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WHAT'S NEW AT THE IEC?

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WHAT'S NEW AT THE IEC?

FEATURED STORIES

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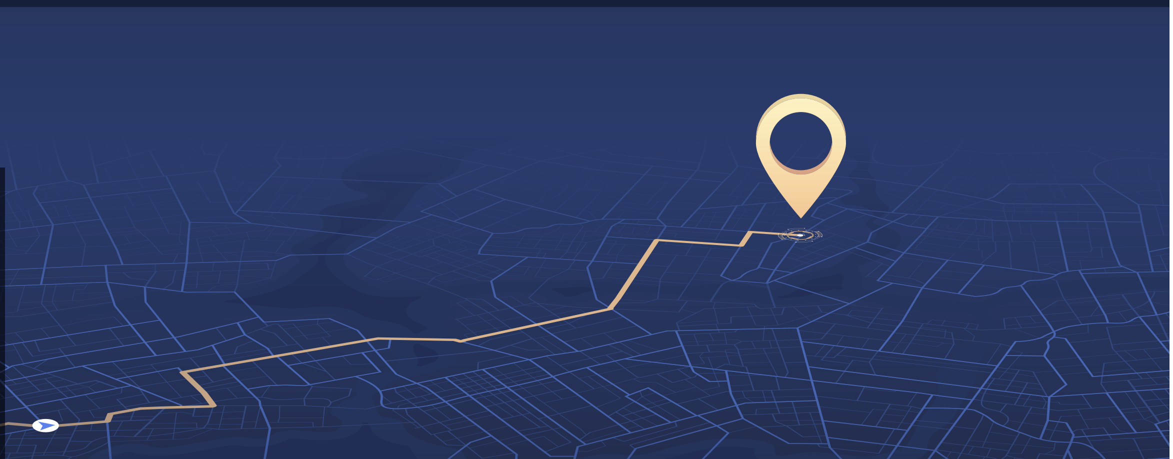
DEVELOPING A FUTURE ROADMAP: PREPARING FOR TOMORROW'S STANDARDS LANDSCAPE

Megan Hayes – Vice President, Standards and Technical Affairs, NEMA; USNC Council Member



This article is part of a series explaining the importance of the USNC Strategic Objectives.

The United States National Committee (USNC) of the IEC has long recognized that the pace of technological change demands proactive planning. The "Develop Future Roadmap" strategic objective focuses on anticipating market disruptions, regulatory shifts, and evolving stakeholder needs to ensure U.S. leadership in international electrotechnical standardization. This is not just about reacting to change—it's about shaping it.

WHY IT MATTERS

Global standardization is increasingly influenced by emerging technologies such as AI, advanced manufacturing, and grid modernization. Without a forward-looking roadmap, the U.S. risks falling behind in areas critical to competitiveness and safety. A robust roadmap enables the USNC to:

- **Forecast Disruptions:** Identify technologies and trends that could redefine industry practices.
- **Align Resources:** Direct expertise and funding toward priority areas.
- **Strengthen Influence:** Position U.S. stakeholders to lead IEC initiatives rather than follow.

CURRENT EFFORTS AND INITIATIVES

Several initiatives are already underway to operationalize this objective:

- **Hot Topics Radar Group:** Recently established to monitor emerging issues and flag areas requiring early engagement. This group helps ensure that U.S. experts are aware of—and prepared for—new IEC work items before they gain momentum internationally.
- **Performance Dashboard Proposal:** Under discussion by the USNC Finance Committee, this tool would track progress against strategic objectives, highlight risks, and measure impact. By linking roadmap priorities to performance indicators, USNC can maintain accountability and transparency.

- **Integration with Industry Roadmaps:** Collaboration with organizations like NEMA ensures alignment between USNC priorities and broader U.S. technology strategies. For example, advanced manufacturing and smart grid initiatives are being mapped to IEC committees to maximize U.S. participation.
- **Leadership Development:** Preparing future leaders is integral to sustaining roadmap execution. Structured training programs and mentorship models are being explored to ensure continuity and readiness for emerging challenges.

LOOKING AHEAD

The roadmap is not static—it will evolve as technologies and markets change. Key next steps include:

- Formalizing a risk and opportunity assessment framework for new IEC projects.
- Expanding stakeholder engagement through webinars and targeted outreach.
- Leveraging data analytics to identify gaps in U.S. representation and influence.

By committing to this forward-thinking approach, the USNC ensures that the U.S. remains a global leader in electrotechnical standardization—driving innovation, safety, and interoperability for decades to come.

JOIN US AT THESE UPCOMING EVENTS!

The inaugural ANAB Conformity Assessment Symposium brings together leaders and professionals from industry, government, and conformity assessment on January 19–20, 2026, at the Gaylord Palms Resort in Orlando. Optional professional development training available. Click here to register for the event.

ANSI will host an in-person conference focused on global standardization challenges and enhancing U.S. industry leadership in global standards on March 24–25, 2026, in Scottsdale, Arizona.

Through these strategic discussions, ANSI aims to bolster U.S. competitiveness in critical and emerging technologies while identifying pathways for the U.S. to expand its influence at both governance and technical levels within key international bodies, including the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC).

LOOKING FOR STANDARDS?

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IECRE & IEC TC 114 ANNOUNCEMENTS

USNC TAG to IEC TC 114

Mr. Jonathan Colby to lead the IECRE as Chair and receives the American National Standards Institute's Gerald H. Ritterbusch Conformity Assessment Medal.

Mr. Gabriel Alsenas to succeed Mr. Colby as Chair of IEC Technical Committee (TC) 114 and is elected to serve a third term as Treasurer of the IECRE.

The USNC Technical Advisory Group (TAG) to IEC TC 114 is pleased to announce that the IEC's Conformity Assessment Board has affirmed that, beginning January 1, 2026, Mr. Jonathan Colby will begin serving as Chair of the Renewable Energy Management Committee (REMC) of the IEC Renewable Energy (IECRE) conformity assessment system. The REMC is the decision-making committee of the IECRE which considers proposals from all IECRE committees including the Marine Energy Sector Working Group (ME-SWG), the Wind Energy Sector Working Group (WE-SWG), and the Photo Voltaic Sector Working Group (PV-SWG).

Prior to Mr. Colby's appointment as Chair of the REMC, he served as Chair of IEC TC114 and as Convenor of the IECRE ME-SWG.

The TAG is also pleased to announce that Mr. Gabriel Alsenas has been elected to succeed Mr. Colby as Chair of IEC TC 114 for an initial six-year term beginning November 1, 2025. Mr. Colby will support Mr. Alsenas as Vice-Chair during a brief management transition period. In addition, Mr. Alsenas was elected to serve a third and final one-year term as Treasurer of the IECRE conformity assessment system where he has ably managed the transition of the system to profitability following its establishment in 2014.

Lastly, the TAG is pleased to announce that Mr. Colby was awarded the American National Standards Institute's (ANSI) Gerald H. Ritterbusch Conformity Assessment Medal which honors distinguished service in promoting the understanding and application of conformity assessment methods as a means of providing the marketplace with confidence in standards compliance.

About: The USNC Technical Advisory Group to IEC TC 114 manages the U.S. Shadow Committee which comprises over 80 subject matter experts who participate in the development of international standards for the marine energy sector. The TAG is supported by the National Renewable Energy Laboratory (NREL) and its activities are funded by the DOE's Water Power Technologies Office (WPTO).

JUST PUBLISHED

Check out the latest and greatest recently published standards by the IEC. A complete list of recently published documents can be found here. Here's just one (of many!) we think you'll find interesting:

IEC 60092-352:2025- ELECTRICAL INSTALLATIONS IN SHIPS - PART 352: SELECTION, INSTALLATION, AND OPERATING CONDITIONS OF CABLES

IEC 60092-352:2025 provides the basic requirements for the selection, installation and operating conditions of electrical cables intended for fixed electrical systems on board ships at voltages (U) up to and including Um 18/30 (36) kV, symmetrical category cables and fibre optic cables.

The reference to fixed systems includes those that are subjected to vibration (due to the movement of the ship) or movement (due to motion of the ship) and not to those that are intended for frequent flexing.

Cables subject to frequent or continual flexing use, which can withstand the mechanical stress and the environment they are exposed to, are detailed in other IEC specifications such as IEC 60227 and IEC 60245. Flexible cables are frequently used for retractable thrusters, elevators, moving decks, cranes, shore connections and other moving applications on board ships.

This fourth edition cancels and replaces the third edition published in 2005. This edition constitutes a technical revision.

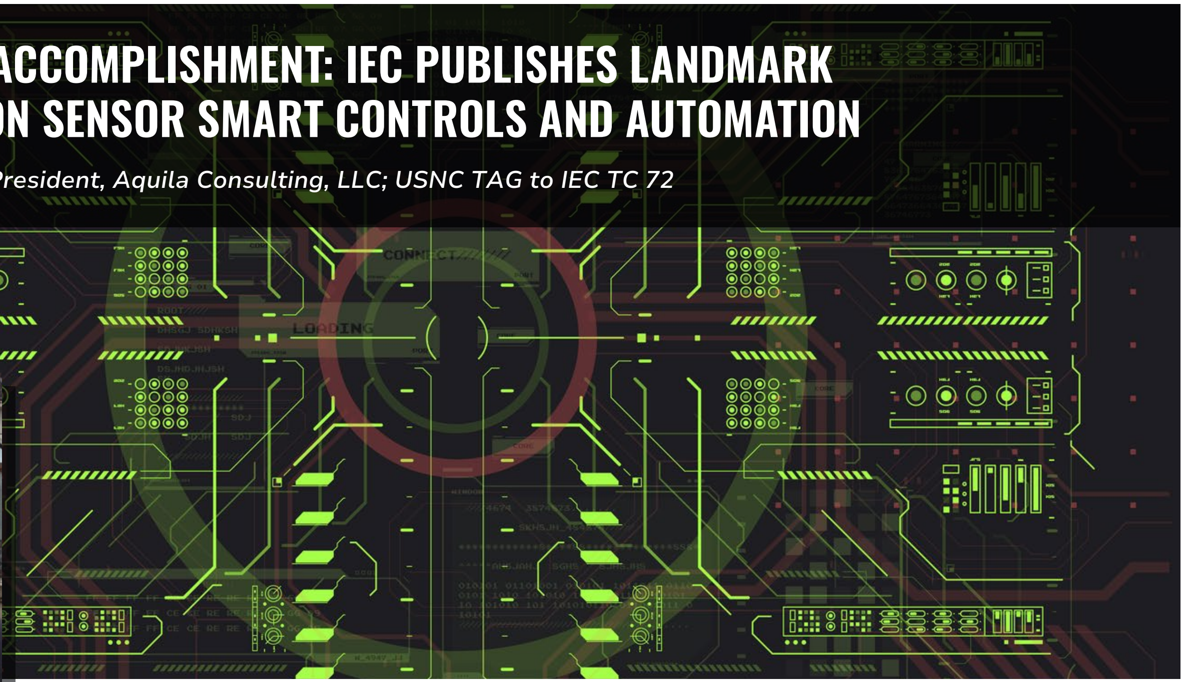
This edition includes the following significant technical changes with respect to the previous edition:

- Modification of the part title;
- Complete review of the document and establishment of the match with all other standards from the group IEC 60092-350 to IEC 60092-379;
- Addition of terms and definitions;
- Addition of technical requirements for the installation of symmetrical category cables with transmission characteristics up to 1 000 MHz;
- Addition of the technical requirements for the installation of fibre optic cables;
- Addition of technical requirements for the installation of cables for installation between areas with and without explosive atmospheres

Developed by TC 18/SC 18A Electric cables for ships and mobile and fixed offshore units

A SENSE OF ACCOMPLISHMENT: IEC PUBLISHES LANDMARK STANDARD ON SENSOR SMART CONTROLS AND AUTOMATION

David Delaquila – President, Aquila Consulting, LLC; USNC TAG to IEC TC 72



Some achievements arrive with fanfare. Others arrive with quiet precision after years of detailed work, global collaboration, and technical perseverance. The International Electrotechnical Commission (IEC) Technical Committee 72 (IEC/TC 72), *Automatic electrical controls,* is proud to announce the publication of a landmark standard: IEC 60730-2-23:2025 – *Particular requirements for electrical sensors and sensing elements.*

For TC 72, this is an exciting moment and the culmination of a long-protracted effort that has resulted in a first-of-its-kind standard. This first edition marks a significant step forward in ensuring the safety, reliability, and performance for one of the most foundational technologies in modern smart control systems and automation—the electrical sensor.

Developed by IEC/TC 72/WG 12, this new standard has been years in the making, refined over multiple drafts and shaped by input from international experts. It addresses a growing need within the controls industry. Until now, there was no dedicated standard to support these devices within the IEC standards framework—IEC 60730-2-23 changes that.

THEY'RE INVISIBLE BUT PLAY AN ESSENTIAL ROLE

It's easy to overlook them—they're tiny, they're often hidden from view, and they're everywhere. Embedded deep inside control technology that we use every day, sensors are the unsung heroes of the modern world, quickly becoming the nervous system of emerging smart technology. Sensors form the initiating component of a control loop in an intelligent automated system; therefore, it plays a pivotal role in the performance and accuracy of the controlled function.

Control technology surrounds us in ways most people rarely notice. In our homes, sensors are in the thermostat that automatically adjusts the temperature, the washing machine that senses load size, the refrigerator that monitors internal humidity, and the smoke or carbon monoxide alarm that silently stands guard. In our vehicles, sensors are used in control systems that govern everything from adaptive cruise control to tire pressure monitoring and collision avoidance. In workplaces and public spaces, sensors regulate lighting based on occupancy, manage HVAC systems for comfort and efficiency, and monitor environmental conditions for safety. Even personal devices—smartphones, wearables, laptops—are loaded with sensors that adjust screens, track movement, and detect touch with near-instant responsiveness.

Once limited to industrial labs and niche electronics, sensors now permeate our daily lives, embedded in virtually every smart application—from whole home and building automation systems to personal electronics, to the car you drive. These miniature control system components collect, analyze, and process critical environmental data, transforming it into a usable output signal that allows the control system to execute its intended function.

Until recently, there was no dedicated international standard governing the accuracy and reliability of these sensors within control systems. That created a conformity assessment gray area—one that this new standard seeks to resolve.

TRENDS & GROWTH IN SENSOR USE

The rise of sensors is nothing short of explosive—fueled by the transition of electromechanical systems to smart electronic systems using state-of-the-art technologies such as IoT, AI, MEMS, etc., in autonomous systems, and smart infrastructure:

» In 2023 alone, the global smart sensors market was valued at around USD 64.6 billion, and in terms of the compound annual growth rate (CAGR) it is projected to rise to USD 263.6 billion by 2032, registering a robust CAGR of ~17% (Fortune Business Insights).

» More optimistic forecasts estimate the market could reach between USD 290.5 billion by 2032 (CAGR ~17.8%) (Credence Research), or even, forecasting a CAGR of 19.2% (Future Market Insights).

» Underpinning this growth is the soaring number of connected “smart” devices. Over 20.5 billion IoT devices were active in 2024—a 17% increase from 2023 (Market Growth Reports).

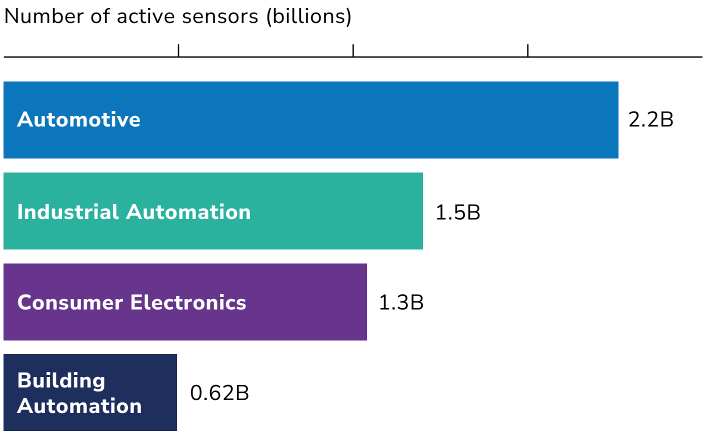
» Globally, 16.6 billion IoT connections were recorded in 2023, with projections expecting 30 billion by 2025 (Wikipedia).

» Breakdown by sector in 2024 reveals staggering sensor deployment:

- 2.2 billion in automotive (ADAS, batteries, cabin monitoring);
- 1.5 billion in industrial automation (predictive maintenance, robotics);
- 1.3 billion in consumer electronics (smartphones, wearables);
- 620 million in building automation (HVAC, occupancy, energy) (Market Growth Reports).

Meanwhile, transformative trends are reshaping how sensors function and integrate: AI-driven data analysis for real-time decision-making, miniaturization enabling embedding in wearables and mobile devices, and the rise of contactless sensing powered by health and hygiene demands (Cons&Insights).

Global Sensor Deployment by Sector (2024)



The following graph highlights the current state of global sensors by sector.

WHAT THE STANDARD COVERS

At its core, the standard applies to the safety of the component and the efficacy of its function with respect to functional safety. It covers electrical, electromechanical, and electronic sensors, including both the sensing elements and any built-in conditioning circuits that transform the activating quantity such as temperature, humidity, pressure, etc., into a usable output signal. It currently covers sensors that use sensing elements made of semi-conductor material and pure metal; however, it is the intent to expand the scope to cover other technologies such as MEMS, optical, sound, etc.

What's important here is that sensors don't trigger control actions themselves—they only provide the usable signal that informs the system to perform its intended function. That's what differentiates this standard from existing ones under IEC 60730, which governs the complete control system operation.

The standard ensures that these components perform safely, reliably and accurately under normal and abnormal or adverse conditions, and that any embedded electronics (including software) deliver a dependable output signal. The efficacy and robustness of the sensing element is determined by subjecting it to various environmental stresses such as temperature & humidity variations, electrical & mechanical stresses and other electromagnetic disturbances to simulate "real time" stresses during its useful operating life. These stresses are based on the technology used in the sensing elements of the sensor. It's a behind-the-scenes safety net for devices we often take for granted.

SO, WHAT HAPPENS IF SENSORS FAIL?

Sensors are the "eyes" and "ears" of a control system employed in an appliance or equipment. While sensors are small, the consequences of their failure can be large—and sometimes dangerous. Potential outcomes include:

» **False readings leading to unsafe conditions:** A faulty CO_2 or NO_2 sensor in an HVAC system could fail to detect dangerous indoor air quality, exposing occupants to harmful gases.

» **Equipment damage:** An inaccurate temperature sensor in an industrial oven might cause overheating, damaging products or creating fire hazards.

» **System shutdowns:** A pressure sensor failure in an industrial boiler system could trigger unnecessary shutdowns, halting production and causing costly downtime.

» **Safety system failure:** A misreading from a proximity sensor in an autonomous vehicle could fail to detect an obstacle, risking collision.

» **Energy waste:** Faulty occupancy sensors in building lighting control might leave lights running 24/7, increasing energy costs.

» **Public health risks:** In medical devices, inaccurate readings from a blood pressure or oxygen sensor can lead to improper treatment decisions.

These examples underscore why accuracy, reliability, and safety testing—as defined in IEC 60730-2-23—are critical. When a sensor fails, it's not just the component that's at risk—it's the entire system, the user, and sometimes public safety.

WHAT ABOUT CONFORMITY ASSESSMENT? WHERE DOES IEC 60730-2-23 FIT?

While IEC 60730-2-23 sets crucial safety and performance criteria for sensors, how it connects with formal conformity assessment systems like IECEE is important to understand:

» The IECEE (IEC System for Conformity Assessment Schemes for Electrotechnical Equipment and Components) oversees the widely recognized CB

Scheme, enabling the exchange of data from one CB test laboratory to another enabling multilateral test certificate recognition across global markets.

» All parts of the IEC 60730 series, including the part 1 standard are under the scope of the CB Scheme under the product category. Each standard has associated Test Report Forms (TRFs) under IECEE VSQI that are used by each CB test laboratory for the exchange of data.

» Since IEC 60730-2-23:2025 is now recently published, it is not under the scope of the category of the CB Scheme. However, when a national document is harmonized to this part 2 standard, steps will be taken to place IEC 60730-2-23 under the CB Scheme, similar to the other part 2 standards of the series.

» That said, the IECEE has recently introduced new programs:

- The Component Certification Program (CCP), which allows components or sub-assemblies (like sensors) to gain an independent IECEE Component Certificate of Conformity (CCC).
- The Aspect Certification Program (ACP), focusing on specific aspects of a standard—e.g., embedded software packages or EMC concerns.

These new frameworks will facilitate future inclusion of IEC 60730-2-23 under IECEE conformity tools, giving sensor manufacturers a pathway to participate in IECEE certification programs at the component level.

ARE THERE PARTICIPATION PATHS FOR MANUFACTURERS UNDER IECEE?

Although IEC 60730-2-23 is newly published and not yet listed in the IECEE's website there are several ways sensor manufacturers can position themselves now — and be ready when it is officially included.

EARLY ENGAGEMENT WITH IECEE NATIONAL CERTIFICATION BODIES (NCBS)

» Manufacturers can initiate discussions with their local NCBs to understand readiness timelines for adopting IEC 60730-2-23.

» Early engagement may allow pre-assessment testing to IEC 60730-2-23, so once the standard is formally in scope, certification is a faster step.

» This also helps align test plans and product design decisions with anticipated IECEE requirements.

LEVERAGE THE IECEE COMPONENT CERTIFICATION PROGRAM (CCP)

» CCP allows standalone component certification for devices like electrical sensors.

» Even without formal CB Scheme TRF availability, CCP certificates can be recognized by multiple markets, easing integration into certified end products.

» Manufacturers can promote their CCP-certified sensors to system integrators as "ready for CB-compliant integration."

CONSIDER THE IECEE ASPECT CERTIFICATION PROGRAM (ACP)

» ACP focuses on specific safety or performance aspects — for example, software reliability, EMC resilience, or environmental stress tolerance.

» For complex sensors with embedded microcontrollers and firmware, ACP can certify compliance with these aspects in advance of full CB Scheme recognition.

PRE-CERTIFICATION THROUGH IECEE RECOGNIZED TESTING LABORATORIES (CBTLS)

» Many CBTLs already have the equipment and competence to test sensors to IEC 60730-2-x standards.

» A pre-certification test report from a CBTL can be used as supporting evidence when submitting for CB Scheme or CCP certification later.

INTEGRATION INTO END-PRODUCT CB SCHEME CERTIFICATION (I.E., CB MARK)

- Even before IEC 60730-2-23 is in scope, a sensor's compliance to the standard can be declared and documented in the CB test report of the end product (e.g., a thermostat, appliance, HVAC controller).
- This offers a marketing advantage, signaling proactive compliance to customers and regulators.

WHY MANUFACTURERS SHOULD ACT NOW

- **Market advantage:** Early adopters can brand products as "listed to IEC 60730-2-23," signaling quality and safety leadership.
- **Reduced time to market:** Pre-tested sensors integrate more smoothly into certified systems.
- **Global market readiness:** When the standard enters the CB Scheme scope, early testers are positioned for immediate certification.

As sensors become more embedded, more critical, and more complex, having a dedicated standard is not just beneficial—it's essential. IEC 60730-2-23 provides a global benchmark that recognizes their central role. While good technology may be invisible, its impact is anything but.

BEYOND THE FINISH LINE: LOOKING FORWARD AND EXPANDING OUR EXPERTISE

The first edition is only the beginning. Future updates may extend to new sensor types—chemical, mechanical, MEMS-based—and new detectable quantities such as mass flow, vibration, and weight. Here is where you might find these devices in everyday life and why it's important.

CHEMICAL SENSORS

- **Air Quality Monitoring:** Detecting pollutants or toxic gases (e.g., CO, NOx, VOCs) in HVAC systems to improve indoor air quality.
- **Water Quality Control:** Sensing pH, chlorine, or contaminants in water treatment or smart plumbing systems.
- **Food Safety:** Detecting spoilage or contamination in food storage and processing equipment.
- **Industrial Process Control:** Monitoring chemical concentrations in manufacturing processes, e.g., solvents, acids, or gases.

Use Case Example:

In smart HVAC systems, chemical sensors detect indoor air pollutants such as carbon monoxide (CO) or volatile organic compounds (VOCs). When pollutant levels exceed safe thresholds, the control system increases ventilation or triggers alarms to protect occupants.

Safety Considerations:

- Sensor accuracy and stability over time to prevent false alarms or missed detections.
- Resistance to environmental factors like humidity and temperature that may affect chemical sensor response.
- Fail-safe mechanisms if sensor readings are lost or erratic to avoid unsafe air quality conditions.

MECHANICAL SENSORS

- **Pressure Sensors:** Used in HVAC systems, boilers, and industrial equipment to monitor pressure and trigger safety controls.
- **Flow Sensors:** Measuring fluid or gas flow rates in heating, ventilation, and air conditioning or industrial processes.
- **Vibration Sensors:** Monitoring mechanical equipment health or fault detection in motors and pumps.
- **Position and Displacement Sensors:** Used in actuators or automatic valves controlling mechanical movement.

Use Case Example:

Pressure sensors in gas boilers monitor combustion chamber pressure. If pressure rises beyond safe limits, the control automatically shuts down the burner to prevent explosion hazards.

Safety Considerations:

» Calibration and drift testing to ensure reliable pressure measurements.

» Robustness against vibration, shock, and mechanical wear during operation.

» Clear fault detection and response protocols to safely handle sensor failures.

MEMS-BASED SENSORS (MICRO-ELECTRO-MECHANICAL SYSTEMS)

» **Accelerometers & Gyroscopes:** For smart appliances that adjust operation based on orientation or motion (e.g., washing machines adjusting spin cycles).

» **Micro-Pressure Sensors:** In medical devices or compact HVAC controls for precise environmental monitoring.

» **Gas Sensors:** Compact MEMS gas sensors for detecting combustible gases or volatile organic compounds in home safety devices.

» **Flow Sensors:** MEMS-based microfluidic flow sensors in laboratory equipment or advanced cooling systems.

Use Case Example:

A MEMS accelerometer in a washing machine detects imbalance during spin cycles. The control adjusts drum speed or pauses operation to avoid excessive vibration that could damage the machine or surrounding environment.

Safety Considerations:

» Verification of sensor sensitivity and threshold settings to prevent nuisance stops or unsafe operation.

» Protection from electromagnetic interference that could affect MEMS sensor signals.

» Ensuring sensor data integrity and timely communication with the control system for immediate response.

AN ACHIEVEMENT WITH IMPACT

In summary, expanding IEC 60730-2-23 to include these sensors would allow better standardization and safety assurance for a wider range of smart and automated controls—from environmental monitoring and industrial automation to consumer appliances and medical devices.

This isn't just a "fill-in-the-gap" undertaking—it's a technical achievement with wide-reaching benefits. It enables clearer certification paths and more efficient design processes for manufacturers and system integrators alike.

GET INVOLVED

Do you design, manufacture, or work with sensor technologies?

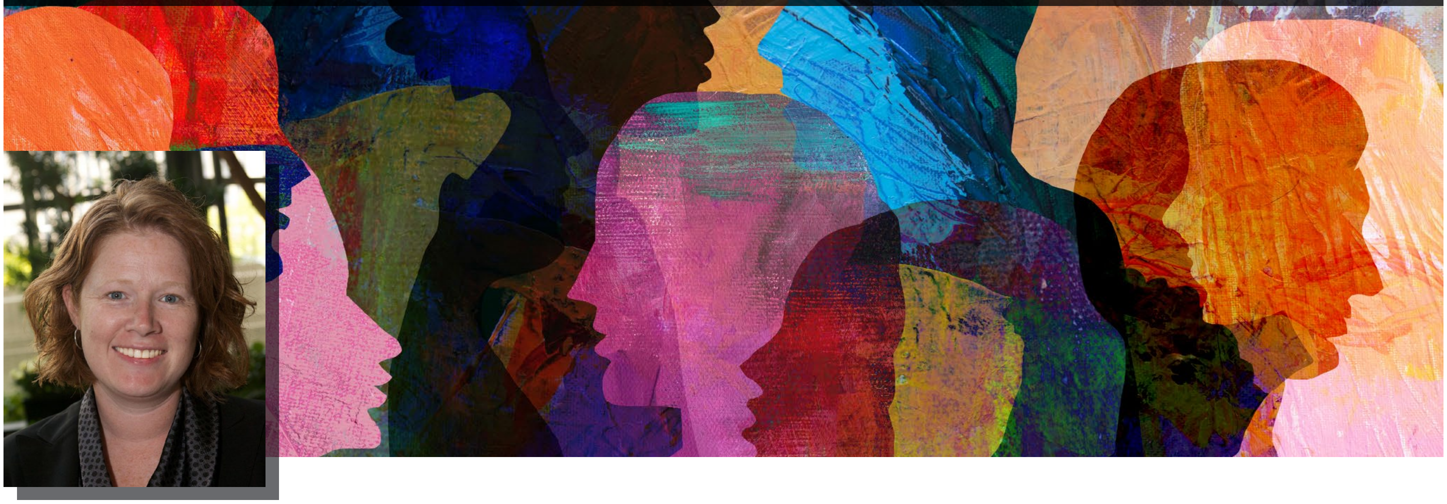
IEC Technical Committee 72 develops international safety standards for automatic electrical controls used in household and similar applications. Its work supports global harmonization and enhances the safety and performance of devices used in everyday life.

If you or your organization work with sensing technologies and would like to help, IEC/TC 72 invites you to get involved. Professionals and organizations interested in contributing to this important work are encouraged to contact their National Committee to the IEC and get involved in shaping the future of sensor standardization.

Visit www.iec.ch for more on how to participate in TC 72/WG12.

ADVANCING GENDER DIVERSITY IN STANDARDS: IEC'S COLLABORATIVE APPROACH

Megan Hayes – Vice President, Standards and Technical Affairs, NEMA; Chair of the IEC Diversity Advisory Committee



This article is part of a series explaining the importance of the USNC Strategic Objectives.

In early 2025, the International Electrotechnical Commission (IEC) made a significant step toward institutionalizing diversity and inclusion in electrotechnical standardization. The IEC's Diversity Advisory Committee (DAC) released a new guidance document, Improving Gender Diversity in Standards Development: Guidance for National Committees, which offers practical recommendations to national committees (NCs) seeking to improve gender balance in their governance, operations, and standards-development work. This document is the result of a dedicated and collaborative effort by the DAC in conjunction with IEC National Committees through the IEC Forum.

WHY GENDER DIVERSITY MATTERS

IEC recognizes that diversity is a core organizational principle, essential for ensuring that standards are relevant and representative. Despite progress, women remain underrepresented in standards development, even in sectors where their employment rates are higher. This gap not only affects the inclusivity of standards but also limits the potential for innovation and improved decision-making within technical committees.

Research cited in the guidance shows that gender-diverse committees perform better, with those including women scoring 14% higher in independent evaluations. Greater gender diversity is also linked to better oversight, ethical policies, and enhanced innovation.

WHAT THE USNC CAN DO: A PROPOSED ROADMAP

For the U.S. National Committee (USNC) and its members, this guidance provides both a call to action and a toolkit for change. The USNC is well positioned to lead by example. The IEC Guidance suggests the following actions for National Committees:

- **Collect and Track Gender Data:** Understanding current participation levels is key to setting goals and measuring progress.

- **Set Measurable Targets:** Striving for at least 30% representation of each gender is recommended, with the ultimate goal of parity.
- **Intentional Outreach:** NCs are encouraged to actively recruit women, leverage referrals, and engage with women's organizations.
- **Support Retention:** Creating inclusive environments and monitoring retention rates helps ensure that women remain engaged in standards development.
- **Inclusive Meetings:** Adopting UNECE guidelines for respectful engagement and balanced participation ensures all voices are heard.

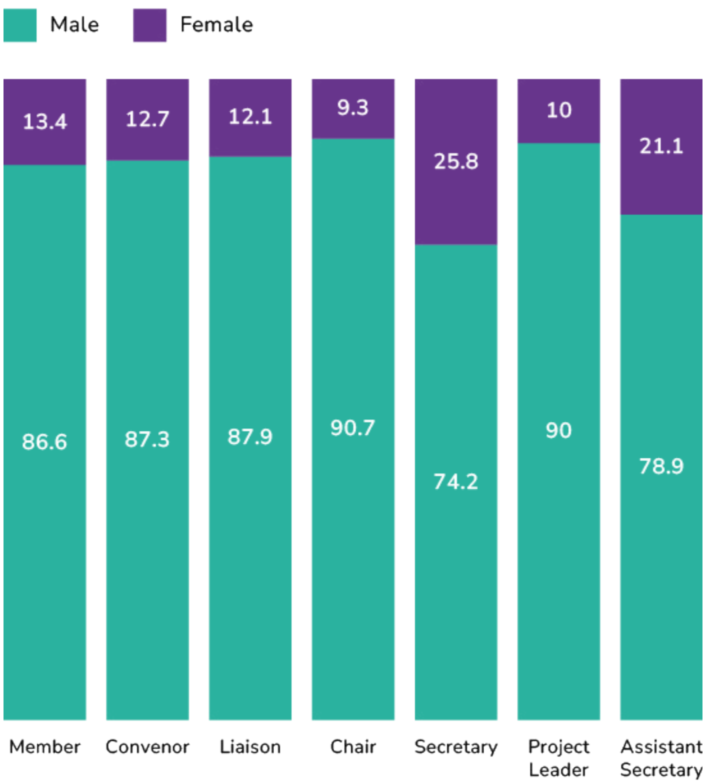
U.S. DATA

The IEC has established a performance parameter dashboard that is accessible by all National Committees. The USNC should review its gender statistics and monitor the data for any changes.

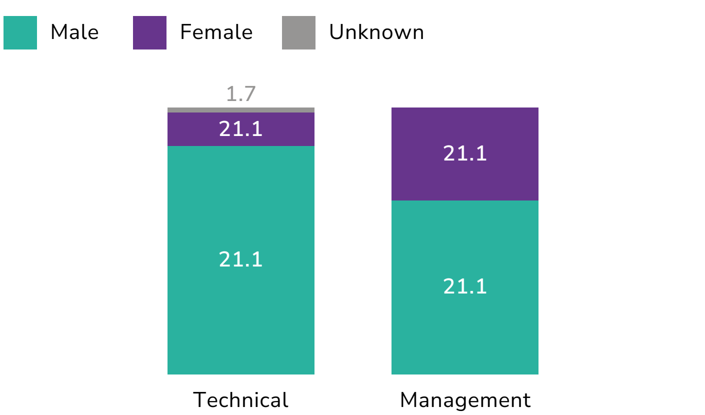
USNC Gender Diversity (%)

The dashboard also allows National Committees to view data in other ways, including by role and activity. Below are the 2024 statistics for the USNC by role and activity.

Gender Diversity by Role (%)



Gender Diversity by Activity (%)



POTENTIAL CHALLENGES & MITIGATIONS

No change effort is without friction. Some critics of gender diversity initiatives in standardization argue that such efforts undermine meritocracy or distract from technical excellence by prioritizing demographics over expertise. Others question whether gender representation is a relevant consideration in a field driven by objective technical data and engineering principles. There can also be skepticism about setting targets or collecting demographic data, which some perceive as bureaucratic or politically motivated. To mitigate these concerns, it's important to emphasize that diversity and merit are not competing goals—broadening participation expands the pool of qualified experts and strengthens decision-making. Clear communication about the purpose and benefits of inclusion, transparent selection criteria, and evidence that diverse teams produce better standards outcomes can help build trust. Providing training on unconscious bias, highlighting success stories, and ensuring that all participants have equal access to mentorship and leadership opportunities can further reinforce that gender diversity enhances, rather than compromises, technical rigor.

CONCLUSION

The IEC's new guidance on improving gender diversity in standards development is more than a set of recommendations—it is a testament to what can be achieved through collaborative leadership and a shared commitment to inclusion. By embracing data-driven approaches, setting ambitious yet achievable targets, and fostering inclusive environments, National Committees can ensure that standards development reflects the richness of the communities it serves. The USNC can and should lead the way in improving gender diversity through continued collaboration, transparency, and a focus on both excellence and equity to building a more innovative, effective, and representative standards ecosystem for the future.

USNC/IEC TRAINING & EDUCATION

New to USNC? The USNC provides education and training resources for electrotechnical standardization and conformity assessment.

We encourage you to take advantage of our training opportunities available now on the USNC webpage!

- USNC Constituent Training Modules
- USNC Effective IEC Participation Webinar
- USNC & IEC Conformity Assessment 101
- Why IEC Standards Work Is Important to My Company
- Benefits of Standards Work for Emerging Professionals
- Check out our new OSD Resource page.

Looking for more? IEC Academy & Capacity Building hosts frequent webinars. You can access past webinar recordings and register for upcoming webinars here.

WHEN GLOBAL STANDARDS COLLIDE: HOW IEC 60364-7-751 COULD UNDERMINE UTAH'S PLUG-IN SOLAR FREEDOM

Achim Ginsberg-Klemnt, Dipl. Ing. (FH); Member of IEC TC 64

Rep. Raymond Ward MD, Ph.D. (R-UT)

In 2025, Utah made history. With bipartisan support, legislators passed H.B. 340 Solar Power Amendments, creating a new legal category for plug-in household appliances: *Portable Solar Generating Devices.* For the first time in the U.S., households could legally plug small, UL-listed solar systems directly into a standard outlet with no electrician, no interconnection paperwork, and no red tape.

This simple civil right to generate homemade electricity from balconies, backyards and driveways has put Utah at the forefront of energy democratization.

Similar to Germany's wildly popular "balcony solar," these Utah style plug-in solar kits are lightweight, renter-friendly, and affordable, letting everyday people participate in the clean-energy economy.

But as some standard committees push through a new rule for plug-in generators, the global tide could turn against this freedom.

"A generating set shall not be connected to a final circuit."

At first glance, the draft IEC 60364-7-751 looks technical and harmless. It's a proposed international installation standard for "low-voltage generating sets." Yet buried inside the proposed draft is a bombshell line: "A generating set shall not be connected to a final circuit."

Translated from standard jargon, this means: *no more plug-in solar through standard outlets.*

In practice, every small solar device from Germany's balcony solar kits to Utah's "Portable Solar Generating Devices" would need a dedicated circuit or a hard-wired connection to be compliant.

In Europe, where IEC standards often become law, this clause could spell the end of plug-in PV freedom. And while the U.S. usually doesn't directly adopt IEC standards, global product design, insurance, and safety certifications often follow them.

The United States uses UL Standards like UL-1741 or UL-9741. The U.S. National Electrical Code (NEC 705) governs how distributed generation connects safely. Utah's H.B. 340 fits squarely within that regulatory framework by requiring anti-islanding protection, the same safety logic behind UL standards.

But here's where it gets tricky: If IEC 60364-7-751 becomes the global benchmark, manufacturers may abandon standard-plug designs to satisfy IEC rules. Supply chains could shrink, leaving Utah consumers with fewer affordable plug-in kits. Insurers or Authorities Having Jurisdiction (AHJ's) might start citing the IEC rule as best practice, creating unnecessary barriers for devices that are perfectly safe and legal under U.S. law.

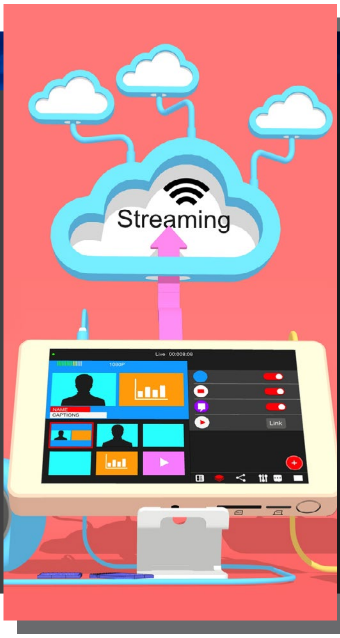
International dual compliance, one designed for countries that adopt the new IEC rule, another for the U.S., could increase costs and delay innovation.

What Utah envisions to empower homeowners could be slowly undermined by an IEC technicality.

The conflict isn't just about plugs, it is about power, literally and politically. The IEC model assumes energy flows one way, from the grid to the home, and that exporting electricity through plug-in connectors is inherently risky for household appliances. The Utah model assumes citizens, when guided by UL-listed safety standards, can responsibly generate power for themselves and occasionally export modest amounts of electricity to the grid.

In reality, advances in anti-islanding technology and the UL-1741 standard have long rendered those risk concerns moot: modern inverters automatically and almost instantaneously shut down the moment grid power is lost, ensuring that no backfeed can endanger lineworkers or equipment.

These are fundamentally different visions of who gets to participate in the energy market. Utah's approach embraces distributed generation. The IEC's proposed clause re-centralizes control, reinforcing a utility-only monopoly on electricity generation.



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Other U.S. states are watching closely. If IEC 60364-7-751 gains global dominance, the result could result in higher hardware costs for small systems, reduced innovation in portable, modular energy products and in more entry barriers for low-income and rental households the very groups portable solar was designed to include.

Globally, that means fewer people will be able to generate their own homemade electricity.

To avoid unintended consequences for distributed generation, the IEC Technical Committee responsible for IEC 60364-7-751 should revise or remove the clause stating *"A generating set shall not be connected to a final circuit."* This prohibition, conceived with earlier generations of portable generators in mind, is inconsistent with the current state of inverter safety technology and the well-established protections embedded in UL-1741 related to electric shock protection through anti-islanding requirements.

Modern grid-interactive inverters are required to disconnect automatically and within milliseconds of a grid outage, eliminating the very hazards this clause seeks to prevent. Maintaining such language therefore creates regulatory friction without a corresponding safety benefit.

A constructive revision could clarify that plug-in generating devices certified to appropriate national or regional safety standards may connect through standard outlets when equipped with rapid-shutdown and anti-islanding protection. Aligning IEC guidance with these advancements would harmonize international safety objectives while preserving flexibility for innovative, consumer-scale generation such as Utah's Portable Solar Generating Devices.

By updating this single provision, the IEC can uphold its mission of ensuring electrical safety while avoiding unnecessary constraints on distributed, democratized clean-energy technologies.

To safeguard Utah's gains, U.S. regulators and standards bodies must reaffirm independence from IEC 60364-7-751 and expand UL and NEC frameworks for plug-in generation, ensuring consistent safety without restricting access to defend consumer choice because democratized solar isn't a loophole; it's a lifeline for resilience and US energy dominance.

Utah's H.B. 340 shows a path how portable solar can be both safe and liberating. The rest of the world should take note instead of taking it away.

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