

## 1.0 Background for Workshop

Coordination of standards development in the U.S. benefits the public, government, and industry. The topic of conflict and duplication in standards is not new and has once again become a point of discussion and debate among various constituencies.

A workshop organized by the American National Standards Institute (ANSI) with the support of the National Institute of Standards and Technology (NIST), *Standards Wars: Myth or Reality?*, brought together a broad range of stakeholders to share their views and insights on standards development, coordination, and competition. The workshop, which took place May 12, 2011, in Washington, DC, was attended by over 200 in-person participants and over 70 more via a live teleconference, representing government, industry, standards developing organizations (SDOs), conformity assessment bodies, consortia, academia, consumers, and other interested stakeholders. More than 1,000 individuals also followed the proceedings via Twitter using the hashtag #standardswars.

This day-long workshop took a panel-based approach to discussing competition, convergence, and coordination in different areas of standards development. During these discussions, attendees uncovered instances where conflict and duplication in standards development have been intentional in response to stakeholder needs, and unintentional due to lack of awareness of existing standardization efforts. Workshop attendees also discussed tools to identify potentially conflicting and duplicative standards projects as early as possible in their development, including NSSN ([www.nssn.org](http://www.nssn.org)), the search engine for standards, which is currently under redevelopment.

## 2.0 Report Format and Acknowledgements

The workshop provided attendees with an opportunity to understand the various constituencies that are impacted by standards development, including users of standards, standards developing organizations (SDOs) and consortia, and specifiers of standards. Following this introductory information, the discussion then centered on three focused panels with audience participation, an overview of the plans for future enhancement of the NSSN, and a summary discussion. Each of these components of the workshop is addressed briefly in this report, organized in accordance with the agenda, which is provided in Appendix 1. Representatives from a range of interested stakeholder groups participated in the workshop; a complete list of in-person attendees is available in Appendix 2. Workshop-related presentations are available at [www.ansi.org/standardswars](http://www.ansi.org/standardswars).

Recognition and sincere appreciation are due to the following:

- NIST, for its support of this activity and its many contributions to advancing dialogue and solutions related to this topic, especially Ms. Mary Saunders and Mr. Gordon Gillerman.
- Mr. Jim Pauley, senior vice president, external affairs and government relations, Schneider Electric, for moderating the workshop, facilitating discussions and bringing his unique perspective to the day.

- Ms. Fran Schrotter, senior vice president and COO of ANSI, for her introductory remarks and leadership.
- Mr. Lane Hallenbeck, vice president of accreditation services at ANSI, for his leadership.
- The moderators from each of the panels for their effective role in facilitating the sessions, including Mr. Jim Pauley; Mr. Neil Bogatz, International Association of Plumbing and Mechanical Officials (IAPMO); and Mr. Gordon Gillerman.
- All of the panelists listed on the agenda for sharing their expertise and introducing key ideas and concepts utilized during the open dialogue sessions.

### 3.0 Opening Remarks

Fran Schrotter, senior vice president and COO of ANSI, opened the workshop by reviewing ANSI's role and mission as a non-profit organization that coordinates the U.S. private sector standards and conformance system. She noted that ANSI works with its diverse members and all stakeholders to bring about cross-sector, market-driven, standards-based solutions that are characterized by consensus, openness, and balance. These are the very principles that the U.S. voluntary standardization system is based on and they are the same principles that were applied to the organization and management of the workshop.

She noted that the workshop was intended to continue an important conversation that has been ongoing since at least the 1970s: a conversation about how – and whether – conflict and duplication should be addressed in the standards and conformance world.

For years, the issues of competition, convergence, and coordination have been hotly debated within the standards and conformance community. There are many players but two prevailing schools of thought:

Number one: There are simply too many standards out there. Many of them are duplicative, and some are even conflicting in their specifications. Too many standards really means that there is no standard.

And number two: Standards developers and consortia work to meet marketplace needs. If there are multiple standards in a given area, that is because there is a demand for multiple standards-based solutions. Multiple standards indicate a healthy and competitive environment.

ANSI recognizes the critical role that well-coordinated standards development activities play in our national economy. In an effort to share information about how market forces impact different areas of standards development, the workshop was convened to provide an open and constructive mechanism through which different viewpoints could be raised and discussed.

She emphasized that all participants in the standardization system are players in this dialogue. The workshop's discussion surrounded standards and conformance in the broadest sense and not solely the

part of the system represented by American National Standards (ANS) and ANSI-accredited standards developers (ASDs).

Ms. Schrotter asked the participants to consider the following questions during the workshop:

- Is there such a thing as too many standards?
- Should any entity have the ability to limit the number of standards that address a particular topic?
- For that matter, should any entity be able to prevent a standards developer from working in an area that some might argue is already fully addressed by existing standards?
- And finally, is competition tolerated in some industry sectors but not others?

Participants were invited to learn about different perspectives on conflict and duplication in the standards arena so that going forward, stakeholders will have a better appreciation of various viewpoints.

## 4.0 Panel 1: Users of Standards

The first panel was a facilitated discussion by Jim Pauley with users of standards, including industry, consumers, government purchasers, and attorneys. This panel considered different perspectives on whether the existence of multiple standards matters, how standards are selected, and whether the source of the standard matters.

### Multiple Standards Represent Choice

Many in the information and communications technology (ICT) industry see multiple standards as a choice among different technical solutions and formats. Amy Marasco of Microsoft noted that it can be hard to define conflict and duplication versus what may instead be termed choice in the marketplace, with the stakeholders and end users ultimately deciding which solution is best. From the federal government perspective, panelists recognized that multiple standards solutions exist and are a reflection of the entrepreneurial nature of the economy. This concept was further echoed by members of each of the panels that followed.

The concept of policing and/or structuring the standards system to preclude the possibility of competing or duplicative standards is viewed by many as one that would unnecessarily hinder innovation.

### Factors Informing Standards Selection

Panelists acknowledged the value of the important support given to the U.S. voluntary consensus standards development process by OMB Circular A-119,<sup>1</sup> which encourages federal government reliance on voluntary consensus standards. Panelists noted that federal government procurement practices rely on a range of standards, including industry standards, voluntary consensus standards, and others that

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<sup>1</sup> OMB A-119, *Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities* ([http://www.whitehouse.gov/omb/circulars\\_a119/](http://www.whitehouse.gov/omb/circulars_a119/)).

meet specified needs. Where more than one solution is viable, having a choice among standards is not viewed as a problem from a procurement perspective. However, some felt that if there are conflicting standards among the options then it could be more challenging to rely upon standards to help meet national priorities.

Panelists and attendees next turned their attention to whether selecting a standard takes into account the “process” of the standard’s development. The panelists agreed that the best process does not necessarily produce the best content; however, the principles embodied in OMB A-119 – openness, consensus, balanced participation, and due process – are important considerations nonetheless. Participants also acknowledged that in any given standards development process, stakeholders may “vote with their feet” if a particular standards process is unsatisfactory and that such action does send a signal to the marketplace. In some instances, this may be the most efficient way to sort through multiple standards efforts. The role of consumers in this context was discussed as well by Don Mays of Consumers Union, which monitors the effectiveness of existing standards and works to improve them on behalf of consumers.

### **Who Judges What Is Duplicative?**

ANSI serves an important role in fostering collaboration and has done a lot to facilitate discussions on this issue, but some participants asserted that the Institute should not be put in the position of jury to decide whether standards are duplicative or conflicting, nor should ANSI force standards developers to act one way or another. While some disagree with this perspective, many acknowledged that the best standards are those that are effective and used – and that such decisions are best made by the marketplace.

Some participants expressed a view that there is an unnecessary proliferation of standards developers. While this was acknowledged as true by most, it was also recognized that many forces contribute to this phenomenon, including the competitive and entrepreneurial nature of the U.S. market, which routinely gives rise to new consortia that aim to address emerging technology areas.

## **5.0 Panel 2: Standards Developers**

The second panel was led by Neil Bogatz of the International Association of Plumbing and Mechanical Officials (IAPMO) and offered the perspective of standards developing organizations (SDOs), including ANSI-accredited standards developers and consortia. Drivers for initiating a standards development project were discussed alongside coordination with other SDOs working on standards that address the same subject matter. Panelists also addressed how consideration is given – or not given – to potential conflict or duplication with existing standardization activities when undertaking new work.

### **Multiple Standards**

Andy Updegrave of Gesmer Updegrave, LLP, provided insight into the world of consortia, emphasizing

that almost every week there is a new body developing ICT standards. Consortia are formed by U.S. companies to achieve strategic objectives. They identify a unique interest of value to them – and by extension, of value to the U.S. economy – and they form an entity to address their interest. Mr. Updegrave added that developers have an obligation to the market to create useful standards, and those will be the ones widely adopted.

Many of the panelists felt that the marketplace chooses the standards. Industry can and should participate in their development, but ultimately the standard will be decided by the market. In addition, even if the U.S. addresses the issue of multiple standards, there will still be competition and multiple standards in the global system.

SDO panelists remarked that, in general, they try to avoid unnecessary conflict and duplication, but sometimes there is a compelling need for more than one standard, which translates into different or overlapping content. For example, different stakeholder groups may want different things from a standard, which simply could not be addressed by a single document. Good faith efforts to address related concerns are important, but in the end, panelists acknowledged that the market will decide which standards project will succeed and if more than one has value. In the healthcare industry, for example, Ms. Gilbertson noted that SDOs are trying to harmonize standards, but cannot do that well if the problem that requires a solution is not well defined or if stakeholders disagree on its definition. Specificity can be important to successful harmonization.

## Coherence

Ms. Morgan asked the audience to contemplate how we can enhance a proven and successful U.S. standardization system. One suggestion is to continue to advocate for coherence in the global standards system and consider adding the concept to the *ANSI Essential Requirements*.<sup>2</sup> She noted that coherence is everyone's responsibility and reaches beyond U.S. standardization activities. Avoidance of redundancy and duplication, not starting an activity when one exists, not replicating a viable standard – all of these actions would minimize confusion in the marketplace and the duplication of resources. Ms. Karen Higginbottom from ISO/IEC Joint Technical Committee (JTC) 1 shed some more light into the ICT perspective, stressing the importance of reaching out to and collaborating with the many different standardization efforts competing in the marketplace.

## Global Database

All agreed that a global standards database with up-to-date information provided by all developers would be a useful tool in facilitating coherence and avoiding unnecessary duplication in the range of standards development contexts. Ms. Claire Ramspeck of ASHRAE pointed out that such a tool will facilitate discussions among and between stakeholders, users, and standards developers. To this end, the NSSN

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<sup>2</sup> *ANSI Essential Requirements: Due process requirements for American National Standards* is the document that governs the American National Standards process. As such, its reach is limited to American National Standards only. ([www.ansi.org/essentialrequirements](http://www.ansi.org/essentialrequirements))

standards database is being further developed and enhanced, and its improvements should be well publicized to foster greater usage. ANSI is currently at work on this upgrade, as was discussed by Bob Hager (see Section 6.0 NSSN Overview). The panelists also stated that the database should contain not only ANS data, but also consortia and other SDO data.

## 6.0 Panel 3: Specifiers of Standards

The final panel presented the perspectives of specifiers of standards, including those involved in regulation and procurement. NIST's Gordon Gillerman moderated a discussion on how standards are chosen for government programs, participation in standards development, and duplication as related to standards enforced by law or regulation. He noted that attendees should leave the day's session with a respect for alternative points of view and a desire to achieve a balance in the way we talk about the issues of conflict and duplication as we move forward.

### Standards Selection

In describing her work with the U.S. Department of Energy's Superior Energy Performance (SEP) program, Ms. Aimee McKane of the Lawrence Berkeley National Laboratory stressed that the program relies upon both national and international standards as well as ANSI accreditation to assess conformance to those standards. This project is an example of a successful public-private sector initiative involving reliance on voluntary consensus standards and harmonization – both domestic and international – without the intention of regulation. That said, the issue of the intersection of standards and regulations is an important one.

Mr. Bill Dupler provided insight into the code creation process of Chesterfield County, Virginia, explaining that in choosing standards sometimes only one standard is needed, while in other instances multiple standards are a benefit. The benefits of harmonization in the code arena include familiarity with a common framework and a reduced cost burden. Mr. Scott Colburn of the FDA agreed, noting the importance within the FDA of transparency and consensus with respect to standards selection.

Following earlier expressed themes, the panel felt that as a tool for deploying a particular technology or assisting a national priority, a federal agency does indeed look for the best standard.

### Conflict and Duplication

Dr. Mary McKiel of the U.S. Environmental Protection Agency explained that government procurement is handled on a program-by-program basis, with a variety of approaches even within one agency. What is less important than whether there are conflicting standards is whether standards exist that will achieve an articulated goal. Dr. McKiel and Mr. Gillerman agreed that a systems engineering approach considering multiple paths is most useful.

This panel also recognized that the existence of multiple standards efforts requires the expenditure of

greater resources. While this may be an acceptable cost in some sectors, in others it can be a drain.

## 7.0 NSSN Overview ([www.nssn.org](http://www.nssn.org))

Bob Hager, ANSI senior director of publishing and production, provided an overview of the current NSSN, what the new NSSN will contain, how it will support this effort, and what the next steps will be.

NSSN is a search engine for standards that was originally launched in 1996 with a significant upgrade in 2003. It contains information on published and in-development standards with over 330,000 records from 325 standards development organizations. Currently there are extensive data update mechanisms in place, but limited search options, a limited number of data elements available for search and display, and a limited number of in-development records outside of ANS.

In the long-term, the goal of the enhanced NSSN is to facilitate discovery of and potential for coordination of related standards development projects across a broader range of organizations, processes, and data sets – and as early in the development cycle as possible. This will increase the possibility of productive discussions and perhaps the formation of collaborative relationships, as well as foster broader participation in standards development. In addition, it will improve ANS data retrieval and presentation, making better search and filtering capability within this context possible.

A more robust, advanced search with a new dynamic filtering of the results is also planned. ANSI hopes to include non-ANS development data which will include a broader set of standards development organizations, including consortia. It will also include development data mapping in order to maximize the alignment of conceptually similar stages of development to allow for easier comparison.

This enhanced system will be integrated with ANSI's new web platform, which is under development, to provide a consistent online presence across all sites. The first phase of deployment is scheduled for the fourth quarter of 2011.

ANSI plans to gather input from this workshop to inform future development work. It will reach out to establish new data exchange relationships, explore ways to standardize data exchange, and analyze and begin to develop conceptual mapping of varied development processes. ANSI is also planning a 2012 workshop to review the data exchange efforts and the status of NSSN platform refinements, with deployment targeted for 2013.

## 8.0 Closing Remarks and Next Steps

Moderator Jim Pauley closed the workshop by recapping some of the key points raised during the day's sessions. He noted that while attendees did not expect to end the debate about the implications of conflict and duplication in the standards world, the goal of providing an open and constructive mechanism through which different viewpoints could be raised and debated was achieved.

While conflict and duplication in standards development are deserving of continual review, the U.S. voluntary consensus standardization system is strong, effective, and responsive to the country's needs. As a result of the workshop, stakeholders gained a better understanding of the range of perspectives that are brought to the table when someone raises the issue of whether there are too many standards. Participants also explored whether any entity should have the ability to limit the number of standards that address a particular topic or prevent one standards developer from working in an area that some might argue is already fully addressed by existing standards and standards developers.

During the workshop it became apparent that some stakeholders clearly believe that multiple standards in a given market reflect a healthy and competitive environment, while others maintain that too many standards really means that there is no standard and so the system is broken. Sector-specific needs were also highlighted, particularly in the ICT space. Many acknowledged that competition is fine in one or a limited number of sectors or in relation to one type of standard, but cannot so easily be tolerated in other areas.

One shared perspective is that easily accessible and widely available data about published standards and standards under development will improve the likelihood that productive conversations among those working on similar projects will take place. But data alone will not result in a more efficient standards marketplace. As one speaker noted, coherency is the collective responsibility of the global standards community. All participants and all standards developers are encouraged to be open to hearing different viewpoints, to make good faith efforts to harmonize or collaborate when appropriate, and to utilize limited resources efficiently to ensure the continued health and strength of the U.S. voluntary consensus standards system.

## **Next Steps**

Two additional workshops are planned and will be held during the next 18 months. More focused in scope, these workshops will explore the enhanced NSSN and its use.







**Standards Wars: Myth or Reality?**

*How the forces of competition, convergence, and coordination impact standards development*

**AGENDA**

Thursday, May 12, 2011 | 10:00 a.m. – 5:00 p.m.

Grand Hyatt Washington, 1000 H Street NW, Washington, DC

| Time                      | Topic  | Speaker  |
|---------------------------|--|--|
| 8:30 a.m.                 | <b>Registration / Networking Breakfast</b>   |  |
| 10:00 a.m.-<br>10:15 a.m. | <b>Welcome and Opening Remarks</b>   | <b>Fran Schrotter,</b><br>ANSI Senior Vice President<br>and Chief Operating Officer  |
| 10:15 a.m.-<br>10:30 a.m. | <b>Introduction of Moderator</b><br>Moderator Remarks<br><br><i>Perspectives of the three constituencies of standards: users, specifiers, and standards developers define conflict and duplication and how they defend (or not) against it.</i>  | <b>Jim Pauley,</b><br>Senior Vice President,<br>External Affairs and<br>Government Relations,<br><b>Schneider Electric; member,</b><br>ANSI Board of Directors   |
| 10:30 a.m.-<br>12:00 p.m. | <b>Users of Standards</b><br>(Industry, Consumers, Government Purchasers, Conformity Assessment Bodies)<br><br><i>Questions for the Panel:</i> <ul style="list-style-type: none"> <li>▪ Does the existence of multiple standards matter?</li> <li>▪ On what basis is a standard selected?</li> <li>▪ Are there areas where conflicts can be less tolerated versus more tolerated (i.e., product specifications versus safety)?</li> <li>▪ Does every standard have to have the same level or status, or does the market sort that out?</li> </ul> <p>The Panel’s discussion will be followed by a 30-minute Q&amp;A session.</p> | <b>Facilitator</b><br><b>Jim Pauley</b><br><br><b>Panelists</b><br><b>Don Mays,</b><br><b>Consumers Union</b><br><br><b>Amy Marasco, Microsoft</b><br><br><b>Marty Strauss, Consultant</b><br><br><b>Mary Saunders, National Institute of Standards and Technology (NIST)</b><br><br><b>Jamie Carroll,</b><br><b>JBC Law Group</b> |

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|--------------------------|---|--|
| 12:00 p.m.-<br>1:00 p.m. | <p><b>Lunch</b><br/>Networking lunch</p>  |  |
| 1:00 p.m.-<br>2:30 p.m.  | <p><b>Standards Developers</b><br/>(Accredited Standards Developers, Consortia)</p> <p><i>Questions for the Panel:</i></p> <ul style="list-style-type: none"> <li>▪ What are the drivers for developing a standard?</li> <li>▪ Does it matter that others are in the space?</li> <li>▪ If coordination is a goal, how is it achieved?</li> <li>▪ Is duplication of standards ever desirable?</li> </ul> <p>The Panel’s discussion will be followed by a 30-minute Q&amp;A session.</p>  | <p><b>Facilitator</b><br/>Neil Bogatz, International Association of Plumbing and Mechanical Officials (IAPMO)</p> <p><b>Panelists</b><br/>Kathie Morgan, ASTM International</p> <p>Claire Ramspeck, ASHRAE</p> <p>Andy Updegrove, Gesmer Updegrove LLP</p> <p>Lynne Gilbertson, National Council for Prescription Drug Programs (NCPDP)</p> <p>Karen Higginbottom, ISO/IEC JTC 1</p> |
| 2:30 p.m.-<br>4:00 p.m.  | <p><b>Specifiers of Standards</b><br/>(Regulators/Government, Procurement)</p> <p><i>Questions for the Panel:</i></p> <ul style="list-style-type: none"> <li>▪ How do you choose standards on which to base programs?</li> <li>▪ Do you participate in the development and if so, are issues of conflict and duplication relevant to your participation?</li> <li>▪ When is it desirable to have one standard and when is it desirable to have more than one?</li> <li>▪ When standards are enforced (by law/regulators), what issues result when multiple standards are created on the same topic?</li> </ul> <p>The Panel’s discussion will be followed by a 30-minute Q&amp;A session.</p> | <p><b>Facilitator</b><br/>Gordon Gillerman, NIST</p> <p><b>Panelists</b><br/>Mary McKiel, U.S. Environmental Protection Agency</p> <p>Aimee T. McKane, Lawrence Berkeley National Laboratory</p> <p>Bill Dupler, Building Official, County of Chesterfield, VA</p> <p>Scott Colburn, U.S. Food and Drug Administration</p>   |

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|-------------------------|--|------------------------|
| 4:00 p.m.-<br>4:45 p.m. | <p><b>NSSN Overview</b></p> <p>The NSSN: A National Resource for Global Standards is a search engine that provides users with standards-related information from a wide range of developers, including organizations accredited by ANSI, other U.S. private sector standards bodies, government agencies, and international organizations. ANSI, with NIST’s support, is working to enhance the breadth and accessibility of the NSSN’s standards data to facilitate coordination and as a general tool for all stakeholders.</p> <p>The presentation will be followed by a brief Q&amp;A session.</p> | <b>Bob Hager, ANSI</b> |
| 4:45 p.m.-<br>5:00 p.m. | <p><b>Facilitated Discussion</b></p> <ul style="list-style-type: none"> <li>▪ Next Steps</li> <li>▪ Workshop Report</li> </ul>   | <b>Jim Pauley</b>      |
| 5:00 p.m.               | <b>Adjournment</b>   | <b>Jim Pauley</b>      |

**May 12, 2011**  
**Standards Wars Workshop Participants**

| Last Name   | First Name  | Organization   | Participation |
|-------------|-------------|--|---------------|
| Abbate      | Danny       | Air-Conditioning, Heating and Refrigeration Institute                | In-Person     |
| Abelson     | Donald      | Sudbury International LLC  | In-Person     |
| Ambrosius   | Teresa      | American Petroleum Institute   | In-Person     |
| Baldwin     | Cheryl      | Green Seal Inc.  | In-Person     |
| Barrett     | Amy         | American Institute of Aeronautics and Astronautics                   | In-Person     |
| Bart        | Dan         | Valley View Corporation  | In-Person     |
| Belt        | Bill        | Consumer Electronics Association                                     | In-Person     |
| Benigni     | Dan         | NIST – U.S. Department of Commerce                                   | In-Person     |
| Berger      | Paula       | Paula Berger Consulting  | In-Person     |
| Berger      | William     | American Society of Mechanical Engineers                             | In-Person     |
| Best        | Karl        | Project Management Institute   | In-Person     |
| Bhopti      | Rustom      | B System Compliant LLC   | In-Person     |
| Bieber      | George      | U.S. Department of Defense Defensewide Information Assurance Program | In-Person     |
| Bittner     | Patricia    | Consumer Product Safety Commission                                   | In-Person     |
| Bodden      | Martha      | Noblis   | In-Person     |
| Boesenberg  | Alex        | National Electrical Manufacturers Association                        | In-Person     |
| Bogatz      | Neil        | International Association of Plumbing & Mechanical Officials         | In-Person     |
| Borishade   | James       | Association for Challenge Course Technology                          | In-Person     |
| Boyles      | Michael     | U.S. Department of Commerce - ITA Office of Multilateral Affairs     | In-Person     |
| Brown       | Samuel      | Environmental Protection Agency                                      | In-Person     |
| Burakowski  | Tracy       | Kavi Corporation   | In-Person     |
| Busch       | Lawrence    | Michigan State University  | In-Person     |
| Button      | John        | SRA  | In-Person     |
| Cade        | Greg        | National Fire Protection Association                                 | In-Person     |
| Caldas      | Anne        | American National Standards Institute                                | In-Person     |
| Cantrell    | Rick        | Sustainable Forestry Initiative, Inc.                                | In-Person     |
| Carioti     | Susan       | ASIS International   | In-Person     |
| Carnahan    | Christopher | Aerospace Industries Association                                     | In-Person     |
| Carroll     | Jameson     | JBC Law Group LLC  | In-Person     |
| Carroll     | Stephanie   | American National Standards Institute                                | In-Person     |
| Carter      | Catherine   | American Board for Certification                                     | In-Person     |
| Chatterjee  | Asok        | Ericsson Inc   | In-Person     |
| Colburn     | Scott       | U.S. Food and Drug Administration                                    | In-Person     |
| Collins     | Belinda     | NIST – U.S. Department of Commerce                                   | In-Person     |
| Conn        | Kerrienne   | Alliance for Telecommunications Industry Solutions                   | In-Person     |
| Cooperstein | Sharon      | Green Seal Inc.  | In-Person     |
| Covington   | Christine   | SEIA   | In-Person     |
| Cronin      | Amy         | National Fire Protection Association                                 | In-Person     |
| Crosta      | Paul        | Standards Publishing Associates LLC                                  | In-Person     |
| Desjardins  | Emily       | JEDEC SSTA   | In-Person     |
| DiBernardo  | Mary Jo     | NIST – U.S. Department of Commerce                                   | In-Person     |
| Dominick    | Chiriyana   | SRA International, Inc.  | In-Person     |
| Donaldson   | Mary        | NIST – U.S. Department of Commerce SCCG                              | In-Person     |
| Dubay       | Christian   | National Fire Protection Association                                 | In-Person     |
| Emard       | Jean-Paul   | Alliance for Telecommunications Industry Solutions                   | In-Person     |

| Last Name          | First Name | Organization   | Participation |
|--------------------|------------|--|---------------|
| Ennis              | Mike       | SPRI, Inc.   | In-Person     |
| Escobar            | Luis       | Air Conditioning Contractors of America                            | In-Person     |
| Fagan              | Ellen      | American Speech-Language-Hearing Association                       | In-Person     |
| Farvardin          | Siavash    | International Code Council   | In-Person     |
| Fatah              | Alim       | NIST – U.S. Department of Commerce                                 | In-Person     |
| Fefer              | Rachel     | U.S. Department of Commerce  | In-Person     |
| Felinski           | David      | B11 Standards Inc.   | In-Person     |
| Firschein          | Ben        | US Pharmacopeia  | In-Person     |
| Fiske              | William    | Intertek   | In-Person     |
| Foster             | John       | STIHL Inc.   | In-Person     |
| Furey              | Inette     | DHS  | In-Person     |
| Garcia             | Patricio   | U.S. Food and Drug Administration                                  | In-Person     |
| Garner             | Jennifer   | InterNational Committee for Information Technology Standards       | In-Person     |
| Garvin             | Patty      | NCATE  | In-Person     |
| Gides              | George     | Hayes Management Consulting  | In-Person     |
| Gilbertson         | Lynne      | National Council Prescription Drug Program                         | In-Person     |
| Gillerman          | Gordon     | NIST – U.S. Department of Commerce                                 | In-Person     |
| Gilmour            | Lillian    | U.S. Department of Homeland Security                               | In-Person     |
| Goldstein          | Benjamin   | U.S. Department of Energy  | In-Person     |
| Gonzalez           | Juan       | U.S. Department of Homeland Security                               | In-Person     |
| Granum             | Angela     | U.S. Department of Commerce – ITA                                  | In-Person     |
| Graves             | William    | U.S. Department of Homeland Security                               | In-Person     |
| Grieco             | Michael    | The SI Org. Inc.   | In-Person     |
| Griffin            | Patricia   | American National Standards Institute                              | In-Person     |
| Griggs             | Ashley     | Kavi Corporation   | In-Person     |
| Grills             | George     | U.S. Coast Guard   | In-Person     |
| Gulledge           | William    | American Chemistry Council   | In-Person     |
| Hager              | Bob        | American National Standards Institute                              | In-Person     |
| Hallenbeck         | Lane       | American National Standards Institute                              | In-Person     |
| Harper             | Jim        | The Cato Institute   | In-Person     |
| Hendricks          | Renee      | U.S. Department of Homeland Security/US-VISIT                      | In-Person     |
| Higginbottom       | Karen      | Hewlett Packard Co   | In-Person     |
| Hijkata            | Heidi      | U.S. Department of Commerce – ITA                                  | In-Person     |
| Hildreth           | Anna       | Institute for Credentialing Excellence                             | In-Person     |
| Hoang              | Ben        | Orbital Sciences Corporation                                       | In-Person     |
| Hogan              | MaryAnn    | NIST – U.S. Department of Commerce                                 | In-Person     |
| Hogan              | Michael    | NIST – U.S. Department of Commerce                                 | In-Person     |
| Housewright        | Megan      | National Fire Protection Association                               | In-Person     |
| Howard             | Eli        | Sheet Metal and Air Conditioning Contractors' National Association | In-Person     |
| Hoyler             | Susan      | QUALCOMM Incorporated  | In-Person     |
| Hurlbutt           | Lori       | JEDEC Solid State Technology Association                           | In-Person     |
| Ivanov             | George     | Telecommunications Industry Association                            | In-Person     |
| Jacobs             | Josh       | Greenguard Environmental Institute                                 | In-Person     |
| Jacobs             | Stephen    | National Association of Manufacturers                              | In-Person     |
| Jillavenkatesa     | Ajit       | NIST – U.S. Department of Commerce                                 | In-Person     |
| Johnston           | Michael    | National Electrical Contractors Association                        | In-Person     |
| Joos De Ter Beerst | Chantal    | Aerospace Industries Association                                   | In-Person     |
| Justus             | Ralph      | Building Performance Institute                                     | In-Person     |
| Kadambi            | N. Prasad  | American Nuclear Society   | In-Person     |

| Last Name   | First Name | Organization  | Participation |
|-------------|------------|---|---------------|
| Kanka       | Terry      | MITRE   | In-Person     |
| Kapturowski | David      | Spruce Environmental Technologies                       | In-Person     |
| Kegley      | Bryan      | U.S. Department of Homeland Security                    | In-Person     |
| Kenney      | Thomas     | NAHB Research Center, Inc.                              | In-Person     |
| Khan        | Siraj      | U.S. Department of Homeland Security                    | In-Person     |
| Kim         | Simon      | U.S. Department of Commerce - ITA                       | In-Person     |
| Klouser     | Deborah    | Certified Automotive Parts Association                  | In-Person     |
| Ku          | Sharon     | NIH   | In-Person     |
| Kulick      | John       | Siemens USA   | In-Person     |
| Kurihara    | Thomas     | TKstds Management                                       | In-Person     |
| Lawrence    | Joan       | Toy Industry Association, Inc.                          | In-Person     |
| Lee         | Tracey     | U.S. Food and Drug Administration                       | In-Person     |
| Littler     | Tony       | Petrofac Training Services                              | In-Person     |
| Long        | Bill       | U.S. Environmental Protection Agency                    | In-Person     |
| Maas Deane  | Michelle   | American National Standards Institute                   | In-Person     |
| Marasco     | Amy        | Microsoft   | In-Person     |
| Mavely      | Mili       | American Industrial Hygiene Association                 | In-Person     |
| May         | Melanie    | U.S. Department of Energy - OITDC                       | In-Person     |
| Mays        | Don        | Consumers Union/Consumer Reports                        | In-Person     |
| McCallion   | Aidan      | National Electrical Contractors Association             | In-Person     |
| McGeehan    | Shazia     | Consumer Electronics Association                        | In-Person     |
| McKane      | Aimee      | Lawrence Berkeley National Laboratory                   | In-Person     |
| McKiel      | Mary       | U.S. Environmental Protection Agency                    | In-Person     |
| McLeavey    | Dennis     | CFA Institute   | In-Person     |
| McNabb      | Nancy      | NIST – U.S. Department of Commerce                      | In-Person     |
| Mecham      | Brent      | Irrigation Association                                  | In-Person     |
| Meincke     | Brian      | American National Standards Institute                   | In-Person     |
| Meininger   | Anne       | NIST – U.S. Department of Commerce                      | In-Person     |
| Minter      | Tracy      | Customs and Border Protection                           | In-Person     |
| Montgomery  | Stephanie  | Telecommunications Industry Association                 | In-Person     |
| Moore       | Ashley     | U.S. Department of Homeland Security                    | In-Person     |
| Morgan      | Katharine  | ASTM International                                      | In-Person     |
| Morris      | Erin       | U.S. Department of Agriculture Livestock & Seed Program | In-Person     |
| Moskowitz   | Jay        | American National Standards Institute                   | In-Person     |
| Neiman      | Elizabeth  | American National Standards Institute                   | In-Person     |
| Newton      | Elaine     | NIST – U.S. Department of Commerce                      | In-Person     |
| Nickerson   | Ayana      | American Speech-Language-Hearing Association            | In-Person     |
| O'Connor    | Martin     | U.S. Department of Agriculture Livestock & Seed Program | In-Person     |
| Offner      | Arnold     | Phoenix Contact Inc                                     | In-Person     |
| Oksala      | Stephen    | Society of Cable Telecommunication Engineers            | In-Person     |
| Opicka      | Aivelis    | ASIS International                                      | In-Person     |
| Orloff      | Greg       | CSA America, Inc.                                       | In-Person     |
| Pauley      | James      | Schneider Electric                                      | In-Person     |
| Piskorski   | Geraldine  | ASCP Board of Registry                                  | In-Person     |
| Plemons     | Robert     | NIST – U.S. Department of Commerce                      | In-Person     |
| Pollock     | Marcus     | U.S. Department of Homeland Security FEMA               | In-Person     |
| Ponleaarun  | Le         | U.S. Food and Drug Administration                       | In-Person     |
| Powers      | Chuck      | Motorola Inc  | In-Person     |
| Purcell     | Don        | The Center for Global Standards Analysis                | In-Person     |

| Last Name   | First Name    | Organization  | Participation |
|-------------|---------------|---|---------------|
| Puskar      | Erik          | NIST – U.S. Department of Commerce  | In-Person     |
| Quinn       | Anthony       | ASTM International  | In-Person     |
| Rains       | Robert        | ASME – Innovative Technologies Institute  | In-Person     |
| Ramspeck    | Claire        | American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. | In-Person     |
| Ranville    | Michelle      | Environmental Protection Agency Office  | In-Person     |
| Rifkin      | Jonathan      | National Association of State Procurement Officers                              | In-Person     |
| Riley       | James         | NEI   | In-Person     |
| Rioux       | Nathalie      | NIST – U.S. Department of Commerce  | In-Person     |
| Rossberg    | James         | American Society of Civil Engineers   | In-Person     |
| Rothleder   | Burton        | U.S. Department of Energy   | In-Person     |
| Rozsa       | J. David      | Association of Clinical Research Professionals                                  | In-Person     |
| Rugh        | Timothy       | 3-A Sanitary Standards, Inc.  | In-Person     |
| Sastry      | Rama          | U.S. Department of Energy   | In-Person     |
| Saunders    | Mary          | NIST – U.S. Department of Commerce  | In-Person     |
| Scarpelli   | Brian         | Telecommunications Industry Association   | In-Person     |
| Schnuelle   | David         | Dolby Laboratories  | In-Person     |
| Schrotter   | Frances       | American National Standards Institute   | In-Person     |
| Schutzer    | Dan           | Financial Services Technology Consortium  | In-Person     |
| Schweiker   | Jane          |   | In-Person     |
| Scolnik     | Alvin         | National Electrical Manufacturers Association                                   | In-Person     |
| Shebell     | Peter         | U.S. Department of Homeland Security  | In-Person     |
| Smith       | Dan           | ASTM International  | In-Person     |
| Snyder      | Donald        | Underwriters Laboratories Inc.  | In-Person     |
| Stanford    | Sharon        | American Dental Association   | In-Person     |
| Stone       | John          | Michigan State University   | In-Person     |
| Strauss     | Warren Martin |   | In-Person     |
| Swift       | Roy           | American National Standards Institute   | In-Person     |
| Thomas      | Charles       | U.S. Department of Homeland Security  | In-Person     |
| Thompson    | David         | Manufacturers Standardization Society   | In-Person     |
| Thompson    | Jim           | American National Standards Institute   | In-Person     |
| Tice        | Patrima       | American Speech-Language-Hearing Association                                    | In-Person     |
| Tierney     | Michael       | Builders Hardware Manufacturers Association                                     | In-Person     |
| Tobert      | Gwen          | U.S. Department of Homeland Security  | In-Person     |
| Tongson     | Nicolas       | American Institute of Aeronautics and Astronautics                              | In-Person     |
| Updegrove   | Andrew        | Gesmer Updegrove LLP  | In-Person     |
| Urban       | Mike          | FICO  | In-Person     |
| Wall        | Nate          | 3-A Sanitary Standards, Inc.  | In-Person     |
| Warholic    | Michele       | Certified Financial Planner Board of Standards                                  | In-Person     |
| Weaver      | Bill          | Association for Challenge Course Technology                                     | In-Person     |
| Webster     | Lee           | Society for Human Resource Management   | In-Person     |
| Wennblom    | Philip        | Intel Corp  | In-Person     |
| Werner      | Jack          | Solar Rating & Certification Corporation  | In-Person     |
| Wild        | Cheryl        | Wild & Associates, Inc.   | In-Person     |
| Williams    | Matthew       | Association of Home Appliance Manufacturers                                     | In-Person     |
| Williams    | Trudie        | U.S. Department of Defense  | In-Person     |
| Willingmyre | George        | GTW Associates  | In-Person     |
| Wilson      | Jane          | NSF International   | In-Person     |
| Windelberg  | Marjorie      | University of Maryland University College                                       | In-Person     |

| Last Name      | First Name | Organization  | Participation  |
|----------------|------------|---|----------------|
| Winn           | Kay        | CSA America, Inc.   | In-Person      |
| Woodford       | Michael    | Air-Conditioning, Heating and Refrigeration Institute           | In-Person      |
| Woods          | Kathleen   | Outdoor Power Equipment Institute                               | In-Person      |
| Wright         | Don        | Lexmark International, Inc.                                     | In-Person      |
| Yerkes         | Sara       | International Code Council                                      | In-Person      |
| Zavaleta       | Moises     | NAFTA and Trade Office  | In-Person      |
| Zeng           | Jianchao   | FDA/CDRH  | In-Person      |
| Zimmerman      | Robert     | Homeland Security Institute                                     | In-Person      |
| Zuraski        | Theresa    | Association for the Advancement of Medical Instrumentation      | In-Person      |
| August         | JK         | CORE, Inc.  | Teleconference |
| Bennett        | Herbert    | NIST – U.S. Department of Commerce                              | Teleconference |
| Biber          | Michael    | Dolby Laboratories Inc  | Teleconference |
| Church         | Colin      | U.S. Consumer Product Safety Commission                         | Teleconference |
| Costello       | Mindy      | NSF International   | Teleconference |
| Emelius Swartz | Carola     | QUALCOMM Incorporated   | Teleconference |
| Englert        | Brian      | GREENGUARD  | Teleconference |
| Fishman        | Gary       | Pearlfisher International                                       | Teleconference |
| Hsu            | Fallight   | Centre Testing International LLC                                | Teleconference |
| Kahwaji        | Autumn     | Tire and Rim Association, Inc                                   | Teleconference |
| Lamberty       | Dennis     | MTD Southwest Inc.  | Teleconference |
| Narayanan      | Vivek      | PG&E  | Teleconference |
| Nelson Shea    | Roberta    | Safety Compliance Services, LLC                                 | Teleconference |
| Pa             | Khunteang  | International Association for Continuing Education and Training | Teleconference |
| Remedios       | Sally      | Delta Faucet Company  | Teleconference |
| Shimabuku      | Hope       | Research in Motion Limited                                      | Teleconference |
| Stelts         | Michael    | Panasonic   | Teleconference |