USNC CURRENT

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FOCUS ON LITHIUM BATTERIES AND SAFETY

The lithium-ion battery market is projected to surpass $53 billion by 2024. Driven by continued growth of mobile devices, hybrid and electric vehicles, and drones and hoverboards, along with the expansive needs of the Internet of Things, industrial digitalization, and mobile healthcare, standardization activities for lithium batteries have a critical role to play in a safe digital future.

Leading the Way in Battery Safety

By: Ken Boyce, Principal Engineer Director, UL, and Judy Jeevarajan, Ph.D. , Research Director, Electrochemical Safety, UL

Batteries surround us. Our workplaces and homes are filled with them, they are in our cars and buses and airplanes, and we carry them with us everywhere. Battery technology has been transformational in our society in profound ways. While this transformation unfolds around us, it is easy to take for granted the technical work that has served as the foundation. Since Volta's experiments in Italy two hundred years ago, some of the most important aspects of that work have been spearheaded in the United States. From research, to standards, to testing and certification, to engaging leaders across the stakeholder communities, to educating the public about safety, the U.S. community has been highly active in advancing battery technology and sharing our work with our colleagues around the globe. UL is proud to be a longstanding and active member of this rich and important community.

Research to the Rescue

The foundation for battery safety is good scientific discovery. Experts in the United States – from Thomas Edison, to scientists from NASA and U.S. National Laboratories, to industry – have been extraordinarily strong in carrying out that research to identify technical findings that lead to new opportunities. But with new opportunities and technologies also come attendant safety implications. At UL, our world-class battery research scientists have been looking at the safety challenges for many years. The work they have done to understand the failure mechanisms of lithium batteries has been critical in supporting better ways to assess risks and to prevent failures from occurring. That heritage endures as we continue to ask and answer critical questions about battery safety.

Two current key areas of focus are fire suppression and the safety of aged cells and batteries. In the area of fire suppression, UL tested several fire suppressants with lithium-ion battery modules, with applications at different times and in different locations. The results of the tests were presented at the Space Power 2016 Workshop, conducted by the Aerospace Corporation, as well as at the Battery Safety 2016 Conference, organized by the Knowledge Foundation. Future work will include research on fire suppressants for larger battery modules: advance modeling techniques and the *(continued)*

IN THIS ISSUE

IEC symbols for electrical current: ALTERNATING CURRENT (AC) DIRECT CURRENT (DC) AC/DC

Leading the Way in Battery Safety *(continued)*

optimal practical solutions. The study involving the safety of aged cells and batteries included studying the safety characteristics of fresh and cycled cells and cell modules, and yielded insights into the degradation mechanisms on the cell components, namely, the cathode, anode, electrolyte and separator induced by cycling. This direction of research will be important for enabling continued expansion of battery technologies for all users.

Standards, Conformance, and Cooperation

Good standards adapt scientific findings into practical risk mitigation strategies. The U.S. has led the way in this effort of converting the safety science into specific battery safety standards. Standards such as UL 1642, *Standard for Lithium Batteries,* published decades ago, have played a foundational role in supporting the safety of batteries.

At UL, we have continued to expand that important effort to support the safety of new battery technologies, battery powered products, and battery systems by leading the development of a large suite of American National Standards. These standards identify essential principles for safe battery and battery product design and development, and lay the groundwork for real-life, targeted assessments of the battery designs from cells to packs to systems over a wider range of uses.

Active engagement of U.S. and global industry, academia/research institutions, government experts, battery users, consumers, and other experts drive consensus standards. However, our work does not stop there. Cross-collaboration with other U.S. standards developers, such as NEMA, supports coordinated requirements within the United States for issues like ratings, form factors, performance, and safety.

UL has also been active in publishing binational battery standards for the United States and Canada, quickly advancing the science-to-standard process for the safety of more people across North America, and making it easier for manufacturers to navigate compliance and for the distribution chain to address safety concerns. Standards such as ANSI/CAN UL 9540, *Safety of Energy Storage Systems and Equipment,* and ANSI/CAN UL 2272, *Safety of Electrical Systems for Personal E-Mobility Devices,* are recent examples of this binational approach to rapidly and effectively address evolving applications. The USNC efforts to advance effective solutions within the United States to a global scale have been very positive, and we are glad to be a part of this important and ongoing effort. Working to harmonize U.S. standards with the IEC documents, as applicable, has been productive in carrying the global standards development process forward.

KEN BOYCE, JUDY JEEVARAJAN

Testing and conformity assessment demonstrate that the risk mitigation strategies from standards are translated into confidence in the marketplace. Battery technologies present some unique challenges to testing, and facilities must be carefully developed to address the hazards – both apparent and latent – in carrying out battery tests.

Responsive Development

As battery designs rapidly evolve, it is imperative to stay on the cutting edge of technology, proving that innovations do not bring latent hazards and that safety improvements effectively accomplish their objectives. For example, as electronics proliferate, and we as a society want to do more things from most anywhere without worrying about pausing to recharge or carrying large objects or heavy weights, we see an incredible demand for *(continued)*

Figure 1: Photos of cathode (top) and separator (bottom) from a cell that had been cycled until 10% of its capacity was lost showing degradation of the cathode active material and its adherence to the separator.

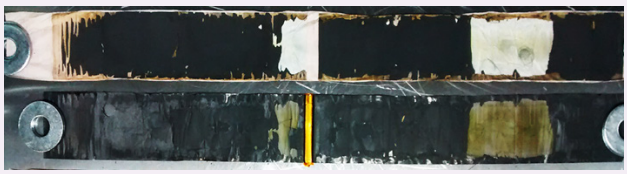

Figure 2: Photos of cathode (top) and separator (bottom) from a cell that had been cycled until 10% of its capacity was lost and then undergone an overcharge test showing degradation and adherence of ceramic coating of separator to the cathode.

Reference: J. Jeevarajan, P. Mukherjee, D. Robles, 2017 Energy Storage System Safety Workshop, Santa Fe, NM, Feb 2017

Leading the Way in Battery Safety *(continued)*

batteries with longer life and more capacity.

The same is true for transportation, as consumers push for greater range, more time between charges, and less weight. This increasing energy density of batteries, which is what makes them attractive to us as users, also presents major challenges in safety. There are numerous chemistries for batteries with unique value propositions. However, in many regards the attributes of lithium-ion chemistries are selected to address what we as a society seek today. For this reason, it is the workhorse technology of today and the near future, and careful attention is needed to mitigate thermal runaway vulnerabilities for lithium-ion batteries. Making sure we adapt both standards and conformity assessment to match innovation is important and UL has definitely accepted that challenge.

In the last several years, UL has published important new battery standards to add to the established portfolio, including new standards for safety of large format batteries, motive batteries, and energy storage systems. Unexpected practical challenges associated with batteries, such as ingestion of coin cells by children, were addressed by work in U.S. standards ANSI/UL 60065, *Safety Requirements for Audio, Video, and Similar Electronic Apparatus,* and ANSI/UL 4200A, *Products Incorporating Button or Coin Cell Batteries of Lithium Technologies,* leading to global efforts.

Work to quickly address the hoverboard crisis has set the bar higher in terms of urgency and focus, but the release of ANSI/CAN UL 2272 in an incredibly compressed time has shown the art of the possible. New standards for electrical battery systems of drones, EV batteries being repurposed into the infrastructure, microgrids, and other uses are underway. The Internet of Things revolution will drive exponential expansion of connected devices with the need for battery power to monitor and communicate. Wearable technology, driven by battery power, will foster innovation in ways we cannot even see now. We know that humankind will continue to relentlessly push for new innovations and batteries will play an important role. The USNC, and UL, will continue to drive battery standards forward.

NEW STANDARDS FOR BATTERY SYSTEMS OF DRONES, EV BATTERIES REPURPOSED INTO INFRASTRUCTURE, MICROGRIDS, AND OTHER USES ARE UNDERWAY.

WORK TO QUICKLY ADDRESS THE HOVERBOARD CRISIS HAS SET THE BAR HIGHER IN TERMS OF URGENCY AND FOCUS.

Engagement and Outreach

Continued outreach is important for leveraging the perspectives and strengths of the technical community. For example, the Lithium Battery Safety Summit, organized by UL in December of 2014, was held to convene experts across the continuum of those engaged with batteries. It was also used as a forum for the National Transportation Safety Board (NTSB) top share the finding of the Boeing 787 Dreamliner investigation. The event was productive in engagement, sharing, and alignment and has led to some critical efforts in the sector. UL has also held subsequent Battery Summits in different locations around the world, including China, India, Canada, and South Africa, in an effort to educate others on battery safety. These have been highly informative and also have allowed for the sharing of important ideas.

Additionally, we continued our efforts through the establishment of the Battery Safety Council in 2015, co-chaired by UL and the NTSB, which brought together various sectors from academia, government, manufacturers, automotive, aviation, and aerospace. The charter of the Battery Safety Council is to provide an open forum for the sharing and resolution of battery-related safety issues faced by the battery industry and users. Of course, the IEC Technical Committees for batteries (including IEC TC 21 and IEC TC 35) remain an essential place to share ideas as well.

Continuing to engage groups like

Leading the Way... *(continued)*

first responders and those involved with transportation will be essential for driving to the best overarching uses of batteries. UL also has looked forward to STEM education of the next generation of battery scientists and engineers, while supporting safe behaviors today, in developing our new UL XPLORLABS™ interactive battery educational platform.

Looking Ahead

The future is worth thinking about as it relates to batteries. The excellent effort of the USNC and its experts has supported continued progress in battery safety in our country and around the world. As we see new energy demands and new energy opportunities that can be filled by batteries, the notable efforts of the USNC will need to progress to ensure the best outcomes are achieved through standards. UL looks forward to continuing to play an important role in the ongoing research and standards development in order to promote safe development and use of higher powered batteries in the future.

Thank You 2017 USNC Premier Members

The USNC would like to express its sincere thanks to our Premier Members, without whose support our activities would not be possible.

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Telecommunications Industry Association
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U.S. Coast Guard
U.S. Department of Defense
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DECISION DEPOT

This new quarterly 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 links below to access the recent decisions:

- SMB Decisions Document (6090/DL)
- DMT Decisions Document (SMB 6034 R)
- CAB Decisions Document (CAB 1580 DL)

A History of Standards Development for Lithium Primary Batteries

By Carin Stuart, Associate Manager, Government Affairs, Energizer

Lithium iron disulfide battery chemistry was launched in the consumer market in 1989 in the "AA," size and a few years later in the "AAA" size. Before this time, commonly used battery chemistries were transitioning from carbon zinc to alkaline. The development of this primary (non-rechargeable) lithium battery chemistry was to provide a more powerful battery for the marketplace. This chemistry offers many advantages over other primary battery chemistries.

Lithium iron disulfide differs from alkaline batteries in chemistry and construction. Lithium batteries are built in a spiral construction featuring two long, thin electrodes rolled together to form a jellyroll shape. This shape provides almost 20 times more interfacial surface area than a standard alkaline. This large interface helps to meet the power demands of many of today's devices.

Lithium is the lightest, most active metal. When this powerful metal is paired with iron disulfide, this energy is available at a voltage suitable for 1.5 volt applications. Because lithium iron disulfide batteries are substantially different in construction from alkaline batteries, they require separate standards to be developed focused on the characteristics unique to this product.

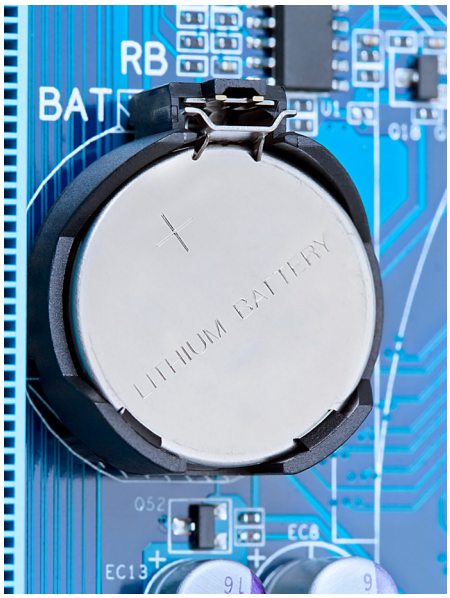
Dimensions were already standardized for other chemistry types and since lithium iron disulfide batteries were intended to be used in the same devices and battery cavities, they already conformed to the specified form factors. IEC Technical Committee (TC) 35, *Primary Cells and Batteries,* oversees the preparation of standards that relate to dimensions, performance, and guidance on safety matters. In 1996 the first edition of IEC 60086-4, *Safety of lithium batteries,* was published covering all consumer chemistries of lithium batteries. More recently the lithium iron disulfide chemistry was added to Edition 13 of IEC 60086-2:2015, *Physical and electrical specifications.* Even though this product has been on the market since 1989, until recently it did not fulfill the IEC requirement for standardization that the product be manufactured in more than one country and by more than one manufacturer. So it has only been recently that specifications for performance have been standardized for this long-standing product.

In the U.S., the ANSI Committee C18 on *Portable Cells and Batteries* administers the publications ANSI C18.3M, *Part 1 For Portable Lithium Primary Cells and Batteries – General and Specification,* and ANSI C18.3M, *Part 2 For Portable Lithium Primary Cells and Batteries – Safety among other standards for portable batteries.* Both of these standards were published in 1996, as the use of various lithium battery chemistries expanded. The lithium battery industry keeps both ANSI and IEC standards revised and current because there are requirements unique to the United States for batteries and because there are different minimum hurdles to meet for standardization of chemistries between IEC and ANSI. The industry can standardize new lithium chemistries faster in ANSI than in the IEC.

Lithium safety has been in the news over the past few years. There are numerous standards and regulatory requirements for both primary and secondary (rechargeable) lithium batteries of all chemistries. These standards include IEC 60086-4, IEC 62281, UL 1642, ANSI C18.3 P2, and the UN Manual of Tests and Criteria 38.3 T-Tests. All have directionally similar testing requirements but the main differences between them are the stated use conditions for the documents.

For example, IEC 60086-4, ANSI C18.3P2, and UL 1642 are focused on general use safety of the product while IEC 62281 and UN 38.3 are focused on safety during transport. Most lithium safety standards test how batteries respond to altitude, thermal shock, vibration, mechanical shock, external short circuit, crush/impact and forced discharge. However, beyond those core test methods additional use-specific testing is outlined in the various standards. These specific-use tests ensure that the battery is safe when the battery is subject to the expected use-cases of the battery. Some examples of other test methods include testing for incorrect installation and *(continued)*

A History of Standards Development for Lithium Primary Batteries *(continued)*



partial use testing.

To transport lithium primary batteries, the UN Manual of Tests and Criteria Section 38.3 outlines the required tests that lithium batteries must meet in order to be transported in commerce around the world. In addition to these tests, there are labeling, maximum quantity and aircraft location and prohibition requirements that must be met. Changes to these requirements continue to be revised as new chemistry types of lithium batteries come onto the market. Historically there have been two UN numbers assigned to bulk shipments of batteries, UN3090 for lithium metal batteries and UN 3480 for lithium ion batteries. There are different requirements for transporting lithium batteries in and with equipment.

With the recent commercialization of a lithium metal rechargeable battery, the UN Subcommittee of experts on the transport of dangerous goods has agreed that the dangerous goods classification system for lithium ion and lithium metal batteries should be changed. This work will begin this year and will involve the development of a comprehensive risk based system to classify lithium ion and lithium metal batteries. The work will be to determine classification criteria and associated test methods to develop new transport provisions. It is expected this work will take multiple years to complete and will greatly impact how lithium batteries are transported. These changes may also lead to changes in other lithium battery safety standards.

As consumer devices continue to require more power and longer run-times, the number of lithium battery chemistries will continue to proliferate in the market and new chemistries will be developed. Given the benefits of the lithium chemistries, these battery types are showing up in not only high-drain devices but also devices that require long runtime. Both of these applications push batteries to be more powerful in terms of capacity (mAh). Additionally, uses in the military, medical, automotive and industrial markets continue to expand the use of these batteries into unique and varied applications that may entail harsh environments. This will subsequently require standards development work to continue on to keep up with innovation to ensure the safe use, safe transport and proper run-time claims for this chemistry.

CARIN STUART

DOCUMENTS OF INTEREST

Stay up on the latest policies, documents, and other resources from the USNC, IEC, ANSI, and partners.

- TC News
- USTR Foreign Trade Barriers Report
- IEC White Paper – Energy Storage
- Aiming for 100% Interoperability
- Better to Blow a Fuse

The Testing and Certification of Batteries

By Jim Green, Global Business Manager for Energy Storage, CSA Group

Recent safety recalls of portable device and computer batteries point out the challenges that manufacturers face in an environment where consumers continually demand smaller devices, with higher power, longer run time, and lower cost. Manufacturers strive to make these improvements without sacrificing safety, quality and manufacturability.

The vast majority of manufacturers in today's competitive environment are reputable companies who expose their designs to a wide range of test programs in an effort to produce safe, quality products. Product development testing, certification to industry standards, supplier component evaluation, and end product quality assessment are conducted to ensure that the design meets performance, durability, reliability, and safety specifications. This detailed and thorough process provides confirmation that end products are manufactured to consistently meet the design guidelines with extremely low defect rates.

Specific to the certification process, a manufacturer will submit product documentation and a limited number of samples to a Nationally Recognized Test Laboratory ("NRTL") such as CSA Group. These samples will be evaluated against the applicable standards starting with a review of the construction and followed by the certification test program.

The construction review will analyze the design to confirm that it meets general safety considerations for normal use and what CAN/CSA-E62133:13, IEC 62133, and many other standards identify as "reasonably foreseeable misuse". Standards do not predict the wide variety of abuse to which products might be subjected, so more aggressive abuse tests may be a part of the manufacturer's product development testing.

For batteries, examples of what may be assessed in the construction review include the insulation and wiring, venting, terminal contacts, the methods used for temperature, voltage, and current management, and the assembly of the cells into the pack. Where applicable, internal component certification documents, a manufacturing quality plan, an operator's manual, and a failure analysis such as a Failure Modes and Effects Analysis (FMEA) will also be assessed.

Next, the test program will begin by conducting any preconditioning of the test samples that might be required by the standard. For batteries, this might include charge/discharge cycling for a specified number of cycles or duration. The test program will then subject the battery to a series of tests, typically including tests designed to place the battery under mechanical, electrical, and/or environmental stress. The test standard will specify the criteria for failure of each test, which might be fire or explosion in the case of a lithium ion cell for example.

Assuming all the support documentation, the construction review, and the test results are acceptable, the manufacturer will be granted a limited right to use the agency's certification mark with the certified product. The manufacturer will be subject to periodic factory inspections, which are designed to audit whether a company is manufacturing their product exactly as specified in the certification. These inspections are required in part to monitor manufacturers who might substitute less expensive, non-certified components into their manufacturing process to save cost. Other reasons for inspection may include detecting issues such as components from new suppliers or minor design changes which might not be in the certification file. The manufacturer and certification agency will then work together to make sure the file is up to date and any changes requiring further certification tests will be reviewed.

The fact remains, a reputable manufacturer could build a product bearing a certification mark from an accredited agency, and be

(continued)

The Testing and Certification of Batteries *(continued)*

subjected to periodic factory inspections, and a failure and recall could still occur. Manufacturing defects will inevitably occur during mass production. A robust design that is engineered to fail in a non-hazardous manner, combined with a well-managed supplier and production quality system, will help minimize the risk of failures and catch most defects before they reach the public.

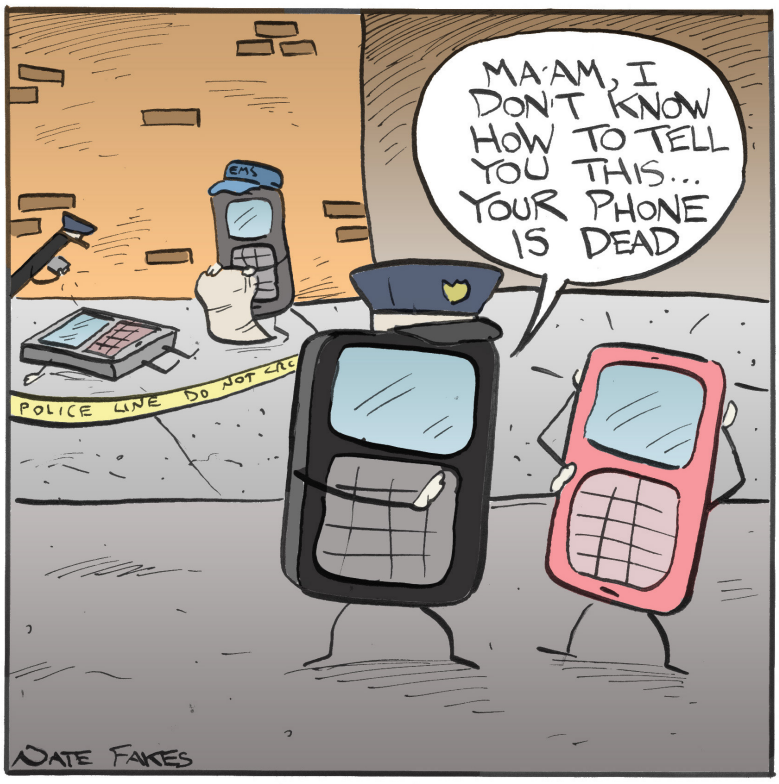
Companies may hire third party testing partners to conduct ongoing quality testing and evaluation programs. These may include procurement of samples from retail shelves to ensure a random sampling of products that have been subjected to a realistic transportation and handling environment. Additional testing of supplier components may also be conducted through independent labs to increase the robustness of the supplier quality program.

When a defect occurs that is undetectable during the manufacturing process, failures in the field may occur. Manufacturers will then work with their customers, their internal quality departments, and potentially government safety agencies to isolate the batch of products which might carry the defect. Third party labs may again be consulted to assist with failure analysis, conduct a larger sample of testing to determine failure rates, or to confirm that design modifications to address the failure are successful. Depending on the hazards which might occur if a product fails, the manufacturer may request that a customer return the product or dispose of it for a refund or replacement. In some cases, the manufacturer may voluntarily issue a safety recall of all potentially effected products, or may be ordered to by the government safety agency. At this point, significant effort will be made to remove the product from the market.

Product safety is a complicated process. Manufacturers go to great lengths to prove their designs and production processes, especially with potentially hazardous products such as batteries and energy storage systems. Ensuring a product is compliant with applicable industry standards and carries a certification mark issued by a NRTL such as CSA Group is a critical step in this process.

JIM GREEN

LAUGH TRACK



LAST CHANCE! Nominations for IEC Young Professionals Workshop Due May 1

United States National Committee of the IEC

The USNC is currently seeking nominations of emerging electrotechnology professionals to participate in the upcoming IEC Young Professionals 2017 Workshop, which will be held on October 9–13, 2017, in Vladivostok, Russia, in conjunction with the 81st IEC General Meeting (GM). Nominations can be submitted using the USNC Young Professionals (YP) Workshop Nomination Form until May 1, 2017.

YP Program Background

Each year, the IEC Young Professionals Workshop assembles international candidates at the beginning of their careers in electrotechnical standardization who have been chosen by IEC National Committees around the world. The program supports the increased involvement of young professionals in international electrotechnical standards and conformity assessment work, bolstering the future of technology transfer and long-term national involvement in the international standardization arena.

Alongside recipients from other nations, the USNC-selected young professionals will take part in a dedicated workshop covering information about the IEC and relevant strategies for international standardization and/or conformity assessment work. Networking opportunities will help cultivate long-term involvement of young people from all over the world in international standardization. Participants will also be given the opportunity to visit local industry, receive guidance from a mentor, and observe a meeting of the IEC Standardization Management Board (SMB) and Conformity Assessment Board (CAB). Individuals chosen to take part in the 2017 Young Professionals Workshop will be financially supported for their travel to Vladivostok and for up to three nights of accommodations.

Nomination and Selection Process

The USNC will select up to three young professionals to represent the United States at the 2017 workshop. The selectees may be employed by industry, the government, academic bodies, consumer organizations, or any other member of the U.S. standards and conformance community that uses, benefits from, or contributes to the IEC's work in electrotechnical standardization and conformity assessment. The program is intended for individuals who have completed their undergraduate education and are in the early stages of their profession—graduate engineers or managers, for example.

Candidates may be nominated by any interested stakeholder who is not a member of the program's selection panel; letters of support from members of the standardization community testifying to the candidate's appropriateness for the workshop and significant achievements to date are highly encouraged. Prospective candidates may also nominate themselves, but must provide at least one letter of professional recommendation and written assurance that their employers have agreed to allow them to attend the 2017 IEC GM if selected.

Candidates will be judged based on their demonstrated leadership and dedication in connection with standardization and/or conformity assessment activities, as well as their vision of the larger commercial and strategic impact of standards and conformance work, and their accomplishments in their chosen field of activity. Nominated individuals will be assessed by a selection panel made up of USNC officers, standing committee officers, former U.S. Young Professionals Workshop participants, and a pool of USNC Honorary Life Members. All individuals chosen to take part in the 2016 Young Professionals Workshop will be notified in May 2016.

Don't Miss the Deadline!

To nominate yourself or another individual, complete the USNC Young Professionals Workshop Nomination Form and submit it to Kendall Szulewski-Francis at ksfrancis@ansi.org **by Monday May 1, 2017.** For more information about the IEC YP Program, visit www.iec.ch/members_experts/ypp/.

ANSI Opens Nominations for 2017 Leadership and Service Awards

ANSI 2017 Leadership & Service Awards

Celebrating Excellence **Nomination Deadline: June 16**

ANSI has announced a call for nominations for its 2017 Leadership and Service Awards. Presented in conjunction with World Standards Week 2017, the awards honor individuals who have made significant contributions to voluntary consensus standardization and conformity assessment programs and have consistently demonstrated a commitment to their industry, the nation, and the enhancement of the global standards system.

"The annual awards program is a long-standing and valuable ANSI tradition," said S. Joe Bhatia, ANSI preswident and CEO. "We welcome this opportunity each year to recognize the tremendous contributions that individuals with diverse backgrounds and perspectives make to standards and conformity assessment issues that affect both the economy and our well-being."

The following Leadership and Service Awards are open for nominations:

- Astin-Polk International Standards Medal
- Coonley Medal
- Finegan Standards Medal
- Lohse Information Technology Medal
- Meritorious Service Award
- Next Generation Award
- President's Award for Journalism
- Ritterbusch Conformity Assessment Medal
- Thomson Electrotechnology Medal
- Wham Leadership Medal

Representatives of industry, government, academia, consumer organizations, and the U.S. voluntary consensus standards and conformity assessment community, with the exception of current officers of the Institute's Board of Directors, are considered eligible for an award. Recipients will be chosen from the list of nominees by an awards committee comprised of the officers of the ANSI Board of Directors.

ANSI will honor the 2017 award recipients on the evening of Wednesday, October 18, 2017, at a banquet and ceremony to be held at The Watergate Hotel in Washington, DC.

Nominations are due by Friday, June 16, 2017 (5 p.m. Eastern).

Along with the nomination form, letters of support from members of the standardization community attesting to the nominee's outstanding achievements and appropriateness for receipt of the award are strongly encouraged. The nomination forms are available here. Winners will be announced by August 2017.

For information detailing the nomination procedure, the recipient selection process, and nomination forms, visit www.ansi.org/awards.

World Standards Week 2017 Schedule Released

ANSI has announced the schedule of events for World Standards Week (WSW) 2017, on October 16–20 in Washington, DC. WSW is an annual event where members of the standards and conformity assessment community come together in the spirit of cooperation and collaboration.

MONDAY, OCTOBER 16, 2017

- Joint Meeting: ANSI National Policy Committee / Conformity Assessment Policy Committee

TUESDAY, OCTOBER 17, 2017

- ANSI Service Sector Conference with SPRING (Singapore), Day 1

WEDNESDAY, OCTOBER 18, 2017

- ANSI Service Sector Conference with SPRING (Singapore) Day 2
- ANSI Legal Issues Forum 2017
- 2017 ANSI Awards Reception, Banquet, and Ceremony

THURSDAY, OCTOBER 19, 2017

- ANSI New Member Orientation Breakfast
- ANSI Joint Member Forum
- ANSI Annual Business Meeting Luncheon
- U.S. Celebration of World Standards Day 2017

FRIDAY, OCTOBER 20, 2017

- ANSI International Policy Committee Meeting

Visit www.ansi.org/wsweek for complete information, including further details on events, sponsorship opportunities, and registration when it is available.

Sponsor the IEC 2022 General Meeting Hosted in the USA!

For only the seventh time since 1904, the United States is gearing up to host the IEC General Meeting, in October 2022. Organizations with a stake in all areas of electrotechnology are invited to demonstrate their commitment to international standardization and conformity assessment through sponsorship of the ten-day event.

For more information, see the IEC 2022 Sponsorship Brochure or contact USNC/IEC Secretary General Tony Zertuche at tzertuche@ansi.org or 212-642-4892.

Thank You to the Organizations Already on Board as IEC 2022 Sponsors

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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.

HOW TO CONTRIBUTE
Contributions are gladly accepted for review and possible publication, subject to revision by the editors. Submit proposed news items to: Tony Zertuche, USNC/IEC General Secretary, ANSI
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tzertuche@ansi.org

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New York, NY 10036
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Mark Your Calendar for Upcoming Meetings & Events

2017

1 – 5 May
COPANT/PASC
Vancouver, Canada

5 June
TAG Leadership Workshop
Registration Link
Eaton, Pittsburgh, PA

6 June
IEC Procedures & Process Training
Registration Link
Eaton, Pittsburgh, PA

6 – 8 June
CAPCC/TMC/Council Meetings
Eaton, Pittsburgh, PA

12 June 2017
SMB Meeting
Geneva, Switzerland

13 June 2017
CAB Meeting
Geneva, Switzerland

7 – 8 September
FINCA
Ecuador

12 – 14 September
CAPCC/TMC/Council Meetings
Corning, Corning, NY

9 – 13 October
81st IEC General Meeting
Vladivostok, Russia
Monday 9: SMB/CAB
Wednesday 11: CB
Friday 13: Council

16 – 20 October
ANSI World Standards Week
Washington, DC

2022

October
86th IEC General Meeting
USA

For additional event info, visit www.ansi.org/calendar and search for "USNC" or "IEC."

UPCOMING 2017 ISSUES OF THE *USNC CURRENT*

www.ansi.org/usnc

Q II National Adoptions

Q III Membership Issue / SBB (Standards Boost Business)

Q IV Standards in Trade