U.S. winners of its 2022 Young Professionals Workshop Competition. Recipients will participate in the international workshop on October 31-November 4, in San Francisco, California, in conjunction with the 86th IEC General Meeting (GM).

The in-depth, five-day workshop will bring together young professionals from around the world who are at the beginning of their careers in electrotechnical standardization and conformity assessment, and who have been selected and recognized by their IEC National Committees.

This year, the USNC received excellent applications reflecting a number of well-qualified candidates. As with previous years, the 2022 winners were selected based on their demonstrated dedication in connection with standardization and/or conformity assessment activities; their vision of the larger commercial and strategic impact of standards and conformance work; and their accomplishments in their chosen field of activity.

The USNC represents U.S. interests in IEC standards and conformance activities, and is an integrated committee of the American National Standards Institute (ANSI). The workshop is intended to cultivate long- term national involvement in the international arena, strengthen technology transfer, and encourage the participation of emerging professionals in shaping the future of these areas.

The USNC has named the following four IEC Young Professionals:

- Grace Callahan (UL Standards & Engagement)
- Amanda Johnson (Festool USA)
- Eric Jonardi (Rockwell Automation)
- Allison Managlia (Intel Corporation)

"Once again we were thrilled to have such an outstanding lineup of professionals this year," said Tony Zertuche, ANSI director, international policy, and general secretary of the USNC/IEC. "On behalf of the USNC, I am pleased and delighted to announce that these top achievers have been selected to participate in the IEC Young Professionals 2022 Workshop."

ABOUT THIS PUBLICATION

The USNC Current newsletter is distributed to the constituency of the U.S. National Committee (USNC) of the International Electrotechnical Commission (IEC). It provides updates on technical activities and other information of interest to members of the electrotechnical community. Some articles are reprinted with permission from the IEC News log.

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