Memorandum

February 14, 2011

To: The National Institute of Standards and Technology on behalf of the National Science and Technology Council's Sub-Committee on Standards

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Re: Comments on NIST Federal Register Notice dated December 8, 2010

On December 8, 2010, the U.S. National Institute for Standards and Technology (NIST) published a federal register notice regarding "Effectiveness of Federal Agency Participation in Standardization in Select Technology Sectors for [the White House] National Science and Technology Council's Sub-Committee on Standardization (NSTC)." The comments set forth below are in response to the NIST federal register notice.

NIST and NSTC are invited to consider three significant issues concerning federal participation in private sector standardization programs: (1) Openness and Transparency; (2) Standards Education Initiatives for federal participants in private sector voluntary standards projects; (3) Formation of Academic Advisory Committee(s) on Global Standards Education Initiatives at one or more universities in the United States.

Strategic Value of Standards

Standards have enormous value for all technologies in every industry.[2] Standards function at the DNA level of technology and economic development. Standards control access to every market in commerce. In strategic terms, "If you control an industry's standards, you control that industry lock, stock, and ledger."[3]

Nature of United States Standardization System

It is important to note the United States has the largest, most diversified and complex private sector standards development system in the world today. In 2004, the U.S. Department of Commerce published a report on *Standards and Competitiveness* that indicated at least 600 private sector standards development groups exist in the United States.[4] The report estimated approximately 450 were accredited private sector standards development organizations and approximately 150 were

[1] I have been teaching in the field of technology standardization at the Catholic University of America since 1999. Attached is a copy of the 2010 curriculum for the course *Strategic Standardization*. For further information on *Strategic Standardization*, see www.strategicstandards.com (Standards Education page).
[2] *See* attached slide, *Strategic Value of Standards*
[3] *Out of the Crisis*, W. Edwards Deming, published by the Center for Advanced Engineering Study, MIT at 302 (1986)
[4] *See* http://www.ita.doc.gov/td/standards/Final%20Site/trade_barriers.pdf .

more informal private sector standards groups (consortia) organized by various industries to address standards issues in rapidly developing technologies such as communications, the internet, cyber security, biotech and nanotech. It is estimated there are no more than 250 private sector standards development organizations or groups in the rest of the world.

In short, when considering the issues above, it is important to consider the nature of the standards development organizations and groups that manage development of private sector voluntary standards for the technologies identified in the federal register notice.

Federal Participation in Development of Private Sector Voluntary Standards

The federal management plan for participation in development of private sector voluntary standards is set forth in OMB Circular A-119.[5] This plan was amended and reaffirmed by Congress in 2004 with the passage of the Standards Development Organization Advancement Act.[6] OMB Circular A-119 states that federal employees are encouraged to participate in the development of private sector standards where the following due process procedures are used to develop consensus voluntary standards:

(i) Openness.
(ii) Balance of interest.
(iii) Due process.
(vi) An appeals process.
(v) Consensus, which is defined as general agreement, but not necessarily unanimity, and includes a process for attempting to resolve objections by interested parties, as long as all comments have been fairly considered, each objector is advised of the disposition of his or her objection(s) and the reasons why, and the consensus body members are given an opportunity to change their votes after reviewing the comments.

Openness and Transparency

For many years, openness and transparency have been considered critical due process requirements for the development of private sector voluntary standards. In effect, openness and transparency are the foundation for the fairness and credibility of a private sector standards project. In 2003, the Center for Global Standards Analysis published a survey report of standardization experts that identified fairness as one of the most critical aspects of private sector standards development projects. As stated by the report:[7]

[5] *See* OMB Circular A-119 (Federal Register, February 19, 1998)
[6] *See* Public Law 108-2 enacted June 22, 2004.
[7] S*ee* www.strategicstandards.com (Standards Education page) for a copy of the complete report.

Fairness is critical to the standardization process

When considering which standards issue is the most significant, Members of the Center were surprised to see the survey indicate that "fairness" is an issue that has the same relevant significance as "technology" issues, and was considered to be more significant that "economic" issues. It was not surprising to see "technology" issues identified as the most important factor in a standardization program, and for the most part, Members of the Center expected that "economic" issues would be a strong second to "technology' issues. One interpretation of this survey result is that "if participants do not believe in the integrity of a private sector standards program or process, nothing else matters." Clearly, individuals and organizations responsible for development of voluntary standards need to pay careful attention to the "process" associated with development of a private sector standard.

The emphasis on "fairness" may reflect an understanding by participants in the survey that serves to confirm the economic significance outlined by Dr. Edwards Deming at the beginning of the Executive Summary:

> "*If you control an industry's standards, you control that industry lock, stock and ledger*."

Standards frequently have great economic significance in the marketplace, therefore, the development of standards should be given significant attention by participants. It is essential that all participants have a common understanding of "fairness" in the standards development process. Failure to address the issue of "fairness" may lead to delays, a misallocation of resources, or in the worst case, a collapse of the standards program. In short, fairness and confidence in the standards process are essential.

The need for openness and transparency in private sector voluntary standards projects has been significantly reinforced by Congress, the Supreme Court, other Federal Courts and the U.S. Federal Trade Commission.[8] In a recent decision by the U.S. Court of Appeals for the Federal Circuit, the Court decided that a patent was unenforceable because a participant in a private sector international standards project failed to disclose a patent that related to the draft technology standard being considered, in short, there was a failure by the participant to comply with the patent disclosure transparency policy of the standards development organization managing the project.[9] Question: should federal participation in private sector voluntary standards projects be limited to those projects where there is an effective written disclosure policy in effect for patents essential to comply with the technology being developed?

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[8] *See*, for example, Standards Development Organization Advancement Act (2004); *Allied Tube & Conduit Corporation v. Indian Head, Inc*. 486 U.S. 492 (1988); *American Society of Mechanical Engineers v. Hydrolevel Corporation*, 456 U.S. 556 (1982); In the Matter of *Dell Corporation*, 121 F.T.C. 616 (1996), *see* http://www.ftc.gov/opa/1996/06/dell2.shtm.

[9] *See Qualcomm v. Broadcomm*, 548 F.3d 1004 (2008); an article discussing the case is attached.

Note the need to ensure openness and transparency of federal government participation in private sector voluntary standards projects is consistent with the principles of the *Sunshine in Government Initiative* published in 2009.[10]

The significance of due process requirements for openness and transparency for private sector voluntary standards projects becomes more apparent when the diversity of the United States Private Sector Standards system is considered. For example, virtually all private sector standards organizations that are accredited by a third party have due process requirements for openness and transparency, however, standards consortia or other more informal private sector standards groups may not have such due process requirements or rely upon limited openness and transparency requirements at best.

The NIST federal register notice identifies a number of cutting-edge technologies that include the Smart Grid, Health Information Technology, Cyber Security, Emergency Communications Interoperability, Radioactivity Detectors and Radiation Monitors (ANSI N42.3x and N42.4x), and other technologies involving significant Federal agency participation in standards setting. It is very probable the private sector standards organizations that manage the development of voluntary standards for these technologies include a combination of accredited standards development organizations and standards consortia. It is also possible that several of these organizations or groups do not have written due process policies concerning openness and transparency, or provide an opportunity for all interested parties and the public to attend standards development meetings.

The diversity of the United States Private Sector Standards system raises two important questions concerning federal participation in development of private sector standards projects:

1. Should federal participation in private sector voluntary standards projects be limited to projects that have effective written policies for openness and transparency?
2. Should federal participation in private sector voluntary standards projects be limited to projects where attendance at development meetings is available to all interested parties and the public?

Virtually all United States private sector standards development organizations have an internet website. Should the federal government promote the use of internet technology among standardization organizations and groups by recommending establishment of a specific internet website for standards development activities to enhance openness and transparency for all interested parties?

Standards Education Initiatives for Federal Participants

Development of private sector voluntary standards is a complex process that requires participants to have a multidisciplinary set of skills to be effective. In 2003, the Center for Global Standards Analysis published a report on the need for multidisciplinary skills that stated:[11]

> The survey indicated a very strong consensus for development of a multi-disciplinary approach to standards education. Survey questions 7 and 8 were intended to solicit views

[10] *See* http://sunshineingovernment.org

[11] The complete report can be reviewed at www.strategicstandards.com (Standards Education page).

> and perspectives of participants on the multidisciplinary nature of standards development. There was an overwhelming number of survey participants who believe that a multidisciplinary standards course would be valuable. In survey question 7, 95% of the respondents saw the need for such a course at the university level, and in survey question 8, 81% saw the need for such a course for employees. To create a multidisciplinary course, those involved in the development of such course should carefully consider the appropriate balance of standards education issues best suited to meet the specific needs of university students or professionals that will participate in the program. The philosophy, "one size fits all," will not work. For example, technology and engineering issues may be particularly important in a given program while regulatory issues may deserve special attention in another program.

If federal participants have a solid background in engineering, science and/or technology, those skills are important in a private sector voluntary standards development project, however, they are not sufficient to address all circumstances that may occur during such project. As stated in the 2008 article, *Education is the Key to the 21st Century*:[12]

> The world of global standardization is a complex environment that typically involves engineering, science and other significant technology issues. There are however other important issues involved in global standardization, for example, economic and business considerations, global trade, health, safety, the environment, sustainability, public policy and legal considerations such as intellectual property. Being a good engineer, therefore, is not good enough to succeed as an active participant in the complex world of global standardization. Multidisciplinary skills are necessary in order to be effective.
> Even current participants with decades of experience in global standardization are struggling to maintain and further enhance their standards development skills. In short, the world of global standardization is under considerable stress to effectively deal with increasingly complex issues based upon a standardization process that requires openness, transparency, fairness, excellent administration and communications, and that gives due consideration to the needs of developing nations. Moreover, global standardization is increasingly expensive. Demands for a more effective global standardization system have become a world wide chorus.

The need for continuing education in the field of private sector standardization is critical for all participants in such projects. The Center for Global Standards has published five reports since 2003 that identify specific issues related to the strategic value of standards education for participants in voluntary standards development projects. These reports include:[13]

1. United States Standards Education Content and Priorities (2010)
2. United States Standardization Policies (2009)
3. The Strategic Value of Standards Education (2008)
4. A Survey of United States Schools of Engineering (2004)
5. A Survey of United States Standardization Experts (2003)

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[12] A copy of the SES Engineering Journal article is attached.

[13] All Center reports can be reviewed at www.strategicstandards.com (Standards Education page).

The need for a multidisciplinary set of skills in order to participate effectively in private sector voluntary standards projects raises the following questions concerning federal participants:

1. What is the status of current skills, education level and standardization experience for federal participants in private sector voluntary standards projects?
2. Do current federal participants in private sector standards development projects have multidisciplinary skills that will allow them to be effective in this complex environment?
3. What is the current demographic profile of federal participants in private sector voluntary standards projects, for example, (a) are there a sufficient number of federal participants with the necessary multidisciplinary skills to be effective participants; (b) will retirements by federal participants have a negative impact on the ability of the federal government to participate effectively in private sector voluntary standards projects for the technologies identified in the NIST federal register notice?
4. To what extent has the federal government created and maintained continuing education programs for federal participants in private sector voluntary standards projects? If such programs exist, do they need to be expanded and/or upgraded?

Formation of Academic Advisory Committee(s) for Global Standards Education Initiatives

Since 2000 several countries have initiated significant global standards education programs to educate the next generation of standardization experts. For example, China's program for standards education now involves more than 30 universities with Jiliang University serving as the Center for China's national standards education program.[14] South Korea's program involves more than 40 universities and includes several thousand engineering students who study standardization issues on an annual basis.[15] Significant standards education programs have also been initiated by the Asia Pacific Economic Cooperation, Japan, other Asian countries, Germany and Holland.

Among approximately 380 Schools of Engineering in the United States, there are currently four universities that have a course on standards: Catholic University of America, University of Colorado (Boulder), Purdue University and the University of Pittsburgh. There are also 3 law schools that offer a course on standards: Arizona State University, Seattle University and Yale University.

In order for the United States to remain competitive in the field of global technology standardization, it is recommended that an Academic Advisory Committee for Global Standards Education Initiatives be created at one or more universities in the United States to (1) effectively address the significant increase in global standards education programs in Asia and Europe intended to train the next generation of global standardization experts, and (2) provide a national academic forum to discuss strategic relationships between global technology standards, global standardization and globalization of technology markets and services.

In the White House *Strategy for American Innovation*, the policy makes several references to the use of universities as incubators for research and development critical to America's economic

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[14] *See* attached article on China's standards education program.

[15] *See* http://www.astm.org/SNEWS/MAY_2005/letters_may05.html; http://www.astm.org/SNEWS/MARCH_2005/kang_mar05.html

growth and development. Why not use universities as incubators for research and development of effective strategies that can be used to significantly enhance United States efforts to remain competitive in a global economy dominated by economic and technological globalization?[16]

The purposes of the Advisory Committee(s) would be to (1) promote the creation of global standardization courses within the United States Academic Sector, and (2) conduct study and research of global standards and standardization issues that include the following: health, safety, environment, sustainability, performance v. design concepts, interoperability, trade, competition, language, symbols, testing, certification, conformity assessment, public policy, legal, schedules for review and modification of standards, as necessary; the need for standard(s), potential effectiveness and benefits of standard(s), scope of standard(s) (national, regional or international), standardization forum(s) (national, regional or international), fairness, stakeholder balance, impartiality, transparency, openness, consensus process, reconciliation of conflicting standards, right of appeal, social responsibility, technical assistance, relationship between private sector and government standards, technological change, internet, education and awareness, information and knowledge transfer, resources and funding.

A Committee's activities should include conducting and/or participating in public forums to present and discuss research findings concerning the global standardization issues above.

To communicate globally with parties interested in global standardization, the Committee(s) should publish their research on the internet.

In 2005, a revised United States National Standards Strategy was approved.[17] Section 10 of the Strategy addresses national standards education priorities and initiatives as set forth below:

> *10 — Establish standards education as a high priority within the United States private, public and academic sectors*
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> Education programs covering the development and implementation of standards need to become a high priority within the United States. These programs must focus on the needs of leaders and top executives, those who participate in the development of standards, university and college students, and other interested parties. Tactical initiatives for all stakeholders, including *standards developers*, *ANSI*, *government*, and *academia* include:
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> 1. Develop new or significantly enhance existing standards education programs that address the significance and value of standards to the well-being of the United States and global economies.
> 2. Develop or significantly enhance standards education programs that address the needs of specific groups within the United States. These programs must reflect the multidisciplinary environment in which standards development takes place and address national and international standards development procedures; the relationship between private and public sector standards; the environment, health, safety, sustainability, international trade, public policy, competition, legal, economic benefits, and strategic considerations; and how to balance the interests of stakeholders.

[16] *See* http://www.whitehouse.gov/sites/default/files/uploads/InnovationStrategy.pdf
[17] *See* http://www.ansi.org/standards_activities/nss/usss.aspx

3. Develop a national database of standardization case histories. The database should be jointly managed by the American National Standards Institute and the U.S. Department of Commerce.

4. Encourage universities and colleges within the United States to create standardization education programs in fields of study such as engineering, science, technology, government and public policy, business, economics and law.

5. Facilitate and enhance the creation of a communications network for standardization education programs among all interested parties in the private, public and academic sectors. Utilize Internet technology to the fullest extent possible to facilitate the development of e-learning and standardization education programs.

The formation of one or more Academic Advisory Committees within the United States Academic Sector would (1) facilitate continuing education opportunities for federal participants in private sector voluntary standards projects, and (2) provide a valuable research tool for the United States to remain competitive in the field of global technology standardization.

I hope these comments are helpful. If you require further clarification or comments, please send an email to donpurcell@strategicstandards.com .