

# The National Technology Transfer and Advancement Act

*Celebrating 10 Years of Private-Public Partnership  
Success in Standards Development*

**March 2006**



**Examples of Success Collected by the  
Standards Engineering Society in  
Recognition of the 10th Anniversary of the  
National Technology Transfer & Advancement Act**





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## The National Technology Transfer and Advancement Act Celebrating 10 Years of Private-Public Partnership Success in Standards Development

When the National Technology Transfer and Advancement Act (NTTAA) of 1995 was signed into law on March 7, 1996, it required that all federal agencies use standards developed by voluntary consensus standards bodies instead of government-unique standards wherever possible. But perhaps even more importantly, the act included provisions that encouraged federal agencies to partner with the private sector in the development of standards that not only help improve the efficiency and effectiveness of government, but strengthen the U.S. position in the global marketplace.

As we celebrate the NTTAA's 10<sup>th</sup> anniversary in 2006, it is appropriate to reflect on 10 years of successful public-private sector standards development efforts that help reduce the cost and improve the effectiveness of government, promote public safety, and protect the environment - to name but a few of the major benefits of this partnership. As part of its mission to promote an awareness and understanding of the importance of standards, the Standards Engineering Society (SES) has collected examples from over 30 standards developing organizations, federal agencies, and companies to illustrate the positive impact that the NTTAA has had so far. While these examples are only a small part of the NTTAA story, they nevertheless provide a good indication of the act's larger success story.

SES would like to thank the following organizations that made this NTTAA 10<sup>th</sup> anniversary booklet possible by contributing examples, and encourages the sharing of these examples with others to show that standards are an investment that benefit not only government and industry, but the Nation.

Acoustical Society of America  
Aerospace Industries Association  
Air-Conditioning and Refrigeration Institute  
Alliance for Telecommunications Industry Solutions  
American Dental Association  
American National Standards Institute  
American Petroleum Institute  
American Society of Heating, Refrigerating and Air-Conditioning Engineers  
American Society of Safety Engineers  
American Welding Society  
ASME International  
ASTM International  
Automotive Lift Institute  
Builders Hardware Manufacturers Association

Canadian Standards Association  
Defense Energy Support Center  
Defense Modeling and Simulation Office  
Department of Transportation  
Electronic Industries Alliance  
Electrostatic Discharge Association  
General Services Administration  
International Association of Plumbing and Mechanical Officials  
International Code Council  
NACE International  
National Fire Protection Association  
National Institute of Standards and Technology  
Naval Sea Systems Command  
Nuclear Regulatory Commission  
SEMI International  
Society of Automotive Engineers  
Society of Cable Telecommunications Engineers  
Square D Company/Schneider Electric  
United States Access Board

SES would also like to thank the following organizations for contributing their resources and expertise to collect, organize, edit, design, and print this publication:

ASTM International  
Deere and Company  
Department of Defense  
National Institute of Standards and Technology

## Acoustical Society of America (ASA)

Because of reduced resources within the U.S. Navy, many of their government specifications and standards that are the culmination of years of technical experience are no longer current. Hence, a cost-effective method of keeping required standards current is needed.

Commercial standards developed by industry are governed by market forces that focus on short-term requirements, and are unacceptable for Navy use where legacy systems with life spans of 30 or more years must be maintained. Consensus standards allow government, industry and classification societies to partner to ensure they have common practices, common interfaces, and common capability at a lower cost; this partnering avoids duplication of effort and reduces time and money in the procurement process.

This participation in consensus standards allows Navy engineering resources to remain focused on ship and ship systems mission issues. This cohesion of market forces and Navy requirements results in savings in the procurement process and lowers the cost of equipment. Further, the Navy benefits by gaining awareness of evolving technology in the global market. As an example of the process, the Acoustical Society of American (ASA) converted and updated MIL-STD-167-1, Mechanical Vibration of Shipboard Equipment, as ANSI S2.26-2001, American National Standard for Vibration Testing Requirements and Acceptance Criteria for Shipboard Equipment.

## Aerospace Industries Association (AIA)

Nearly 1,200 of Aerospace Industry Association's (AIA) national aerospace standards have been adopted by the Department of Defense (DoD) for use. Adoption is an expression of acceptance of a non-government standard for repetitive use by the DoD. Adopting national aerospace standards has allowed the DoD to comply with the policies set forth in the NTTAA to reduce to a minimum the reliance by agencies on government-unique standards.

Additionally, AIA took over the ownership of 546 former Mil-Specs from DoD that were slated for cancellation under Mil-Spec Reform. This action allowed the aerospace industry to continue using these important technical documents in their products. These former Mil-Specs were transitioned over to AIA word-for-word and given the new prefix of NASM (for inch/pound) or NAM (for metric); the standard's number stayed the same (e.g., MS21025 became NASM21025). Most importantly for configuration management purposes, the part numbers remained the same (e.g., MS21025).

## Air-Conditioning and Refrigeration Institute (ARI)

Two major ARI standards, 210/240, Unitary Air-Conditioning and Air-Source Heat Pumps, and 340/360, Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment, have been recognized by Congress — in the Energy Policy Act and in the National Appliance Energy Conservation Act — and in Department of Energy (DOE) regulations. These two standards cover approximately 90 percent of the air-conditioning and heat pump equipment sold in North America. They serve as a basis for industry-government cooperation in conserving energy and provide the foundation for ARI's product performance equipment certification program that also is recognized by DOE.

Through testing, these standards and their certification programs provide consumer information on energy efficiency for residential and commercial central air-conditioning equipment. The rating information enables consumers to make informed purchases of equipment.

These voluntary consensus standards also serve as the basis for U.S. participation in the work of International Organization for Standardization Technical Committee 86, Refrigeration and Air-Conditioning. They contribute to energy efficiency, productivity, personal comfort, and consumer awareness and they foster and enhance a positive working relationship with federal and state governments.

## Alliance for Telecommunications Industry Solutions (ATIS)

The Alliance for Telecommunications Industry Solutions (ATIS) and its 23 forums and committees, working in cooperation with a number of federal government agencies and state public utility commissions (PUCs), develop standards, including specifications and guidelines, necessary for the continuous and uninterrupted flow of wireline and wireless communications services. ATIS' 2,700 standards, almost 500 of which are ANSI standards, define frameworks for service and performance requirements, interfaces and physical characteristics for technologies, systems, and business processes and ensures interoperability. Of primary focus for many of ATIS' forums/committees is the development of standards that help carry out requirements set forth by the Federal Communications Commission (FCC). Most notably are the standards dealing with local number portability, number resource optimization, and emergency services. These standards, while voluntary, are intended to be used not only by private companies, but by federal agencies and state PUCs to foster a single standard rather than individual state-by-state standards.

*ATIS' Lawfully Authorized Electronic Surveillance (LAES) for Voice over Packet Technologies in Wireline Telecommunications Networks* standard (T1.678-2004) defines the interfaces between a Telecommunications Service Provider (TSP) and a Law Enforcement Agency (LEA) to assist the LEA in conducting lawfully authorized electronic surveillance for Voice over Packet Technologies in Wireline Telecommunications Networks. This Standard was developed for pur-



poses of a “safe harbor” as specified in Section 107 of the Communications Assistance for Law Enforcement Act (CALEA).

Regarding number portability, such documents as *Number Portability Switching Systems*, *Number Portability Program Management Plan*, *Number Portability Operator Services Switching Systems*, and the *INC Number Portability Report* are all examples of ATIS consensus standards used to understand and implement number portability.

The Emergency Services Interconnection Forum (ESIF) is the primary venue for the telecommunications industry, public safety and other stakeholders to generate and refine both technical and operational interconnection issues to ensure life-saving E9-1-1 services are available for everyone in all situations. ESIF enables many different telecommunications entities to fully cooperate and interconnect with each other to determine the best practices and solutions necessary to effectively and promptly deploy E9-1-1 services nationwide. The TTY Forum’s primary goal has been to develop acceptable solutions that enable wireless carriers to connect 9-1-1 calls over a digital wireless digital network originated by individuals with speech or hearing disabilities, when using TTYs.

### American Dental Association (ADA)

The American Dental Association (ADA) is a national and international leader in the development of standards for materials, information and technology impacting the practice of dentistry and the safety and health of the public. The Food and Drug Modernization Act of 1997 (Public Law 105-115), which amends section 514 of the Food, Drug, and Cosmetic Act, allows the U.S. Food and Drug Administration (FDA) to recognize and use consensus standards in its review process for medical devices. The association currently has 28 American National Standards Institute/ADA Specifications recognized under Section 514(c) of the Food, Drug, and Cosmetic Act. Also recognized are an additional 31 international standards developed under International Organization for Standardization Technical Committee 106, Dentistry. Many of these standards have been developed with the participation of staff from the FDA’s Center for Devices and Radiological Health.

### American National Standards Institute (ANSI)

To best serve the healthcare interests of the American public, President George W. Bush has called for the establishment of a Nationwide Health Information Network and the widespread adoption of electronic healthcare records within 10 years. In October 2005, the American National Standards Institute (ANSI) was awarded a multimillion-dollar contract from the U.S. Department of Health and Human Services to coordinate standards harmonization with the establishment of the Healthcare Information Technology Standards Panel. As sponsor of the panel, ANSI has united standards developing organizations, healthcare providers, public health agencies, consumers, and government agencies to develop a set of consensus-based stan-

dards to sustain the interoperability, privacy and security of a nationwide healthcare system. ANSI is unique in its ability to bring together diverse stakeholders across industries to support coordinated standards development activities, both within and outside of traditional standards development models.

### American Petroleum Institute (API)

Many API standards are referenced in government regulations. In fact, approximately 25 percent, or 125, of API's 500 standards are referenced in the U.S. Code of Federal Regulations. The use of the standards results in reduced compliance costs and improved reliability. One specific example of a standard used in place of government regulations is the Safety and Environmental Management Program (SEMP). The U.S. Minerals Management Service (MMS) issued a notice of intent to develop SEMP requirements for offshore oil and gas operations. API, in response, produced API Recommended Practice 75, Safety and Environmental Management Programs, and demonstrated to the MMS that offshore operators, who helped develop the documents, would voluntarily comply with these practices. The savings to the industry was conservatively estimated at \$200 million for the first year and \$20 million per year thereafter.

### American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)

Since being developed in response to the energy crisis in the 1970s, the American Society of Heating, Refrigerating and Air-Conditioning Engineers' (ASHRAE) energy conservation standard 90.1, Energy Standard for Buildings Except Low-rise Residential Buildings, now influences building designs worldwide. It sets design requirements for the efficient use of energy in buildings. Developed as a voluntary consensus standard, 90.1 has become the basis for building codes, and the standard for building design and construction throughout the United States. The standard is referenced in the Federal Energy Policy Act, meaning state building codes meet or exceed the standard's requirements. The federal government also has adopted the provisions of 90.1 for all relevant federal and federally funded construction, which allows the government to competitively procure products and equipment also used in the private sector, thus saving first cost and having products that are readily available. Finally, using periodic updates to 90.1 provides consistent application of the criteria and improvements in the technology and marketplace, and achieves sustainability requirements for building rating programs.

### American Society of Safety Engineers (ASSE)

Many of the standards of the American Society of Safety Engineers (ASSE) are referenced in government standards, rules, and other documents. Almost all of ASSE's voluntary national consensus standards are referenced in the U.S. Code of Federal Regulations or in state legislation and regulation.

ASSE members and the public have provided data and anecdotal evidence that the use of these standards has resulted in reduced compliance costs, enhanced performance, and improved reliability. One specific example is the use of ANSI/ASSE Z359.1-1992(R1999), American National Standard for Fall Arrest. Government agencies at the state and national levels use the standard as a requirement for equipment and materials used to safeguard the safety and health of workers. In addition, ASSE's A10.8 standard on Scaffolding Safety Requirements is referenced by government agencies as a primary document for use with scaffolding systems on construction and demolition sites.

## American Welding Society (AWS)

A large number of American Welding Society (AWS) standards have been adopted by the National Aeronautic and Space Administration and the Department of Defense and replace existing MIL-Specs. By default, many AWS standards are referenced in government regulations. One AWS standard is a joint publication of the American Association of State Highway and Transportation Officials (AASHTO), AASHTO/AWS D1.5:2002, Bridge Welding Code. A number of standards, including AWS D1.1/D1.1M:2006, Structural Welding Code — Steel, are referenced in the U.S. Code of Federal Regulations (CFR). A key welding standard published by AWS is ANSI Z49.1:2005, Safety in Welding, Cutting, and Allied Processes, where the U.S. Departments of the Air Force, the Army, Labor (the Occupational Safety and Health Administration), the Navy and Public Health Service (National Institute for Occupational Safety and Health) are all represented.

## ASME International

More than 100 ASME International standards are referenced in government regulations. They range from standards that are used across many agencies and industry segments such as ASME Y14.5, Standard on Dimensioning and Tolerancing, to those referenced by the Nuclear Regulatory Commission for the nuclear industry. The use of these standards has resulted in better interoperability, reduced compliance costs and improved safety and reliability. ASME is also an active partner in the development of programs to meet the needs of regulators and industry. A good example of this is ASME QRO-1, Standard for the Qualification and Certification of Resource Recovery Facility Operators, and the associated certification program.

This program was conceived after a training course for resource recovery facility operators, which was jointly sponsored by ASME and the Northeast States for Coordinated Air Use Management. The waste-to-energy industry was relatively new, and considering the environmental, health, and safety issues, the competence of the operators had become a major concern. Several states had begun developing certification programs, however none had been put into effect. ASME formed a committee to develop qualification requirements for resource recovery facility operators, as regulatory bodies felt that this would be the best vehicle for accom-

plishing the following goals: creating consistent requirements throughout the country with reciprocity between states that would be fair to operators of all jurisdictions; testing in accordance with a national standard to enhance professionalism; and creating the best answer to the public's expectations that plants will be operated properly.

ASME developed a standard, altered its internal operating policies in order to allow the direct certification of individuals and produced a program that now has over 1,500 certified operators of resource recovery facilities processing municipal solid waste and which is recognized by the Environmental Protection Agency as providing the means to comply with their regulations.

## ASTM International

ASTM International has been both a major beneficiary of and contributor to the success of the NTTAA. ASTM has embraced the role envisioned for standards developing organizations under the act and counts over 1,000 U.S. government agency representatives among the membership of ASTM technical committees. Working in partnership with government, industry, consumers, and other stakeholders to meet regulatory objectives, over 3,000 ASTM standards have been incorporated by reference in the U.S. Code of Federal Regulations.

In 2005, the Federal Aviation Administration (FAA) chose to reference 15 voluntary consensus standards developed by ASTM International Committee F37 on Light Sport Aircraft in lieu of developing its own federal regulatory standards. Advocates of light-sport aircraft — such as the Experimental Aircraft Association (EAA) — welcomed the FAA's reference of the ASTM standards because the standards were carefully crafted with the active participation of light sport aircraft and parts manufacturers, flight instructors, user groups, pilots, and regulatory representatives, and because the standards meet the regulatory objectives of the agency. The EAA and others believe that FAA's acceptance of ASTM standards will save time and resources, allowing the nascent light sport aircraft industry to mature. In announcing the action, the FAA noted the goals of the NTTAA and stated, "Accepting the ASTM standards demonstrates the FAA's role as a partner with industry and the public in developing and implementing the use of consensus standards for the light-sport aircraft community."

## Automotive Lift Institute (ALI)

The longstanding Federal Specification OO-L-360, Lift, Motor Vehicle, covered in-ground automotive lifts. This specification was last revised in 1985 but was never modernized to include surface-mounted lifts as they became prevalent in the market during the late 1980s. Finally, this specification was withdrawn in 1995 in favor of existing American National Standards that covered all types of automotive lifts.

While the U.S. Occupational Safety and Health Administration (OSHA) has no standards specifically covering automotive lift safety, several state occupational safety and health pro-

grams, Canada's Ministry of Labor, and the International Building Code have all seen fit to reference the current American National Standard governing automotive lift construction, testing and validation, ANSI/ALI ALCTV-1998, Automotive Lifts — Safety Requirements for Construction, Testing and Validation.

Perhaps more importantly, federal and state OSHA enforcement personnel and Canada's Ministry of Labor vigorously recommend that automotive lift owners follow the guidance of the American National Standard governing automotive lift operation, inspection and maintenance, ANSI/ALI ALOIM-2000, Automotive Lifts — Safety Requirements for Operation, Inspection and Maintenance. The guidance offered in this standard is routinely recommended by occupational health and safety enforcement personnel for abatement of citations issued under the General Duty Clause [Section 5(a)(1) of the Occupational Safety and Health Act of 1970] when automotive lifts are observed to exhibit lack of maintenance or as the result of an accident involving the automotive lift, the operator or the raised vehicle.

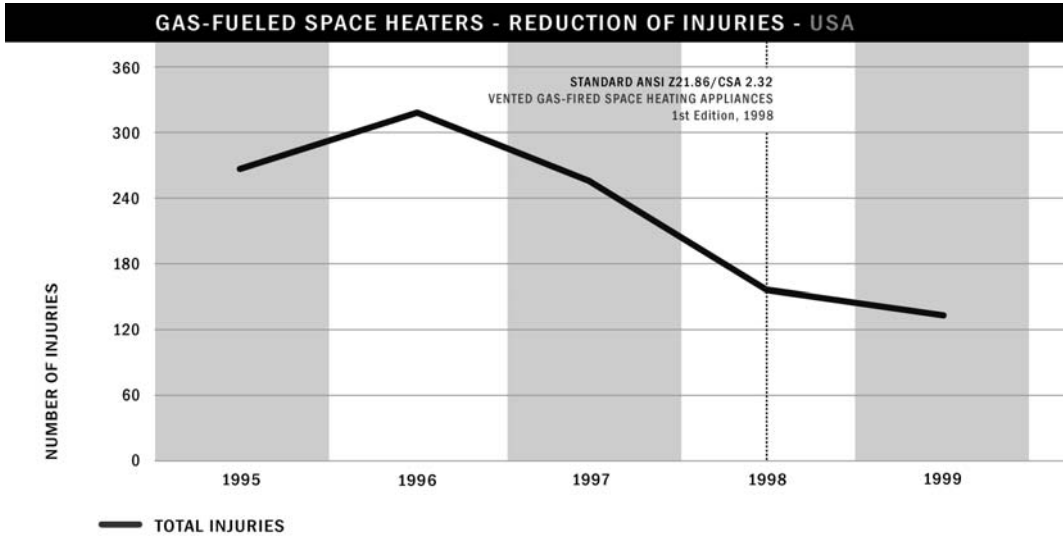
### Builders Hardware Manufacturers Association (BHMA)

The Builders Hardware Manufacturers Association (BHMA) is the only U.S. organization accredited by the American National Standards Institute (ANSI) to develop and maintain performance standards for builders' hardware. Standards are the written descriptions and criteria that precisely define the appropriate operation, performance characteristics, physical properties, test values, usage parameters, safety criteria, etc., of specific types of builders' hardware products.

BHMA assumed the sponsorship of the federal specifications for builders' hardware, which has grown into a series of 32 standards in a very active industry and public consensus process, covering everything from hinges to locks to power doors. BHMA continues to identify and develop standards, where needed, to improve product safety and utility, such as recently publishing a standard that covers manual and power operated revolving doors. As a result of their involvement with ANSI and standards development, BHMA has been identified as an authority on safety and security within its industry and has been acknowledged as the representative voice of builders' hardware.

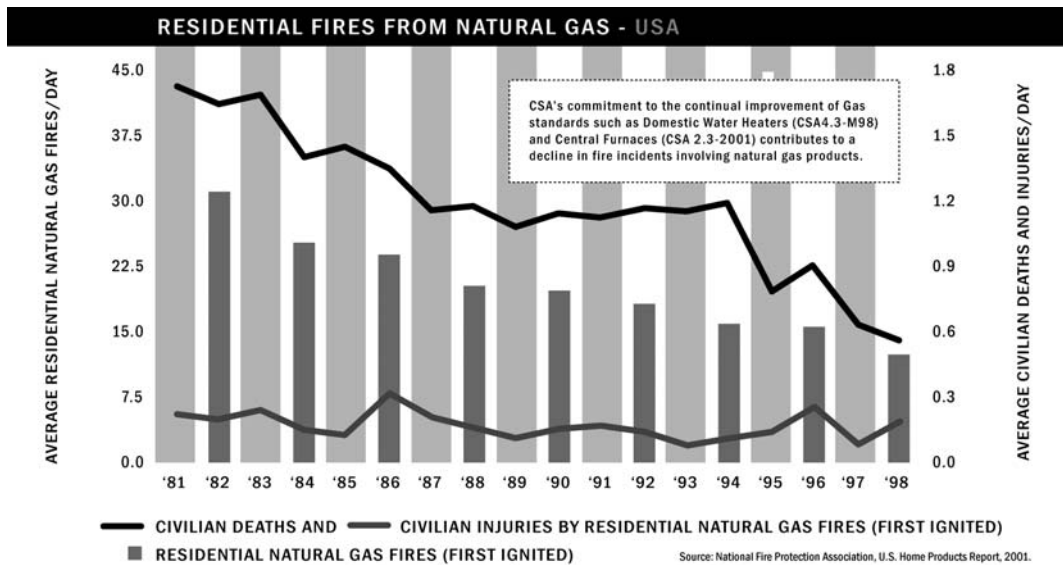
### Canadian Standards Association (CSA)

Gas, wood, kerosene and electric space heaters are a great way to make a room cozy and cut down on heating costs. But the ultimate cost of a space heater that isn't installed or operated properly is far greater. Since 1998, calling out CSA standards in local codes have helped reduce the number of injuries resulting from gas-fueled space heaters in the United States.



Source: National Fire Protection Association, Fire Analysis and Research Division, Home Heating Fire Patterns and Trends, 2003.

CSA's commitment to the continual improvement of gas standards involving domestic water heaters and central furnaces has contributed to a steady decline in fire incidents. By calling out CSA standards in local codes, in the past 10 years, the number of injuries caused by household fires involving electrical or gas products in Canada and the United States have declined by more than half.



Source: National Fire Protection Association, U.S. Home Products Report, 2001.

## Defense Energy Support Center (DESC)

ASTM International product specifications and test methods are key to U.S. government fuel procurements. The Defense Logistics Agency's Defense Energy Support Center (DESC) uses non-government standards to buy fuel for the military and for many federal civilian agencies including the U.S. Postal Service, the National Aeronautics and Space Administration and the National Park Service. Today DESC uses ASTM D 975, Standard Specification for Diesel Fuel Oils, as the only specification to define all automotive diesel fuel purchases in the Midwestern United States. Prior to 2004, some DESC customers in this geographic area requested ASTM D 975, while others required a federal specification product. By having all of their Army customers in the Midwestern United States buy to only one specification, DESC was able to accrue further savings of \$820,000 in both 2004 and 2005. In addition, recently awarded contracts support additional Army requirements for ASTM D 975 in Alaska, Arizona, California, Utah and Virginia.

## Defense Modeling and Simulation Office (DMSO)

The Defense Modeling and Simulation Office (DMSO) has partnered with non-government standards bodies both to convert government standards into commercial standards and to develop new standards. For example, after the Department of Defense developed standards for high level architecture for modeling and simulation to provide a method to manage federations of simulations in the time domain rather than allowing them to run asynchronously, a market was identified for high level architecture applications to commercial simulations. Consequently, the Simulation Interoperability Standards Organization undertook an effort to convert the high level architecture standards to commercial standards under the auspices of the Institute of Electrical and Electronic Engineers (IEEE). The result was the issuance of four standards in the IEEE 1516 series dealing with modeling and simulation high level architecture, which have been adopted for use by the DoD.

DMSO also partnered with the InterNational Committee for Information Technology Standards to respond to a need for standardization of data mediation by developing eight Synthetic Environmental Data Representation and Interchange Specification (SEDRIS) standards under the auspices of the International Organization for Standardization and the International Electrotechnical Commission's Joint Technical Committee 1, Information Technology. These standards will not only be adopted by DoD, but DMSO is also working with the North Atlantic Treaty Organization (NATO) to adopt the high level architecture and SEDRIS commercial standards as modeling and simulation standards to be used by NATO. Such efforts will help promote interoperability among U.S. military forces and allies.

## Department of Transportation (DOT)

The transportation industry has a history of using proprietary communications protocols from different equipment manufacturers. But devices and systems from one manufacturer or devel-

oper tended not to operate with those of others. Too often, state and local highway departments and transit agencies had to deploy separate systems for each manufacturer and device. The Department of Transportation's (DOT) National Transportation Communications for Intelligent Transportation System Protocol (NTCIP) enables interoperability in transportation systems and the interchangeability of devices with standard features.

NTCIP is a family of standards that provides the rules (protocols) for communicating and the vocabulary (objects) necessary to allow electronic traffic control equipment from different manufacturers to operate with each other as a system. NTCIP is the first set of transportation industry standards that allows systems to be built using a mix-and-match approach with equipment from different manufacturers. NTCIP standards reduce reliance on specific equipment vendors and one-of-a-kind software. The results are lower costs to taxpayers and users, increased system efficiency, and longer service life.

To assure manufacturer and user community support, NTCIP is a joint product of the National Electrical Manufacturers Association, the American Association of State Highway and Transportation Officials, and the Institute of Transportation Engineers. NTCIP is funded by the Federal Highway Administration.

## Electronic Industries Alliance (EIA)

The Electronic Industries Alliance (EIA) has worked closely with numerous government agencies through decades of cooperation in creating industry standards ranging from those covering fiber optic components to communications to configuration management. One recent example comes from the EIA Sector Association entitled the Electronic Components, Assemblies and Materials Association (ECA).

The Military Standard for Test Methods for Electrical Connectors, MIL-STD-1344A, dated Sept. 15, 1993, faced a long, arduous process of necessary review and revision. Through a proposal and subsequent concerted effort, the ECA standards committee CE-2.0 on Electronic Connectors worked closely with Department of Defense representatives and was able to provide a detailed mapping between the MIL and current EIA documents. Consequently, on Oct. 22, 2004, a MIL-STD-1344A Notice of Cancellation was issued and the EIA-364 series of standards for electrical connectors were referenced as suitable replacements for over 40 military test methods.

## Electrostatic Discharge (ESD) Association

The Electrostatic Discharge (ESD) Association has been developing ESD-protective standards for the electronics industry for over 25 years. In the mid 1990s, the Department of Defense requested that the ESD Association develop a process standard to replace the current military standard, MIL-STD-1686, Electrostatic Discharge Control Program for Protection of Electrical



and Electronic Parts, Assemblies and Equipment. A replacement standard, ANSI/ESD S20.20 was published and adopted by DoD in 1999.

The replacement document, Development of an Electrostatic Discharge Control Program for the Protection of Electronic Parts, Assemblies and Equipment, has become the gauge by which all programs are measured throughout North America. The work done in conjunction with the Department of Defense has not only become a North American standard but has become a worldwide standard recognized by many countries. It has become the basis for an International Electrotechnical Commission standard, making it a true worldwide standard. Additionally, third-party certification has been developed for independent assessments of programs to this standard. This has been a major benefit not only to the military but to the electronics industry in general.

### General Services Administration (GSA)

Packaging requirements are not government-unique. While the government has developed specialized containers for weapon systems, in the field of commercial packaging the government's requirements are very similar to those of commercial entities. Even so, years ago, government packaging engineers saw a need for beefed-up fiberboard boxes and attempted to achieve a level of standardization as to overall performance by drafting government-unique standards. Many of these standards were targeted to manufacturing operations. While this effort also defined test apparatus, test methods and levels of defects acceptable to the government, the fiberboard manufacturers had little input to the requirements specified.

In March 1994, GSA officially cancelled Federal Specification PPP-B-636, Boxes, Shipping, and Fiberboard, citing ASTM International standards D 1974, Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes, and D 5118/D 5118M, Practice for Fabrication of Fiberboard Shipping Boxes, as the preferred standards for the fabrication of new fiberboard boxes, liners, and sleeves. Historical data has shown that the government documents took years to complete or revise. By utilizing voluntary standards, the documents are reviewed and revised more readily and the manufacturers are included in the writing process. ASTM procedures ensure that standards developing committees are in balance, with buy-in from producers, users, and other interested parties.

### International Association of Plumbing and Mechanical Officials (IAPMO)

Many of the International Association of Plumbing and Mechanical Officials (IAPMO) standards have been jointly developed with manufacturers in as little as one month for innovative and new products that enhance water conservation measures in terms of reduced water consumption as well as water leakage monitoring products that help prevent water wastage and associated catastrophes. A few examples include standards for special elastomeric traps that help prevent

escape of sewer gases from floor drain traps and help conserve water, and automatic water leak detection and control systems that help detect unexpected water leaks, such as from a water heater or a sudden rupture on a water connector hose. These standards for water conservation and water leak detection products provide numerous benefits to local governments and society and include cost savings to the environment along with enhanced public health, safety, and welfare.

## International Code Council (ICC)

Standards developed by the International Code Council (ICC) are referenced in government regulations. The most notable is ICC/ANSI A 117.1, Accessible and Useable Buildings and Facilities, which addresses accessibility for people with disabilities. While this standard has been in existence for many years, the Americans with Disabilities Act placed increased focus on having buildings and facilities provide access to people with disabilities. Without this standard, government would have to not only develop its own standards but would have to develop and implement educational, training and other support programs to facilitate the implementation of the standard. Uniformity is enhanced and all interested and affected parties participate in the development of the standard.

The model codes developed by the ICC are also referenced in government regulations to address the construction of new buildings and the renovation and repair of existing buildings. For example, prior to its recent adoption of the ICC codes to address embassy buildings worldwide, the U.S. Department of State (DOS) developed and maintained its own unique construction regulations. This required additional manpower, increased the time that DOS buildings could benefit from contemporary research focused on improving building safety, increased costs of construction, and ensured a lack of uniformity between DOS buildings and those of other agencies. Now DOS adopts the ICC Codes and the myriad standards referenced in those codes. Of particular importance is the application and use of those codes and reference standards in over 150 countries at U.S. embassy facilities, furthering U.S. trade interests associated with use of U.S. standards and technology abroad.

## NACE International

Prompted by planned pipeline safety legislation, a group of staff and volunteers from standards-developing organizations that publish pipeline standards met in December 2000 to promote better communication, minimize duplication of effort, and encourage adoption of voluntary consensus standards. Representatives from the Office of Pipeline Safety (OPS) attended the next meeting, and the consensus was that standards developing organizations should work closely with OPS and share information about published standards, standards under development, and needed standards on pipeline integrity.

In 2002, the group, now called the Pipeline Standards Developing Organizations Coordinating Council (PSDOCC), sent a list standards from each standards developing organization recommended for incorporation by reference in regulations plus a copy of each standard to OPS; some standards from NACE and ASME International have been incorporated and some are under consideration. The PSDOCC meets approximately twice a year, sends an updated list and any new or revised standards each year, comments on proposed legislation when appropriate, and successfully encouraged OPS to update editions of standards already cited in regulations.

The PSDOCC recently worked with OPS to write a process for transferring the results of research to needed standards and signed a memorandum of agreement with OPS.

## National Fire Protection Association (NFPA)

Since its establishment in 1896, the National Fire Protection Association (NFPA) has worked closely with governments agencies at the local, national, and international levels regarding the use and adoption of NFPA codes and standards. Today, a wide range of NFPA's approximate 300 codes and standards are used in various ways by U.S. federal agencies consistent the National Technology Transfer and Advancement Act.

Federal agencies in the U.S. utilize NFPA codes and standards in multiple ways. Perhaps most prominent are the agencies that use NFPA documents as a basis to help promulgate regulations required to carry out their mission. The following provides an example of the breadth of the subject matter addressed by NFPA documents, and the some of the agencies that utilize them:

- NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance* by the Department of State and the Army Corp of Engineers.
- NFPA 301, *Code for Safety to Life from Fire on Merchant Vessels* by the Coast Guard,
- NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports* by the Federal Aviation Administration,
- NFPA 495, *Explosive Materials Code* by the Bureau of Alcohol, Tobacco and Firearms,
- NFPA 501, *Standard on Manufactured Housing* by the Department of Housing and Urban Development,
- NFPA 805, *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants* by the Nuclear Regulatory Commission,
- NFPA 820, *Standard for Fire Protection in Wastewater Treatment and Collection Facilities* by the Environmental Protection Agency, and
- NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs* by the Department of Homeland Security

While this provides an example of the wide-ranging spectrum of federal agency involvement, there are other examples where the use of NFPA documents has significant far-reaching societal impact in serving the needs of our country. Two especially noteworthy examples are NFPA 70E, *Standard for Electrical Safety in the Workplace*, used throughout the United States by the Occupational Safety and Health Administration, and NFPA 101®, *Life Safety Code®*, which is used in all fifty states for healthcare occupancies based on the Medicaid/Medicare reimbursement through the Department of Health & Human Services Centers for Medicare and Medicaid Services (CMS), as well as the Veterans Administration and other agencies that use this document throughout their facilities worldwide.

Some federal agencies use NFPA codes and standards to directly protect their assets, and this typically results in the direct use of many NFPA codes and standards. Some are affected by the widespread adoption of documents like NFPA 70®, *National Electrical Code®*, which is used throughout the United States by the Departments such as Defense, Energy, Health and Human Services, and Labor as well as the Consumer Product Safety Commission and other agencies. Examples of other cases involve NFPA documents that are more tailored to the applicable mission of the agency, such as NFPA 914, *Code for Fire Protection of Historic Structures*, that is used by the Library of Congress, the Office of the Architect of the Capital, and the Smithsonian Institute, or installation documents like NFPA 72, *National Fire Alarm Code®*, which is used by agencies such as the Naval Facilities Engineering Command and the General Services Administration.

The examples mentioned here provide a limited glimpse of NFPA's extensive involvement relating to the National Technology Transfer and Advancement Act (NTTAA). Today, the involvement of federal agencies in NFPA projects continues to be significant. Close to 500 out of approximately 7,000 seats on NFPA committees are held by federal government employees on behalf of their agencies.

In the decade since the Act has taken effect, we continue to accumulate examples of how the NTTAA has worked and worked well, providing a testament to its inherent virtues. NFPA is proud to serve the needs of the United States by working with all government agencies consistent with this important and effective piece of legislation, and looks forward to carrying this relationship forward into the future.

## National Institute of Standards and Technology (NIST) (U.S. Department of Commerce, Technology Administration)

Standards have been an integral part of the mission of the National Institute of Standards and Technology (NIST) since its establishment in 1901. NIST staff contribute to the development of voluntary consensus standards by providing laboratory research for technical content and par-

ticipating in standards developing committees. This participation supports NIST's mission to promote U.S. innovation and industrial competitiveness.

At the recommendation of NIST, the U.S. Department of Homeland Security asked ASTM International to work with NIST and other stakeholders to develop voluntary consensus standards for urban search and rescue robots. NIST engineers and others have begun to examine potential types of standards as well as tests needed to certify compliance with them.

NIST's National Voluntary Laboratory Accreditation Program (NVLAP) incorporated ISO/IEC Guide 58, Calibration and test laboratory accreditation systems — General requirements for operation and recognition, and ISO/IEC Standards 17025, General requirements for the competence of testing and calibration laboratories, into NIST Handbook 150, *NVLAP Procedures and General Requirements*. This allows NVLAP to participate in international recognition agreements and their labs to be accepted under those agreements.

NIST actively helped the InterNational Committee for Information Technology Standards develop five universal remote console standards. These standards will provide a way for manufacturers to disclose information about their products' functions and controls to the universal remote console, which could then be easily configured by users to display only the functions they need.

### Naval Sea Systems Command (NAVSEA)

Using ASTM International Standard F 1387, Specification for Performance of Piping and Tubing Mechanically Attached Fittings, instead of developing a military specification brought new technology for mechanically attached fittings to the U.S. Navy fleet sooner. The fittings were functionally superior, less costly, and available from more sources. By using this non-government standard, the Navy was able to leverage industry resources rather than conducting the research, testing, and validating using its own resources. The Navy estimates that the cost avoidance from having industry conduct the validation testing to the ASTM standard, and the savings accrued over a 10-year period from buying commercial fittings versus MilSpec fittings, will exceed \$57 million.

### Nuclear Regulatory Commission (NRC)

The Nuclear Regulatory Commission (NRC) promulgates regulations and regulatory guidance governing the design, construction and operation of nuclear power plants and related facilities. Within the framework of the NTTAA, NRC reviews its requirements to determine those that can be replaced by consensus standards. The NRC participates with many standards development organizations to assure that published codes and standards provide sufficient assurance of public health and safety. These efforts significantly increase the assurance that published codes and standards can be endorsed in lieu of using NRC-developed requirements.

One example of a standards success involves the endorsement of Sections III (Construction) and XI (Inservice Inspection) of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code and the ASME OM Code (Inservice Testing of Pumps and Valves). These codes apply specifically to nuclear power reactors. They are developed through the consensus process and endorsed by way of the regulatory process. If the NRC did not endorse these ASME codes, the agency would either have to independently develop standards or establish the acceptable standards and methods on a case-by-case basis. The use of these standards encourages uniform application of requirements, promotes regulatory efficiency and enhances public confidence in the regulatory process.

## SEMI International

SEMI International Standard S2-0200, Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment, is intended as a set of performance-based environmental, health and safety considerations for semiconductor manufacturing equipment, and applies to equipment used to manufacture, measure, assemble and test semiconductor products.

At the National Security Agency's Special Processing Laboratory (SPL), a U.S. government production fab, SEMI S2-0200 certification is required for all tools. Certification of the SPL fab tools ensures the safety of personnel and equipment.

The Special Processing Laboratory produces Applications Specific Integrated Circuits within a Class 10 clean room. Microchips are manufactured, not only for the National Security Agency's supercomputers, but also for systems throughout the Department of Defense and the intelligence community. SPL operates their own fab because of the difficulty in obtaining these highly classified chips through commercial channels.

SEMI International standards play an important role in the efficient and cost-effective management of semiconductor and microelectronics manufacturing worldwide. With over 700 published standards and safety guidelines, SEMI International standards have helped companies reduce costs, save resources, ensure the safety of personnel and equipment, improve product quality and create a common platform for producing equipment and materials.

## Society of Automotive Engineers (SAE)

For over 100 years, the Society of Automotive Engineers (SAE) has facilitated relationships among industry, regulators, and the U.S. Department of Defense. SAE has converted more than 1,500 Military Specifications into SAE standards with more standards adopted by the DoD than any other standards developing organization.

SAE standards serve as the basis for more than 50 Federal Aviation Administration (FAA) Technical Standards Orders and Advisory Circulars. The FAA recently published TSO-C175, Galley Carts, Containers and Associated Components, basing many of its requirements on SAE AS8056, Minimum Design and Performance of Airplane Galley In-Flight Carts, Containers, and Associated Components.

The FAA has frequently asked SAE to develop standards that address performance or safety issues. Recently, the agency requested that SAE develop standard procedures for the maintenance of aircraft position lights. As a result, SAE published ARP5637, Design and Maintenance Considerations for Aircraft Exterior Lighting Plastic Lenses, which was adopted by the FAA and is currently used in its oversight activities.

This partnership with SAE has enabled the FAA to achieve many of its safety objectives while engaging industry in the establishment of performance requirements. Involving industry in the requirement development process allows companies to improve overall vehicle safety while ensuring continued profitability.

## Society of Cable Telecommunications Engineers (SCTE)

In 1996, the U.S. Congress passed comprehensive legislation amending the Communications Act. One of the legislative requirements was that the Federal Communications Commission (FCC) had to adopt rules so that consumers could receive their cable services without the need for a separate “set-top” box. There were technical challenges in doing this, the most significant being program protection. The owners of movies and other high-value content were unwilling to provide their products unless there was assurance that there would be adequate content protection — one of the primary functions of set-top boxes.

These problems were addressed through a series of negotiations between cable operators and consumer electronics manufacturers. Their “plug-and-play” agreement, documented in a Memorandum of Understanding (MOU) signed in December 2002, used voluntary consensus standards from the Society of Cable Telecommunications Engineers (SCTE) that cover the cable network, the digital video transport system, and copy protection requirements. The MOU recommended that the FCC incorporate these standards in relevant regulations, which the Commission subsequently did. This use of voluntary consensus standards made it unnecessary for the separate development of government standards.

## Square D Company/Schneider Electric

Energy efficiency is an area of great interest in today’s world of rising energy costs. As a policy on energy efficiency was being developed, the federal government identified that power distribution transformers should have minimum established energy efficiency levels. This can be a complicated and controversial area due to the varying nature of these products and their methods of manufacture.

As part of the development of the Energy Policy Act, the Department of Energy (DOE) agreed to utilize National Electrical Manufacturers Association (NEMA) TP-1, Guide for Determining Energy Efficiency for Distribution Transformers, as the basis for the minimum efficiency levels. This ANSI standard was developed in the private sector and, by using this standard, the market will see energy efficient compliant products much earlier than would have been the case if the DOE had attempted to develop their own standard. In addition, the Energy Policy Act references NEMA TP-2, Standard Test Method for Measuring the Energy Consumption of Distribution Transformers, for the test procedures for determining the efficiency levels.

## U.S. Access Board

In a single rulemaking, completed in July 2004, the United States Access Board revised its Americans with Disabilities Act and Architectural Barriers Act (ABA) Accessibility Guidelines to make them more consistent with model building codes and industry standards. The Board coordinated extensively with model building code organizations throughout the process so that differences could be reconciled.

Such efforts to harmonize the Accessibility Guidelines with model codes and standards will greatly facilitate compliance. To be enforceable, the Access Board's revised guidelines must be adopted as accessibility standards by other federal agencies. Under the Architectural Barriers Act of 1968, the ABA Accessibility Guidelines are the basis for the Uniform Federal Accessibility Standards. To date, two of the four standard-setting agencies, the U.S. Postal Service and the General Services Administration, have replaced the Uniform Federal Accessibility Standards with the Access Board's revised ABA Accessibility Guidelines in which the board has deleted agency-created technical requirements for visual alarms for people who are deaf or hard-of-hearing and replaced those criteria with a reference to the National Fire Protection Association (NFPA) 72, National Fire Alarm Code.

Similarly, the Access Board deleted its technical and scoping criteria for accessible means of egress and replaced those provisions with a reference to accessible means of egress required by Chapter 10, Means of Egress, of the International Building Code now used in the majority of states enforcing state-wide building codes as well as in numerous local jurisdictions.



