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FOCUS ON: ACADEMIA & EDUCATION

Standards are a significant factor in who wins and who loses in the global marketplace – but it’s hard to win if you don’t know the game. Data show that very few new graduates begin their careers with a working knowledge of standardization. Education programs covering the development and implementation of standards and conformity assessment need to become a priority for U.S. educational institutions. Incorporating standards into university curricula is one important way to increase overall standards knowledge for future business and industry leaders – and give students a competitive edge when entering the workforce.

Strengthening Standards Education in the United States

A personal observation by Susan C. Hoyle, Senior Manager, Intellectual Property Rights Policy, Government Affairs, Qualcomm Incorporated

Ask almost any C-level executive about technical standards, and you will get a blank stare. Ask any graduating engineer about technical standards and you might get the same blank stare. Standards are not considered a basic business

tool by most U.S. companies...at least not yet. And standards are not considered essential course elements in engineering schools. Why isn’t there more integration of standards into engineering curriculum across the United States?

courses as part of the curriculum (*see “U.S. University Standards Course Offerings,” page 2*). Other countries, especially China, Japan, and Korea, have placed an emphasis on education about standardization as a basic component in maintaining their competitiveness in the 21st century, and have developed educational materials for standards for dissemination to universities, high schools, and even elementary schools. In fact, Tsinghua University in China has an entire masters degree focused on the subject of standardization.

According to research by Don Purcell, adjunct faculty for the graduate course on strategic standardization, School of Engineering, Catholic University of America, only four engineering programs of 400 in the United States even offer standards-related

Why is there a lack of knowledge of standardization in the U.S.?

Curricula at engineering schools are focused on technical subjects, not on related business subjects such as project management, standards, ethics, etc. The underlying issue is that today, a typical four-year academic program for engineering is packed with the core subjects, and there is very *(continued)*



Strengthening Standards Education in the United States (continued)

little leeway to add further requirements. Most engineering curricula do not cover a wide array of basic areas that an engineer needs in addition to technical skills. An effort is being made by several standards developers and industry to include a course on standards as part of the accreditation process by ABET, an accreditor of postsecondary degree-granting programs in applied science, computing, engineering, and technology.

Engineers hired by companies are highly qualified in technical subject matter, but seldom have much familiarity with standards or how the process works. A typical engineer, whether mechanical, electrical, or chemical, primarily knows acronyms like ASTM, ISO, ANSI, and IEEE. They may know the technical content of a standard – e.g., how to assemble a device, or how to create a design – but they generally do not know conceptually how standards benefit industry or fit into the bigger context of the marketplace. And in addition to a basic standards overview, it is also important for an engineer to have underlying skills such as interpersonal, negotiation, and marketing skills to be effective in the standards process.

Companies often do not have comprehensive internal training to supplement deficiency of knowledge regarding standards. More often than not, engineers are immediately immersed in standards development activities and briefed on specific procedures without understanding a broad-based standards system overview – in other words, “baptism by fire.”

No formal standards role exists within many corporate structures. Other contributing factors to the lack of knowledge of standards, including the lack of awareness of importance to industry in general, is a general sentiment that standards are a supporting element in the

business environment. Within the corporate structure, specialists exist for finance, marketing, information technology, and research and development, but there is no such role for a “chief standards officer.”

The U.S. has a cultural history of separation of roles between government and industry in standards development. In other parts of the world, a more formal collaborative process with industry, government, and academia exists. There appears to be a need for a shift in thinking about the critical importance of public-private cooperation in the development of standards in the United States.

The way forward

Companies from a variety of industries need to provide input to universities that basic knowledge of standards, including the big picture and overall process, is critical for graduating engineers.

A good starting point for the content of any course on standardization might include

the basic characteristics of standards systems, diversification of standards developers (consortia, etc.), global nature/regional nature of standardization and its effect on the market, the benefits and risks of developing standards, and different types of standards (performance, voluntary, regulatory, measurement, etc.).

Another level that merits instruction is the business aspect of standardization from a product manager or business development manager point of view, as well as financial considerations. Lastly, there exists a relatively low number of case studies on standardization, and not enough training on higher level skills such as negotiation and consensus building.

Companies can leverage technical staff (including alumni of certain targeted universities) and ask them to work with human resources/recruiting to convey this need for basic education on standards. Industry executives with technical backgrounds often sit on university advisory boards or are asked to teach technical courses. These industry leaders can influence the decision *(continued)*

U.S. University Standards Course Offerings

Arizona State University, College of Law
Technology Standards Seminar

Catholic University of America,
Engineering Management Program
Strategic Standardization

Purdue University, School of Engineering
Global Standardization

University of Colorado at Boulder, College
of Engineering and Applied Science
Standardization and Standards Wars

University of Pittsburgh, School of Engineering
Case Studies in Nuclear Codes and Standards
School of Information Sciences
Web Technologies and Standards



The Catholic University of America in Washington, D.C.

Strengthening Standards Education in the United States (continued)

makers on the importance of standards as part of the engineering curriculum. Just as consumers convey needs and desires to developers of products, industry needs to convey its desire to universities and recruiters and help start a tide of change.

Development of curriculum

It is a given that most universities will not automatically respond and offer a full course on the topic of standards. There is not a wide amount of instructional materials for standards. A typical engineering curriculum is full of required technical courses, and there is little room for additional requirements. Furthermore, although many parties have requested ABET to include standards as part of engineering curricula, acceptance of this request may take some time before it is actually incorporated by ABET.

The following recommendations provide a good starting point for universities looking to develop a standards curriculum:

- Universities may be able to draw on existing resources for materials, or collaborate with other interested parties (standards developers, companies, government, trade associations, etc.). If one subscribes to the philosophy that there are many stakeholders in the standards ecosystem, then it is reasonable to assume that the stakeholders can collaborate and benefit the greatest number of interested parties.

Companies with strong university relationships can offer to share already-developed internal modules (non-proprietary) with universities on a limited trial basis. Or, companies can cooperate with university faculty to modify existing company modules for university use.

Many standards organizations such as the American National

Standards Institute (ANSI), and even government agencies such as the National Institute of Standards and Technology (NIST), have prepared materials on the standards process. If universities can reach out to industry, standards organizations, and government, it may be possible to develop collaborative materials suitable for many universities.

In addition, the ANSI Committee on Education (CoE) and the USNC have developed basic online resources. To access the free online courses from ANSI, visit www.StandardsLearn.org.

- Universities can offer courses of different scales and in different formats (classroom, web-based, case studies). It is quite difficult to design an entire course for a term in one quick stroke. Taking advantage of the existing materials, a university can start small by offering students the option to do ANSI online courses. The school could also initiate a small, seminar series outside of the normal curriculum, with attendance required, and draw upon local industry for appropriate speakers.

Companies from a variety of industries need to inform universities that basic knowledge of standards is critical for graduating engineers.



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- Universities could consider incorporating standards in a global, general course focused on business tools for engineers which includes general skills outside of the core technical skills. Just like freshman engineers are offered an introductory course covering topics such as programming languages and computer-aided design (CAD), universities should consider offering an “other tools” course to seniors and graduate students. Such a course could include a variety of critical skills, including standardization, project management basics, finance, standards, public speaking, ethics, etc.

There is a pressing need for universities, standards developers, government, and industry to re-evaluate the importance of standards as a strategic business tool. Standardization is an unsung hero, and educating future engineers and business leaders about its power is of critical importance to a strong future. The above suggestions represent potential starting steps and considerations.

Further Information

If your company is interested in helping to promote standards education, join the [ANSI Committee on Education](http://ANSICommitteeonEducation.org). For details, contact Lisa Rajchel, secretariat, ANSI CoE, at lrajchel@ansi.org, or visit the [ANSI CoE website](http://ANSICoE.org). For more information on how standardization fosters business growth, visit www.standardsboostbusiness.org. ■

Standards in University Education: A Professor's View

By Stephen J. Elliott, Ph.D., Associate Professor and University Faculty Scholar,
Purdue University; USNC selectee for the 2011 IEC Young Professionals Competition

Residing in the College of Technology at Purdue University affords me an opportunity to observe that college students in complex technology programs struggle to name standards, unless they are commonplace in the market (e.g., ISO 9000). The process of standards development and the impact of standards on daily life – such as standard credit card size or bar code symbologies – elude them.

From my perspective as both a young professional and an educator, the standards community should and does actively encourage and mentor students and young professionals in the standards arena when given the opportunity. As a faculty member, it is incumbent upon me to encourage students to participate in standards development, thus providing the opportunity for encouragement and mentoring. The motivation for many young professionals to participate is seeing that their work is making a difference.

My own career path excelled due in large part to the involvement of my lab in standards development. After 9/11, biometrics became a mainstream concern. Within the biometrics community, a standardization movement began. The International Committee for Information Technology Standards (INCITS) established Technical Committee (TC) M1 – *Biometrics*, in November 2001 to advocate for comprehensive international biometric standards.

The Purdue University Biometric Standards, Performance and Assurance (BSPA) Lab, founded prior to 9/11, joined the movement to standardize aspects of biometrics technology. For the BSPA Lab's participating faculty and students, INCITS M1 provided a network for engaging with biometrics professionals involved in standardization.

The lab's involvement with INCITS M1 required a considerable investment of time and travel funds. But the return on that investment was significant. Members of the standards community mentored students and



Students and faculty at Purdue University's Biometric Standards, Performance and Assurance Lab

faculty associated with the lab. They provided guidance, persuaded companies and colleagues to donate or provide equipment, and played an active, supportive role in the lab's work.

By 2003, the lab had grown to where its graduate students could become involved in the standards development process, including attending INCITS M1 meetings. Generally, a graduate student's term of only two or three years limits participation in the standards process. However, interacting with biometrics professionals helped students develop professional networks long-term.

In time, the lab increased its involvement to include participating in the International Organization for Standardization (ISO)/IEC Joint Technical Committee (JTC) 1, Subcommittee (SC) 37, *Biometrics*, expanding the opportunities into the international sphere. Not only were students in the lab sitting at the international standards table, but they were assuming the roles of co-editors of technical documents. Work with the standards committees influenced the lab's research, in both specific projects and entire research strands, and the research, in turn, provided information to the standards committees.

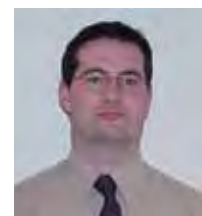
For example, a graduate student worked on an INCITS M1 ad-hoc committee on e-authentication. The ad-hoc committee worked to "investigate and make recommendations regarding how biometrics should be applied in a remote e-authentication environment"

based on the "E-Authentication Guidance for Federal Agencies" document. The committee concluded its work on March 30, 2007, with the graduate student serving as report editor. This activity provided the student with the experience of working with a team of professionals outside of the university lab environment, and gave him the opportunity to participate in developing and publishing a document for use by the biometrics community.

Having since earned his degree, that student now works for an organization that is a member of INCITS M1 (via a connection he made during his M1 work as a student), and he now participates on both ISO/IEC JTC 1 SC 27, *IT Security Techniques*, and SC 37. He is not alone: another former student participates on SC 37, and others are involved tangentially with standards through their workplace activities. These examples show the great benefits of student participation in standards development for the students themselves, their future employers and industry sectors, and the standardization community alike.

Stephen J. Elliott, Ph.D.,

is the head of Purdue University's BSPA Lab. Since joining INCITS M1 - *Biometrics*, in 2001, Dr. Elliott has been committed to educating students on the standards process and the importance of the work done by standards organizations such as the IEC, ISO, the American National Standards Institute (ANSI), and INCITS by incorporating standards development and strategy into university curriculum. He is a member of the ANSI Committee on Education (CoE), serves as project editor for several ISO/IEC JTC 1 SC 37 standards on biometrics, and serves as editor for the ISO/IEC JTC 1 Supplement to the ISO/IEC Directives. ■



Service Robots in Education: A National Strategy to Educate Children

By Philippa Martin-King
Republished from IEC e-tech

In recent years the new category of robot known as the service robot has come into existence. It opens up a whole new world of possibilities for engineers and developers, both in terms of imagination and return on investment. Various Asian economies, already intent on robotic growth, have gone so far as to include the service sector in their strategy plans for national development and government-led initiatives.

What is a service robot?

The service robot, as opposed to the industrial robot, which is used in a manufacturing context, refers to a category of robots developed to assist human beings to carry out repetitive, dull, or even dangerous tasks. The International Service Robot Association (ISRA) defines service robots as “Machines that sense, think, and act to benefit or extend human capabilities and to increase human productivity.” Although the concept of the service robot is relatively new, many predict that, in commercial terms, sales of service robots will quickly overtake those of industrial robots.

Every home will have a robot

In an article published in the January 2007 issue of *Scientific American* (see page 6), Bill Gates predicted that every home would soon have a robot. He was thinking along the lines

of a smart mobile device that would be able to carry out various tasks around the household.

“[The robotics industry] is a highly fragmented industry with few common standards or platforms” he said. “...[It] is developing in much the same way that the computer business did 30 years ago. Think of the manufacturing robots currently used on automobile assembly lines as the equivalent of yesterday’s mainframes. The industry’s niche products include robotic arms that perform surgery, surveillance robots deployed in Iraq and Afghanistan that dispose of roadside bombs, and domestic robots that vacuum the floor. Electronics companies have made robotic toys that can imitate people or dogs or dinosaurs, and hobbyists are anxious to get their hands on the latest version of the Lego robotics system.”

Service robots for cleaning and dismantling...

Indeed, all those categories of robots he described at the time as niche have since become more commonplace and, in some cases, quite widespread. In 2010 there were approximately 200 companies producing or developing service robots on a global basis for industrial tasks such as the dismantling of nuclear power stations, or domestic tasks such as cleaning floors or mowing the lawn.

has particular use. Many dismissed these service robots as being too trivial to be of any economic or commercial importance.

And yet, particularly in Asia, the role of the robot in assisting the young in their learning at nursery schools, or in providing additional information for adults visiting museums and galleries, its use in security applications, medical and household services and so on, is giving direction to a whole new growth of robotic manufacturing.

Endowed with the latest technology

An edutainment robot contains the very latest in electrotechnical wizardry. And all of it is covered by the IEC and the International Standards produced and maintained by its various Technical Committees (TCs) and Subcommittees (SCs): microphone, camera, touch sensors, movement sensors, touch screen, home network connections, stereo speakers, and more.

An edutainment robot can recognize external images through its camera and respond to faces or actions. It can distinguish between different voices and, using various LEDs to express emotion, react with eye, mouth, and facial movements. It can talk through its speakers, play music, give commands, move when it detects an obstacle, or stop and start.

Strategic government plans

Sang-rok Oh is the principal research scientist in robotic (r-) learning at the Cognitive Robotics Center of the Korean Institute of Science and Technology (KAIST), of which he is also vice president. He is leading a special government project set up in January 2010 and funded by the Ministry of Education, Science, and Technology (MEST) to oversee robotics in education. Such is the pace of development of these next generation robots in South Korea, said Sang-rok, that the term *e-learning* has given way to *r-learning*.

Children can see and touch a robotic system, he said. They’re open and *(continued)*

...and edutainment and learning

At first, the far-from-cuddly-looking creatures that many manufacturers produced for the new edutainment market appeared to be more like a hard plastic toy than anything that



More than half of Korea’s kindergartens will have intelligent service robots in their classrooms by 2012.

Service Robots in Education: A National Strategy to Educate Children (continued)

positive about them. They're used to the idea of automatic cleaning systems at home, and they adapt easily to the digital world. Even so, he said, and despite tremendous recent growth, there is still some negative feeling about robots in education. Some people believe that children still need to learn from a natural environment in which computers do not play such a major role.

First attempts were unsuccessful

The first computers that were developed specifically for children with a specially designed keyboard and screen did not produce the results anticipated. With hindsight, it is clear to see that there wasn't enough content available, so when parents bought the system the children quickly got bored with the software that came with it.

According to Sang-rok, this taught

industry and developers the lesson that, in terms of product service components and added value, they need to ensure that there are complementary products available whenever they bring out a new system. One example he cited in this sense is the iPhone. He said that without the servitization aspects of iTunes, it is likely that the system would never have succeeded as it has.

r-learning – a change in paradigm

This change in manufacturing philosophy has brought about a paradigmatic shift in education with the move towards the r-learning system.

In 2010 in South Korea, roughly 1,000 kindergartens were supplied with an intelligent service robot and corresponding software. In 2011 a further 2,000 are being equipped, and in 2012 that figure will rise to 5,000.

This means that more than half of Korea's kindergartens will be involved in the program.

The aim of the system is not merely to provide robots to kindergartens. Rather, it is to provide intelligent service robot hardware along with complementary educational content such as stories and songs. At the same time, the state has put together an education plan designed for the teachers, and has also set up a networked communication system so that the children's parents can themselves monitor behavior and progress.

Teacher support

When the children arrive in the morning, they establish their attendance by talking to the robot. And then all day long, the teacher's lessons and curriculum are complemented by the presence of the robotic system.

In a conventional Korean system, said Sang-rok, the teacher takes a photo and collects materials from all the children. But when the system is adapted to encompass a robot, the children take their own photos and make their own voice recordings. The teacher can then use the material in conjunction with database software to enable the parents to check the digital filing system at a distance, instead of having to be there in person to see their children's results themselves.

Because the educational society in South Korea is somewhat conservative and not particularly open to adopting new systems, the government realized the need for a suitable support structure between the various actors and the robotic industry experts, explained Sang-rok. The South Koreans have set up special sessions for parents and teachers, and they have produced textbooks and competitions to promote the new learning system.

According to Sang-rok, introducing the robotic learning program has freed up time for the teachers to concentrate more on individual children while the robot looks after and supervises the rest of the class – a win-win for everyone. ■

"...Although a few of the robots of tomorrow may resemble the anthropomorphic devices seen in *Star Wars*, most will look nothing like the humanoid C-3PO. In fact, as mobile peripheral devices become more and more common, it may be increasingly difficult to say exactly what a robot is. Because the new machines will be so specialized and ubiquitous – and look so little like the two-legged automatons of science fiction – we probably will not even call them robots. But as these devices become affordable to consumers, they could have just as profound an impact on the way we work, communicate, learn and entertain ourselves as the PC has had over the past 30 years."

– Bill Gates

Published in *Scientific American*, January 2007



To read the full article, visit :

http://www.cs.virginia.edu/~robins/A_Robot_in_Every_Home.pdf

Major U.S. Companies Join White House–Backed Coalition to Stem Engineering Gap

In an effort to stem America’s growing engineering gap and create 6,300 new opportunities for hands-on, technical training in the field, more than 50 U.S. companies, including many from the electrotechnical sector, have joined a coalition of industry leaders committed to doubling the number of engineering internships they will offer in 2012.

The initiative was announced in late August by President Barack Obama’s Council on Jobs and Competitiveness, in partnership with the Business Council, Business Roundtable, U.S. Chamber of Commerce, the National Association of Manufacturers (NAM), and the American Chemistry Council.

“For America to stay competitive in the global market, we must train and retain the world’s best engineers,” said U.S. Secretary of Energy Steven Chu. “Working together, private industry and the public sector can position the U.S. to continue to lead in science and innovation in the 21st century, creating good jobs and laying the foundation for a robust economy.”

Between 1990 and 2010, overall college graduation levels in the U.S. have increased about 50 percent, yet the number of engineering graduates has remained flat at around 120,000 graduates per year. In contrast, roughly 1 million engineers graduate yearly from universities in India and China, putting the U.S. at risk of a significant shortfall in terms of qualified experts in the field.

“I applaud the many members of the standardization community who have joined the coalition and are helping to lead the charge for a stronger, more competitive American workforce,” said American National Standards Institute (ANSI) president and CEO S. Joe Bhatia. “Investing in engineering and standards professionals is absolutely critical to U.S. competitiveness and the future of American jobs.”

President Obama formed the President’s Council on Jobs and Competitiveness in January of 2011 for the purpose of bolstering the United States economy by fostering job creation, innovation, growth, and



competitiveness as the country enters a new phase of economic recovery. The core mission of the Council is to promote growth by investing in American businesses to encourage hiring, to educate and train American workers to compete in the global economy, and to attract the best jobs and businesses in the world to the United States. ■

Participant Companies in the President’s Council on Jobs and Competitiveness Internship Initiative

The following companies have committed to increasing their internship opportunities in 2012, the majority by at least double:

| | | | |
|--------------------------|--------------------------|---|---|
| Alcoa Incorporated | ConAgraFoods Inc. | Longview Fibre Paper and Packaging Inc. | Special Products and Manufacturing Inc. |
| American Express Company | Dell Inc. | Lubrizol Corporation | Sprint Nextel |
| AT&T | Duke Energy Corporation | Mastercard | Suffolk Construction |
| Bayer AG | DuPont | McKesson Corporation | Sungard |
| Bechtel Corporation | Eaton | MeadWestvaco Corporation | Sunoco Inc. |
| BNSF Railway | Facebook | Nalco Company | Symantec |
| Boeing | Fluor Corporation | NextEra Energy Resources, LLC | TE Connectivity, LTD. |
| Broadcom Corporation | FMC Technologies | Nordson Corporation | Tektronix |
| Cardinal Health | General Electric | PCC Structurals Inc. | Texas Instruments Inc. |
| Carus Corporation | Intel Corporation | Power Cubers Inc. | Textron Inc. |
| Caterpillar | Johnson and Johnson Inc. | Simon Property Group Inc. | Thermo Fisher Scientific Inc. |
| Chevron Corporation | JPMorgan Chase & Co. | Spectra Energy Corporation | Xerox Corporation |
| Conductix-Wampfler | Kawasaki Motors, U.S. | | |

USNC Selectees for the 2011 IEC Young Professionals Workshop: In Their Own Words

The USNC is pleased to present the essays submitted by the U.S. winners of the IEC Young Professionals Workshop competition. The workshop will be held in conjunction with the 75th IEC General Meeting in Melbourne, Australia, on October 24-28, 2011. The following two essays were selected for their demonstration of outstanding commitment to representing the United States as future leaders on the IEC global platform. The essay submitted by the third winner, Stephen Elliott, Ph.D., appears within this issue's education-themed section, on page 4.

Sourjo Basu Engineer/Technologist, GE Energy

As an engineer in the smart grid industry, it is clear to me that standardization and technology compatibility will play a crucial role that will have a global impact. Currently, most smart grid technology is partitioned by countries and it is very hard to have a one size fits all approach for most products and services.

Consider the emerging electric vehicle technology. Adoption of electric vehicles in large numbers will greatly benefit the environment, reducing CO₂ levels on an unprecedented scale. It is also crucial to the development of many emerging countries where air pollution is a health hazard. Specifically for the US, it would reduce

our dependence on foreign oil and make us a greener country. A strong charging infrastructure is the biggest obstacle to this solution. Unfortunately, much of the underlying technology to support such infrastructure is not shared across political boundaries. Communication technologies like Wimax, long term evolution (LTE), mesh networks, and programmable logic controller (PLC) all have their individual adopters and naysayers. Sometimes, disagreements over standardization affect the economy and companies like GE by preventing delivery of streamlined solutions.

On a much smaller scale, think of the last time you packed your bag to travel internationally. How many power adapters did you pack to make sure you will be able to power your laptop? Now, bring that into the world of the smart grid and 21st century electrotechnical applications and imagine the complexity that may become prevalent if steps are not taken now to prevent such madness.

During my time spent in standards organizations and working at GE, I have personally seen the intense political maneuvering and behind the scenes efforts made by companies and individuals to sway standards so that it is friendlier to a certain existing or planned product or technology. This results in loss of time and effort

that could have been employed in a more productive manner. Meaningful strategic plans that look decades into the future are discarded by attempts to manipulate standards to the meet the bottom line for the current year.

What American industry needs is a change in its approach to strategic standardization. In the world of standards, there should be collaboration and pooling of shared information and resources to arrive at mutually acceptable solutions. Cut throat competition in standards bodies, while advantageous in the short term for certain companies, will ultimately harm the American economy in the long run by reducing competition and hamstringing innovation.

Change is often driven by young professionals like myself who work from the ground up to build acceptance and consensus, who network and advocate tirelessly to bring real results. We are the champions of future standardization efforts, and it is our involvement in and attitude towards tackling these problems that will determine just how successful American industry will become.

Sourjo Basu joined GE Energy over a year ago and has been very active in the GE Smart Meters division – an integral part of GE Energy's smart grid focus. As a student at Georgia Tech, he became involved in standards activities. He led the Georgia Tech IEEE branch as treasurer, and later as chair from 2004 to 2006. He has been instrumental in advising on meter design and has helped to keep an eye on emerging standards for electric vehicle chargers.

Mr. Basu is a member of the IEEE Power and Energy Society (PES), and serves on the IEEE PES Power System Communications Committee, the IEEE PES Intelligent Grid Coordinating Committee, and the IEEE Steering Committee on Electric Vehicles. He also recently became a member of the project group for IEC 61850-7-420.

Building for Success

The Young Professionals Workshop debuted at the USNC-hosted IEC 2010 General Meeting in Seattle. The inaugural program welcomed 53 young professionals from 27 countries. Ninety-six percent of last year's participants reported their interest in becoming more involved in IEC work as a result of the workshop.



Participants at the 2010 Young Professionals Workshop at IEC 2010 in Seattle

USNC Selectees for the 2011 IEC Young Professionals Workshop: In Their Own Words (continued)

Jonathan Colby

Hydrodynamic Engineer, Verdant Power

As a practicing engineer working in the emerging marine renewable energy industry, the creation of timely and meaningful standards and certifications is of particular interest and importance. The creation of such standards and certifications is essential to encourage the progression of innovative technology from beyond the prototype stage and into commercialization. However, flexibility must be incorporated into the standard and certification development process to allow for the effective implementation of new information and rapidly expanding technology, which is inherent in any developing industry.

For a company in any nascent industry, producing a certifiable product is of particular importance to reduce the inherent risk to potential investors and regulators. As emerging technologies advance beyond the research and design phase into full-scale commercial development, this certification process takes on added importance.

Specifically, “first-ever” commercial installations of technology carry a significant amount of perceived added risk from the viewpoint of insurers, investors and government regulators. This perceived risk can be dramatically reduced if the technology can be “certified” by a third party to perform as specified before implementation. This reduction in perceived risk can lead directly to reduced financial burdens on technology developers as well as increased direct investment into start-up companies. Further, potential regulatory concerns for environmental degradation and/or public health issues, among others, may be mitigated if the design, testing, and manufacturing processes are standardized.

While these standards are critical for emerging technology to succeed, the application of over-restrictive or arcane standards will likely prevent technology development. As such, a dynamic standards development process is essential, one that encourages the rapid inclusion of technology advancements as they develop.

To do so, the standardization community needs to stay abreast of developments within the industry by encouraging participation from a broad range of interests. Specifically, the inclusion of researchers, universities, technology developers and appropriate regulatory

agencies, among others, should help identify and target specific concerns or outstanding issues as they arise.

Further, the standardization process should incorporate regular meetings and frequent document updates during development. This flexibility in the standards development process should guarantee that as concerns and issues change, the standard will follow these changes promptly and modifications will be made appropriately. Additional input from standards committees in mature industries is essential to provide insight and guidance throughout the development process, especially if some technology overlap exists between the industries.

The development of timely standards and a certification scheme for new and emerging technologies is essential for the path to commercialization. By reducing the perceived risk in a new industry through certification, technology developers are more likely to receive the funding, insurance and regulatory approval necessary for expansion.

By maintaining flexibility and broad-based participation, the standards documents and certification processes will be more likely to adequately capture the dynamic nature of emerging technology without inhibiting innovation.

Jonathan Colby is a highly regarded subject matter expert in marine hydrokinetic energy. His technical leadership is recognized and respected by his fellow members of the U.S. Technical Advisory Group (TAG) to IEC Technical Committee (TC) 114, *Marine energy*. His product developments for marine renewable energy are considered noteworthy milestones in the acceleration of this technology. Mr. Colby served as chair for the U.S. Shadow Committee for PT62600-200, *Power Performance Assessment of Electricity Producing Tidal Energy Converters*. ■

Verdant Power’s project in New York’s East River stands as the world’s first grid-connected array of tidal turbines.

Photo: Verdant Power



USNC NEWS

USNC Participates in ANSI's Case Studies Program

The USNC Communications and Continuing Education Committee (C&CEC), under the chairmanship of Jack Wells of Pass and Seymour/LeGrand, has initiated an ongoing dialogue with the American National Standards Institute (ANSI) Committee on Education (CoE) in order to build avenues of communications to academia and the educational community.

As part of this effort, the C&CEC is encouraging the USNC constituency to contribute to the CoE's Case Studies program. The CoE has established a case studies sub-group that is soliciting, collecting, and developing case studies for posting to www.StandardsLearn.org.

On www.StandardsLearn.org, educators and other interested parties will find links to case studies from a variety of disciplines demonstrating where standardization – either the concept or actual practice – helped in the resolution of real-world problems. Instructors can incorporate the case studies into a class discussion of standardization in their discipline, highlighting the economic and/or operational consequences of addressing or not addressing the issues or needs. The advantages and disadvantages of courses of action taken, along with alternatives, can also be discussed.

Currently, the following twelve case studies are posted, with several more in development:

- U.S. Department of Defense: The Virginia-Class Submarine Case Study
- Where There Is Smoke...There Doesn't Have to Be Fire: Fire-Safety and ASTM E2187
- ASTM D6751 and the Zimbabwe Jatropha Program
- Stopping Fires before They Start: NEMA and the Arc Fault Circuit Interrupter Standard
- Canadian Standards Association (CSA): Ensuring Quality Drinking Water
- N42 Series of Radiation Detection Standards – DHS, NIST, and IEEE

- Canadian Standards Association (CSA): Standards Help Fuel Cell Technology Reach Commercial Uses
- Canadian Standards Association (CSA): Standards for Energy Efficiency – International Cooperation, Environmental Goals, and Clothes Washer Standards
- Clinical Device Group: ISO 14155, *Good Clinical Practice for Medical Device Trials*
- Purdue University: Developing a Research Laboratory around Standards Participation
- NEMA: Reliable Images – the DICOM Standard for Medical Imaging
- NEMA: Tamper-Resistant Receptacles – Standards Help Protect Children from Electrical Shock

Requests are also being considered for the development of supplemental presentations, test questions, speakers/experts, and more. The CoE is working to partner with both U.S. and international standards organizations to position ANSI as the de facto U.S. portal to case studies.

The above list could certainly benefit from the addition of electrotechnical case studies related to IEC standards and conformity assessment programs. The C&CEC believes that there are many examples that could be cited and that this is a great mechanism for the USNC to publicize its work and gain visibility within the academic community.

Your participation through the contribution of a case study – even just the key facts or a basic idea would suffice – highlighting the power of standardization in your particular area would be a tremendous help to the growth of this important initiative.

Further Information

The USNC C&CEC encourages you to consider contributing to the ANSI CoE's Case Studies Program. For more information, please contact Lisa Rajchel, secretariat, ANSI CoE, at lrajchel@ansi.org or visit the ANSI CoE website. ■

USNC NEWS

ANSI Site Licenses Support USNC



To obtain the greatest value and convenience for your organization when buying IEC standards, USNC members should consider purchasing a site license from the American National Standards Institute (ANSI). ANSI site licenses enable standards to be shared within a network. They provide real-time access to standards data and offer automatic notification of updates and revisions. And the revenue ANSI receives directly supports the activities and initiatives of the USNC.

The USNC/IEC is a totally integrated committee of ANSI. As such, the Institute provides administrative support to the USNC and its nearly 1,400 participants. ANSI also provides the fiduciary framework by which the USNC's financial obligations are met, including the payment of annual dues to IEC. And since ANSI is a non-profit organization, the revenue earned from your purchase helps to support the programs and services offered to USNC members.

When you purchase a site license from ANSI you are making a commitment to bolster U.S. leadership at the IEC table – and gaining the benefits of easy accessibility, total customization, and affordable pricing for your organization's standards needs.

Further information

Visit webstore.ansi.org/SiteLicense or contact:

- Mark Brown (western territory, 212.642.4935, mbrown@ansi.org)
- Julie Wallace (central territory, 212.642.4949, jwallace@ansi.org)
- Hank Buczynski (eastern territory, 212.642.4942, hbuczynski@ansi.org) ■

USNC NEWS

USNC Leaders Among Recipients of 2011 ANSI Leadership and Service Awards

The American National Standards Institute (ANSI) has announced the recipients of its 2011 Leadership and Service Awards. ANSI will honor the following fourteen distinguished award recipients during a banquet and ceremony to be held on Wednesday evening, October 12, at the Newseum in Washington, DC, in conjunction with World Standards Week 2011.



who has made outstanding contributions to the voluntary standardization community and provided long-term direction and visionary qualities in support of the ANSI Federation.

Diane C. Thompson, president, Thompson Consulting, and editor of *Standards Engineering*, was chosen as the recipient of the **President's Award for Journalism**, which

recognizes a journalist whose work helps to illuminate the role that standardization and conformity assessment activities play in improving the health and safety of Americans and in strengthening the competitiveness of U.S. business in the global marketplace.

E. Clayton Teague, Ph.D., former director, National Nanotechnology Coordinating Office, and former chair, ANSI-accredited U.S. Technical Advisory Group to the International Organization for Standardization Technical Committee 229 on nanotechnologies, was selected as the recipient of the **Chairman's Award**, which honors outstanding accomplishments by any group or individual on behalf of ANSI or the ANSI Federation.

Matthew R. Young, associate, Booz Allen Hamilton, will receive the **Next Generation Award**, which honors individuals who have been engaged in standardization activities for less than eight years and who have demonstrated vision, leadership, dedication, and significant contributions to their chosen field of activity.

Meritorious Service Awards

The following five individuals will receive the Meritorious Service Award in recognition of their outstanding contributions to the U.S. voluntary standardization system:

John G. Abbott, Ph.D., director of regulatory affairs, Philips Healthcare

Jean M. Baronas, consultant, Sony Electronics Inc.

Sonya M. Bird, program manager, international standards, UL

Brian K. Daly, director, core network and government regulatory standards, AT&T

Ramona Saar, program manager, NIST

Further information

For more information, visit www.ansi.org/wsweek. ■

James E. Matthews III, director of technical standards and standards policy, Corning Incorporated, will be awarded the **Astin-Polk International Standards Medal**, which honors distinguished service in promoting trade and understanding among nations through the advancement, development, or administration of international standardization, measurements, or certification.

Robert A. Williams, vice president, standards, Underwriters Laboratories Inc. (UL), will receive the **Howard Coonley Medal**, which recognizes an executive who has benefited the U.S. economy through voluntary standardization and conformity assessment and has given outstanding support to standardization as a management tool.

Richard DeBlasio, chief engineer, National Renewable Energy Laboratory, will receive the **Finegan Standards Medal**, which honors an individual who has shown extraordinary leadership in the development and application of voluntary standards.

Keith A. Mowry, manager of accreditation services, UL, will receive the **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 confidence in standards compliance for the marketplace.

Ralph M. Showers, Ph.D., emeritus professor of electrical engineering, University of Pennsylvania, will be awarded the **Elihu Thomson Electrotechnology Medal**, which honors an individual who has contributed in an exceptional, dedicated way to the field of electrotechnology standardization, conformity assessment, and related activities at the national and international levels.

Mary H. Saunders, director, standards coordination office, National Institute of Standards and Technology (NIST), will receive the **George S. Wham Leadership Medal**, which honors an individual

LATEST FROM THE IEC

Update on IEC TC 64: *Electrical Installations and Protection against Electric Shock*

By Mark W. Earley, Chief Electrical Engineer,
National Fire Protection Association

IEC Technical Committee (TC) 64, *Electrical Installations and Protection against Electric Shock*, has made progress on the following agenda items in recent months:

IEC SMB direction to address smart grid

TC 64's response to the Standardization Management Board (SMB) is to establish a Working Group (WG) or ad-hoc group (AHG), as suggested by the U.S., to investigate the possible impact of a smart grid supply to an electrical installation. The U.S. needs to identify a U.S. expert to participate.

Defining "auxiliary circuits"

This is of concern to the TC 64 Technical Advisory Group (TAG) because it could potentially codify the implication contained in a note for IEC 60364-5-53, clause 531.2, that has been used to impose installation use restrictions on U.S.-style residual current devices (RCD)/ground fault circuit interrupters. The U.S. must closely follow this activity and work to achieve a definition that helps eliminate that negative impact. A decision was made to close the 557 Ad-Hoc Group (AHG) and assign the work to Maintenance Team (MT) 3. The document will be reissued as a Committee Draft for Voting (CDV).

AHG for IEC 60364-5-53

The current (1994) edition of part 53 is dated, and an update has been stalled for over a decade due to the efforts by U.S.-style RCD countries to eliminate the note referenced above. The AHG was charged with attempting to define the way forward for MT 22 to accomplish the maintenance on Part 53. Document 64/1785/INF was a report from the Chairman's Advisory Committee on a way to move forward on the maintenance of Part 53. The essence of the recommendations was to split part 53 into sub-parts so that work can progress. The concern expressed by the U.S. was that this method could enable the requirement causing problems for RCDs

to remain and not get resolved. It was the chairman's contention that the MTs will be pushed to achieve consensus so that voting will allow the work to proceed.

Negative votes on the CDV for Amendment 1 to IEC 60364-7-709

There were discussions on whether it would be appropriate to further reduce the outlet current rating where "protection" by a 300 milliamper (mA) RCD would be permitted. After addressing several points of concern, it was decided that the Final Draft International Standard (FDIS) should be issued with the same current rating break point as was in the Committee Draft for Vote (CDV).

IEC 60364-7-722

Supply of electric vehicles is a new activity for TC 64, so discussion has been on the acceptance of the project. The committee decided to pursue a liaison with International Organization for Standardization (ISO) TC 22 for cooperation in work on electric vehicle supply. TC 64 already works with IEC TC 69 and TC 23. It was decided to consider liaison with SC 17D because of work on 61439-7 that includes requirements for EV charging stations. There is a committee draft (CD) in process that will be circulated when it becomes available.

Questions on DC circuits

This activity is intended to define device selection installation requirements and

personnel protection for direct current (DC) circuits. It could lead to requirements for RCDs able to sense and interrupt low-voltage (LV) DC. There were two reports available: 64/1757/INF and 64/1759/INF. Both documents feature color coded charts indicating how current RCD technology reacts to faults on the AC and DC sides of circuits in various configurations. Additional IEC work may be needed in the future. The protection levels may exceed values that are considered acceptable in the United States.

Faults on neutrals and effect on RCDs

This involves another area potentially affecting RCDs and the requirements for selection based on their classification and characteristics. The plenary discussed papers from the U.S. and the Netherlands. The conclusions were that the RCD should trip when equipment is energized due to a fault on the neutral causing current differential. This is happening without a person in contact with the enclosure of a device. It was also pointed out that the situations all involve multiple faults, where IEC policy is to address only single faults. A small group of TC 64 leadership concluded that the proposals concerning second grounded neutral are not to be addressed by TC 64, primarily because of the policy of developing requirements that address only a single fault. It was determined that the U.S. situation is essentially 3 faults. This creates a "catch 22" situation, because introducing multiple fault consideration, particularly in 60364-4-41, opens the door to other situations that we fought against during previous attempts to put restrictions on Voltage Dependent RCDs. The U.S. and the Netherlands did not have a good argument against this logic, and thus the decision was to send 64/1757/INF as the TC 64 response to SC2 3E. The deleted text (the removal of the words "not realistic and") is courtesy of Reinhard Hirtler of Australia based on some sympathy for our cause. ■



Standards Boost Business Campaign Gives U.S. Companies Competitive Edge

To raise awareness of the strategic and economic value of standards to U.S. business, the American National Standards Institute (ANSI) and twenty-six partners across the standardization community have launched Standards Boost Business (SBB), an outreach initiative to help corporate America harness the power of standards and conformance to boost business performance and gain a foothold over the global competition.

“Those who understand how to effectively influence and address standardization and compliance issues have the greatest success in the global marketplace,” said S. Joe Bhatia, president and CEO of ANSI. “An executive has a critical choice to make in today’s economy: position your organization to take a



seat at the table and be part of the standards-setting process, or to let your competitors dictate the way you will be doing business.”

The Standards Boost Business campaign is a call to action for corporate America to invest resources in the standardization system, and gain its rewards. The campaign seeks to raise understanding among C-suite

executives and other corporate leaders of how the U.S. voluntary standards system drives business growth, spurs innovation, and advances U.S. competitiveness.

Through real-world case studies and other resources, the SBB website showcases how companies and organizations have streamlined processes, reduced costs, won market access, and boosted their bottom line by participating in standards development activities and implementing standards and conformance tools.

SBB Sponsoring Organizations

To date, sponsoring partners of the Standards Boost Business campaign include:

- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)
- American Society of Mechanical Engineers (ASME)
- ASIS International
- Association for the Advancement of Medical Instrumentation (AAMI)
- Association of Home Appliance Manufacturers (AHAM)
- ASTM International
- The Boeing Company
- Consumer Electronics Association (CEA)
- IEEE Standards Association
- International Association of Plumbing and Mechanical Officials (IAPMO)
- International Code Council (ICC)
- National Electrical Manufacturers Association (NEMA)
 - Connector Manufacturing Company
 - Eaton Electrical, Inc.
 - Emerson Industrial Automation
 - Hubbell Electrical Systems
- National Fire Protection Association (NFPA)
- NSF International
- SAE International
- Safety Equipment Institute (SEI)
- Schneider Electric
- SES – The Society for Standards Professionals
- Security Industry Association (SIA)
- Telecommunications Industry Association (TIA)
- Thomas & Betts Corporation
- U.S. Pharmacopeial Convention
- UL (Underwriters Laboratories)

Further Information

Visit www.standardsboostbusiness.org. ■

LAUGH TRACK

Top 5 Reasons for Attending Engineering School

- You wanted everyone to think you were smart.
- You went to the wrong room during orientation.
- You had a strange desire to graduate with a low GPA.
- If you flunked out, there’s always the business school.
- You’ve always wanted to drive a train.

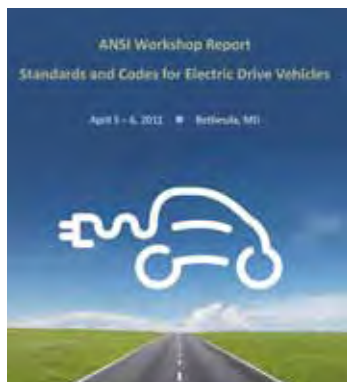


ON THE GRID

SAVE THE DATES

ANSI Releases Report on Standards Needed to Support Electric Vehicles in the United States

The American National Standards Institute (ANSI) has submitted to the U.S. Department of Energy (DOE) a report outlining priority areas where standards and conformance activities are needed to facilitate the safe, effective, and large-scale deployment of electric drive vehicles (EDV) in the United States.



Participants agreed that a standardization roadmap for North America would help to establish priorities for the work that needs to be done. A matrix of the various coordinating bodies and standards activities would also help stakeholders to navigate the various activities taking place and facilitate

global harmonization.

The report details findings from the April 2011 ANSI Workshop, *Standards and Codes for Electric Drive Vehicles*, which ANSI convened on behalf of DOE and the Idaho National Laboratory. Nearly 120 stakeholders and another 30 webinar attendees examined the standards, codes, conformance programs, and education initiatives needed to drive the widespread deployment of EDVs in support of President Barack Obama’s goal to have one million electric vehicles on U.S. roads by 2015.

According to the *ANSI Workshop Report: Standards and Codes for Electric Drive Vehicles*, the issues of safety and consumer confidence – and the conformance and training programs needed to support them – are key priorities for the widespread acceptance of EDVs and the continued growth of the market. The overarching conclusion of the April workshop was a call for better coordination and harmonization of standardization efforts, and for a public-private partnership to move this work forward quickly and effectively.

To offer a neutral forum where public and private sector stakeholders can work cooperatively toward solutions that will help build the market for EDVs, ANSI formed the Electric Vehicles Standards Panel (EVSP) in March 2011. The goal of the EVSP is to produce a strategic roadmap by year’s end that will define the standards and conformity assessment programs that are needed to support this major shift in our national automotive landscape. The EVSP began the groundwork for the standardization roadmap at its plenary meeting on June 20-21 in Detroit. The *ANSI Workshop Report: Standards and Codes for Electric Drive Vehicles* will serve as a key input document to the continued efforts of the EVSP.

Further Information

The full workshop report, as well as the speaker presentations and webinar recordings of the April 5-6 workshop, are available at www.ansi.org/edv. ■

Upcoming Meetings & Events



SEPTEMBER 2011

FINCA Meeting
September 28 – 29, 2011
Mexico City

OCTOBER 2011

ANSI World Standards Week
October 11 – 14, 2011
Washington, DC

| | |
|--|------------|
| ANSI-ESO Conference | October 12 |
| ANSI Awards Banquet | October 12 |
| ANSI Member Forums | October 13 |
| ANSI Legal Issues Forums | October 13 |
| Annual Business Luncheon | October 13 |
| U.S. Celebration of World Standards Day Dinner | October 13 |
| U.S. Celebration of WSD Capitol Hill Event | October 14 |

75th IEC General Meeting

October 24 – 28, 2011
Melbourne, Australia

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|-----------------|------------|
| SMB Meeting | October 24 |
| CAB Meeting | October 25 |
| Council Board | October 26 |
| Council Meeting | October 28 |

IEC Young Professionals Workshop

October 24 – 26, 2011
Melbourne, Australia

For more event information, visit www.ansi.org/calendar and enter “USNC” or “IEC” in the key word search field.



Published in ANSI’s NYC Office
25 West 43rd Street
Fourth Floor
New York, NY 10036
www.ansi.org

ABOUT THIS PUBLICATION

The USNC *News and Notes* newsletter is distributed to the constituency of the United States 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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HOW TO CONTRIBUTE

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