The Standards Forum And Standards Actions

Office of Health, Safety and Security

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Technical Standards Program Manager's Note

Welcome to the June 2009 edition of the Technical Standards Forum and Standards Actions. The Department of Energy (DOE) Technical Standards Program (TSP) continues to provide timely and efficient standards development services to the Department and its contractors. Recently the TSP was faced with a new challenge regarding draft technical standards. Until now all draft technical standards submitted through the TSP coordination process have had unrestricted access. In April/May the TSP had a request to post an Official Use Only (OUO) draft technical standard in TSP RevCom. This created a potential problem. TSP RevCom was not designed to handle OUO special requirements, at least not at this point in time. That led TSP staff to quickly search for an alternative process that would be relatively easy to use, consistent with the coordination requirements of the TSP, and at the same time preserve the sensitivity of OUO material. It was decided that the task would be best carried out by making use of "Entrusted" e-mail and a secured server. There were unforeseen issues that arose which made the process a bit cumbersome for several users. However, these difficulties were resolved on a case-by-case basis. During the May Technical Standards Managers' Committee teleconference this new process was examined in more detail. The Committee agreed that a more refined process should be considered for future draft standards with special handling requirements; perhaps one that involves alerting only those specific reviewers whose organizations would benefit from the draft standard being reviewed. I would like to thank Technical Standards Managers and Subject-Matter Experts for their patience in applying with this fledgling process.

The Articles

Our first article is entitled, "*3rd Quarter FY09 Standards Activity Summary Report,*" by Calvin Hopper, at Oak Ridge National Laboratory. This is the fourth installment in a series of reports on domestic nuclear safety standards development activities.

Our second article is entitled, "*NFPA 72 – Much More Than Fire Alarms,*" and written by senior NFPA electrical engineer Lee F. Richardson. NFPA 72 is the highly regarded National Fire Alarm Code. Its next edition, slated for 2010, will include significant changes that reflect systems used for weather emergencies, terrorist events, biological, chemical or nuclear emergencies, and other threats.

Our third article is entitled, "*Powering the Future – The Resurgence of Nuclear Energy,*" and written by Jan Waldauer. Nuclear energy will be making a timely comeback in an era where much needed alternative energy sources are being investigated. Nuclear energy has evolved over the past 50 years. The next generation of nuclear reactors will benefit from advances in design, security and efficiency of operations.

That's it for this edition of the Standards Forum and Standards Actions. □

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DOE Technical Standards Program Activities Summary

Technical Standards Activities Summary as of April 27, 2009		
Document Status	**Description of Status**	**Number of Documents**
In Conversion	Conversion of a DOE technical standard to a national consensus standard is a beneficial process that provides exposure for that document to other public and private sector interests. When a DOE standard is converted, a voluntary-consensus, non-DOE standards developing organization assumes responsibility for it. DOE has no further responsibility for the maintenance of the standard when this occurs.	0
In Preparation	Includes draft DOE technical standards being developed but not yet out for review and comment.	26
Out for Comment	Includes draft DOE technical standards that have been posted for review and comment in the Technical Standards Program (TSP) RevCom system.	30
Published	Includes DOE technical standards that have completed the TSP review/comment and approval process. These approved standards are posted on the TSP webpage for use.	1
Five Year Review Status		
Document Status	**Description of Status**	**Proposed/In Progress**
Revision	A revision occurs when a DOE technical standard requires technical changes or editorial changes in excess of 25% of its content.	4 / 3
Reaffirmation	A reaffirmation occurs when making no changes to a DOE technical standard at its 5-year review.	1 / 19
Cancellations	Cancellation occurs when a DOE technical standard no longer serves a purpose to DOE as determined by the Office of Primary Interest (OPI) and subsequent TSP RevCom review.	6 / 0

3rd Quarter FY09 Standards Activity Summary Report

By Calvin Hopper, Oak Ridge National Laboratory, TN

This report provides insights into domestic and international nuclear safety standards development activities.

Standards that could have current or immediate potential interests to U.S. DOE regarding nuclear facility safety are provided in this portion of the report. Public comment periods for proposed or new standards are typically 30 days. Therefore, persons wishing to monitor standards activities with more expediency should go to the ***ANSI Standards Action*** weekly publication. Information in this report is extracted from information at the ANSI website and supplemented with the author's knowledge from direct standards development participation in the American Nuclear Society and the U.S. ANSI Nuclear Technical Advisory Group for ISO Technical Committee 85, *Nuclear Energy*, Subcommittee 5, *Nuclear Fuel Technology*.

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American Nuclear Society (ANS) Standards Activities

Project Initiation Notification System (PINS) for Proposed ANS Standards

Before work on a draft standard can be developed or reaffirmed, a **P**roject **I**nitiation **N**otification **S**ystem (PINS) form must be approved and submitted to ANSI. The following projects have completed a PINS form and are in the development or reaffirmation process:

- ANS 15.2-1999, *Quality Control for Plate-Type Uranium-Aluminum Fuel Elements* (revision of ANSI/ANS 15.2-1999 (R2009));
- ANS-51.10-200x, *Auxiliary Feedwater System for Pressurized Water Reactors* (revision of ANSI/ANS 51.10-1991 (R2008)).

ANSI Recent Actions for ANS Standards

The following ANS standards were recently approved by ANSI:

- Reaffirmation – ANSI/ANS-10.2-2000 (R200x) *Portability of Scientific and Engineering Software.*

Contact Information

The ANSI/ANS standards designators (e.g., ANS-8.XX) denote which ANSI/ANS Consensus Committee and Subcommittee has purview for the proposal and development of a specific standard. General information about the purchase and participation in the development of standards may be obtained by contacting Ms. Patricia Schroeder, ANS Standards Administrator. Her contact information is:

Patricia Schroeder
Standards Administrator
American Nuclear Society
555 North Kensington Avenue
LaGrange Park, Illinois
60526 USA

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Fax: 708-352-6464
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Other Domestic Nuclear Standards Activities (PINS & New Standards for Comment)

- **American Society of Mechanical Engineers** (ASME) – Mayra Santiago, Standards Administrator (ansibox@asme.org).

- **American Society of Safety Engineers** (ASSE) – Timothy Fisher, Standards Administrator (TFisher@ASSE.Org)
  - Z490.1-2009 - *Criteria for Accepted Practices in Safety, Health, and Environmental Training.*

- **ASTM International** – Jeff Richardson, Standards Administrator (jrichard@astm.org).
  - Newly Approved:
    - C1458 - *Standard Test Method for Nondestructive Assay of Plutonium, Tritium and ^{241}Am by Calorimetric Assay*;

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- *C1493 - Standard Test Method for Non-Destructive Assay of Nuclear Material in Waste by Passive and Active Neutron Counting Using a Differential Die-Away System*; and
- *C859 - Standard Terminology Relating to Nuclear Materials*.

- New Work Items:
  - *WK23599 - Standard Guide for Materials Handling Equipment for Hot Cells*; and
  - *WK23485 - Standard Guide for Nondestructive Assay Measurements*.

- **IEEE (formerly - Institute of Electrical and Electronics Engineers, Inc.) – PE (Power & Energy)/NPE (Nuclear Power Engineering) –** William (Bill) Ash (w.ash@ieee.org).

- **Institute of Nuclear Materials Management (INMM)** – Richard Rawl (rawlrr@ornl.gov).
  - PINS - N 14.7-200x, *Packages for Type A Quantities of Radioactive Material* (new standard); and
  - Comment – N 14.5-200x, *Radioactive Materials – Leakage Tests on Packages for Shipments.*

Incidental Information about International Standards

Meeting calendars for the International Organization for Standardization (ISO) Technical Committee 85, *Nuclear Energy*, ISO TC 85 subcommittees (SC), and their working groups (WG) include:

Subcommittee/ Working Group	Title	Secretariat email	Meeting date/location
TC 85/WG 1	Terminology, definitions, units and symbols	eric.balcaen@afnor.org	TBD
TC 85/WG 3	Dosimetry for radiation processing	eric.balcaen@afnor.org	TBD
TC 85/SC 2	Radiation protection	laurence.thomas@afnor.org	TBD May-Jun 2010/Republic of Korea
TC 85/SC 5	Nuclear fuel technology	graham.v.hutson@nnl.co.uk	Jun 8-10, 2009/Manchester, UK
TC 85/SC 6	Reactor technology	Thomas.myers@nist.gov	Oct 2009/Paris, FR

Subcommittee Working Groups and their developed standards may be found at the above SC2, SC5, and SC6 links in the table. To participate in the ISO meetings/activities it is necessary to be appointed as an ANSI Delegate by the U.S. NTAG Chair, Mr. George Campbell (707-882-1640, email cglen@mcn.org).

Recent ISO activities of potential interest to DOE include:

- Approved:
  - ISO 13465:2009, *Nuclear energy - Nuclear fuel technology - Determination of neptunium in nitric acid solutions by spectrophotometry.* and

- Proposed Work Items:
  - ISO/PWI 12837 – *Qualification, training, and certification of personnel for research reactors;*
  - ISO/PWI 12838 – *Radiation protection at research and test reactors;*
  - ISO/PWI 12839 – *Emergency planning for research and test reactors;*

Continued on next page

- ISO/PWI 2919 - *Radiation protection - Sealed radioactive sources - General requirements and classification;*
- ISO/PWI 7205 - *Radionuclide gauges - Gauges designed for permanent installation;* and
- ISO/PWI 21038 - *Radiation protection - Performance criteria for radiobioassy: detection limit, minimum. testing level, relative bias and precision - Rationale and specific applications.*

International Electrotechnical Commission

Meeting calendars for the International Electrotechnical Commission (IEC) Technical Committee 45, *Nuclear Instrumentation*, Subcommittee 45A, *Instrumentation and control of nuclear facilities* and their working groups (WG) include:

Subcommittee/Working Group	Title	Secretariat	Meeting Date/Location
TC 45	Nuclear instrumentation	Russian Federation	Sep 2009/Yokohama, JP
TC 45/SC 45A	Instrumentation and control of nuclear facilities	France	Sep 2009/Yokohama, JP

Technical Committee, Subcommittee, and Working Group contact information and developed standards may be found at the above TC45 and TC 45/SC45A links. Interested parties who wish to participate in the IEC meetings/activities should contact the ANSI/IEC representative, Mr. Charlie Zegers (212-642-4964).

- Technical Committee 45A Final Draft International Standard (FDIS), IEC 61226 Ed.3: *Nuclear power plants - Instrumentation and control important to safety - Classification of instrumentation and control functions* - ballot period 04/24/2009 - 06/26/2009
- IEC /TR 62096 Ed. 2.0 b: 2009, *Nuclear power plant and control important to safety – Guidance for the decision on modernization.*
- U.S. PINS - *Nuclear Power Plants – Instrumentation and control systems important to the safety – Requirements for Computer Security Programmers.* □

NFPA 72

NFPA Journal®, *May/June 2009*

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By Lee F. Richardson

One of the most anticipated code discussions at this year's conference is the one focused on NFPA 72, National Fire Alarm Code, which was undergone an array of significant changes.

The next edition of NFPA 72®, National Fire Alarm Code®, will represent the most significant changes to the code since the NFPA detection and signaling documents were combined in 1993. Systems used for weather emergencies, terrorist events, biological, chemical or nuclear emergencies, and other threats will be directly incorporated into the new NFPA 72. Even the name of the code will change, to National Fire Alarm and Signaling Code. The evolution of the 2010 edition began with the Standards Council's decision in November 2003 to establish a new project on mass notification systems (MNS) at the request of the U.S. Air Force. A new annex, which provides guidance for the design of MNS, was added to the 2007 edition, along with a number of changes in the requirements to allow fire alarm systems and MNS to work together.

With the establishment of a new technical committee in March 2007, work began on the development of a new chapter on emergency communications systems that will be part of the 2010 code. This new chapter will address requirements for in-building MNS, wide-area MNS, distributed recipient MNS, in-building fire emergency voice/alarm communication

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systems, and in-building two-way communications systems. Existing chapters, such as the one titled "Fundamentals," will be modified as needed so that requirements are applicable to emergency communications systems, as well as to fire alarm systems. In addition, two new chapters will be added to address requirements common to both fire alarm and emergency communications systems.

While the scope of the code has clearly expanded beyond provisions for just fire alarm systems, it keeps its core focus on the need to clearly address requirements for those systems. The code will still contain its familiar chapters, but they will be organized differently.

An Eye on the Research

The 2010 edition will contain significant technical changes based on recent projects of the Fire Protection Research Foundation, work that will have an impact on how the code handles emergency notification to occupants.

Research on fire alarm notification for high-risk groups has provided the basis for changes that will require some notification appliances to use a low-frequency (520 Hz) square wave to more effectively awaken and alert people who have mild to severe hearing loss. The chapter titled "Notification Appliances" will contain a new provision, effective January 1, 2014, that will require audible notification appliances used to provide signals for sleeping areas to produce the new low-frequency signal. The chapter titled "Single- and Multiple-Station Alarms and Household Fire Alarm Systems" will contain a new provision that requires the new low-frequency signal for notification appliances installed in sleeping and guest rooms for those with mild to severe hearing loss. The chapter will also require the use of tactile notification appliances in addition to high-intensity strobes in sleeping and guest rooms for those with profound hearing loss. These provisions will be effective with the adoption of the new edition of the code.

Additionally, research on the intelligibility of fire alarm and emergency communications systems provides the basis for an extensive new annex on speech intelligibility. In many situations, fire alarm and emergency communications systems are required to provide voice instructions and information to occupants during emergencies. The ability of the system to reproduce prerecorded or live voice messages with intelligibility is critical. The new annex will provide detailed guidance for the design, installation, and especially the testing of voice systems to ensure that they are intelligible. Foundation-supported research into smoke detector spacing for complex beamed and sloped ceilings has also led to changes in the new NFPA 72. The specification of location and spacing requirements for smoke detection in joist and beam ceiling applications has been an historical challenge often resulting in installations that were overly conservative in some applications. The changes in the 2010 code will build on the changes for level beamed ceilings that were introduced in the 2007 edition. The new changes will refine and more clearly address spacing and placement requirements for level beamed ceilings and will add new spacing and placement requirements for sloping ceilings. The new and revised provisions will continue to express beam depths and beam spacing in terms of 10 percent and 40 percent of the ceiling height, respectively, rather than the fixed depth and height specified in previous (2002 and earlier) editions of the code.

Chapters and Changes

In addition to the changes that resulted from recent research, the new version of the code contains a number of other significant changes, which are presented here as they appear in the new chapter order.

The "Fundamentals" chapter will include a reorganization of the provisions formerly contained under Subsection 4.4.3, System Functions, and the overall numbering of the chapter will be streamlined by removing redundant section and subsection headings. Significant technical changes will include the following: revision of power supply requirements to include uninterruptable power supplies as a choice of supply source instead of having two independent (primary and secondary) supplies; revisions to more clearly address the priority of fire alarm, MNS, and other signals; and complete revision of the record of completion form.

The new "Circuits and Pathways" chapter will be a combination of old and new requirements. The basic wiring

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requirements from the current "Fundamentals" chapter will be relocated to the new chapter. A new section on pathway (circuit) class designations will be added. New performance designations for Class A, Class B, Class C, Class D, Class E, and Class X pathways will be provided. (Circuit-style designations are no longer used.) New pathway survivability levels will be established: Level 0, Level 1, Level 2, and Level 3. The new chapter will not require the use of a certain class and level, but will identify the performance designations and survivability levels that can be specified by other chapters or by designers.

The "Inspection, Testing and Maintenance" chapter will retain its current organization and will include the new provisions for the following: automated testing; performance-based inspection and testing; inspection, testing, and maintenance of MNS; and testing of in-building radio communication enhancement systems. The inspection and testing form will be completely revised to provide a more detailed record of testing and to address MNS.

The "Initiating Devices" chapter will include reorganization of the requirements for heat-sensing fire detectors, and the provisions formerly contained in Subsection 5.16, Smoke Detectors for the Control of the Spread of Smoke, will be relocated to the section on smoke-sensing fire detectors. In addition to the changes for smoke detector spacing described under recent research, the chapter will contain the following changes: revision of requirements related to protection of smoke detectors during building construction; elimination of 4-inch (100-millimeter) corner restrictions for smoke detectors; new provisions to allow the installation of smoke detectors close to an object or space they are intended to protect; new provisions addressing the installation and testing of gas detection equipment; and new provisions requiring manual fire alarm boxes to be red.

The "Notification Appliances" chapter, in addition to the new requirements for the low-frequency square wave described under recent research, will include revised provisions for voice intelligibility using a new term: "acoustically distinguishable space." The code will require the system designer to identify these spaces and to determine if they require voice intelligibility.

The new "Emergency Control Functions" chapter will contain the provisions formerly found in Subsection 6.16, Protected Premises Fire Safety Functions. New subsections on first responder use of elevators and elevators for occupant-controlled evacuation have been added to correlate with the 2009 edition of NFPA 101®, Life Safety Code®, Annex B, and NFPA 5000®, Building Construction and Safety Code®, Annex E.

The "Protected Premises Fire Alarm Systems" chapter will retain most of its current organization. The requirements for circuit designations (circuit class and style) will be streamlined with reference to the "Circuits and Pathways" chapter, which provides a menu of designations. New provisions will be included for non-fire alarm equipment in combination systems. The requirements for emergency voice/alarm communications systems and two-way communications service, including two-way telephone, have been relocated to the "Emergency Communications Systems" chapter. Requirements for fire safety control functions are now contained in the "Emergency Control Functions" chapter.

The "Emergency Communications Systems" chapter will, in addition to providing installation and performance requirements for different types of emergency communications systems, contain new provisions for textual visible notification appliances (message displays) for in-building MNS; public address systems that interface with fire alarm systems; high-powered speaker arrays in wide-area MNS; in-building radio communication enhancement systems; two-way communications systems for areas of refuge (area or rescue assistance); and risk analysis requirements for the design of MNS.

The "Supervising Station Alarm System" chapter will be reorganized to delete four subsections addressing legacy technologies no longer being installed: active multiplex transmission systems; McCulloh systems; directly connected noncoded systems; and private microwave radio systems. The current Subsection 8.6.4, Other Transmission Technologies, will be the first communications method addressed, followed by digital alarm communications systems and radio systems. Significant technical changes will include new provisions for the qualification of supervising station operators, the details of which are located in the "Fundamentals" chapter, and indication of remote station service, which will require owners of systems monitored by a remote supervising station to provide annual documentation identifying

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the party responsible for inspecting, testing, and maintaining the system. Revisions will also be included for requirements in current Subsection 8.6.4.

The "Public Emergency Alarm Reporting Systems" chapter—previously named "Public Fire Alarm Reporting Systems"—will be revised to more clearly address emergencies in general, not just fire, including an allowance for connection to emergency communications systems. The chapter will be reorganized in terms of "wired networks" and "wireless networks," and will provide a more logical flow of requirements.

The "Single- and Multiple-Station Alarms and Household Fire Alarm Systems" chapter will retain its current organization and will, in addition to the new requirements for the low-frequency square wave and tactile notification appliances described under recent research, include new provisions for wireless interconnected smoke alarms to ensure their wireless performance; new allowances for managed facility voice networks to be used with digital alarm communications systems for household fire alarm systems; elimination of 4-inch (100-millimeter) corner restrictions for smoke alarms; new restrictions on the placement of smoke alarms in proximity to cooking appliances; and new provisions for smoke alarms to comply with provisions in the "Initiating Devices" chapter for smoke detection in joist and beam ceiling applications.

The breadth and depth of the changes will provide NFPA 72 with a new, broader scope, and will also help the code prepare for future changes. In their developmental stages, the new chapters were added at the end of the code, which served as a temporary residence. After giving thoughtful consideration to the overall code organization—and recognizing that reassignment of chapter numbers every time a new chapter is added can be vexing to users—a new structure was devised. The new organization will contain 29 chapters, including several reserved chapters, allowing for future chapters to be added in a logical order without disrupting the numbering of existing chapters.

Lee F. Richardson *is senior electrical engineer at NFPA and staff liaison for NFPA 72*.

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Editors Note: *Contact Jim Bisker, Fire Protection Engineer, of the Office of Nuclear Safety Policy and Assistance, for questions regarding the application of national codes and standards within DOE.* □

Powering the Future
The Resurgence of Nuclear Energy

By Jan Waldauer

As the industry's renaissance continues, ASTM International remains key to standards maintenance and development.

Nuclear energy has evolved over the past 50 years, with each generation of reactors bringing improvements to design, security and efficiency of operations. The main use of nuclear energy today is to generate electricity; it is an efficient way of boiling water to produce steam to drive turbine generators. This steam is clean, safe and usually very cost-competitive.

Nearly 440 nuclear power reactors in 30 countries, plus Taiwan, provide approximately 16 percent of the world's electricity today, a share that has remained fairly constant since the mid-1980s. Due in part to increasing energy demands and concerns over climate change related to fossil fuels, significant growth in reactor construction is expected over the next 15 to 20 years, especially in Eastern Europe and Asia. The International Atomic Energy Agency predicts that at least 70 new plants will be constructed by 2030 in such countries as China, India, Russia, Finland and France. In addition, the U.S. Department of Energy expects domestic nuclear energy demands to increase by 45 percent over the next 20 years. As reactor construction increases and technology changes, the maintenance of existing and the development of new industry standards will be required.

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Industry Evolution

In the 1950s and 1960s, nuclear technology was seen as a source of inexpensive electrical power to lessen urban smog from coal-fired power plants. But due to the industry's infancy, Generation I designs were conservative, and success was somewhat hindered by high costs, multiple designs and low efficiency. Outside the United Kingdom, none of these reactors is running today.

Generation II reactors were developed in the 1970s and 1980s, and many are still in use today, particularly in the United States. While their technology is basically the same as Generation I, many improvements in design and performance can be attributed to increased operator experience, higher performing materials, design standardization and overall industry maturity.

The focus for nuclear plant design has always been safety, as evidenced in the Generation II designs and beyond. "From a safety and reliability standpoint, the incidents at Chernobyl and Three Mile Island were blessings in disguise because they prompted major changes and improvements to components and control systems. ASTM's role in the industry also became more prominent at that time, as the U.S. Nuclear Regulatory Commission (at that time, known as the Atomic Energy Commission) officially adopted several ASTM standards, such as ASTM E185 on reactor vessel surveillance program requirements and ASTM E693 on determination of displacements per atom," notes Stephen Byrne, fellow engineer at Westinghouse in Windsor, Conn., and chair of Subcommittee E10.02 on Behavior and Use of Nuclear Structural Materials, part of ASTM Committee E10 on Nuclear Technology and Applications.[1]

An important distinction between early and later Generation II designs was the desire to increase efficiency and extend operating lifetimes. The first reactors were licensed for 40 years of operation, although most have applied for license extensions for 60 years. E10 began working with the NRC in the 1960s regarding structural materials, and the extension of operating time is driving much of its current work.

Byrne comments, "There are many time and temperature sensitivities involved when increasing the lifecycle of a nuclear reactor, so a lot of our committee work in the 1980s was focused on materials aging evaluations. Our research focused on things like radiation metrology (neutron measurement) and neutron embrittlement (reduction of toughness) in order to provide updated or new standards on structural materials."

Randy Nanstad, group leader for nuclear materials science and technology at Oak Ridge National Laboratory, Oak Ridge, Tenn., and an E10 member, adds, "We continue to update standards for exposure of materials to high irradiation and high temperatures as new information becomes available and because of license extensions and designs of new reactors. The predictive models we use are based on 40-year lifetimes, so E10 is now looking at how to extend those models to develop standards for 60- or even 80-year lifecycles."

Current and Future Designs

Generation III and III+ reactor designs, created in the 1980s through the present, are more advanced than their predecessors in several ways. They have a more standard design, helping to reduce cost and construction time. They have higher burn-up to reduce fuel use and waste, and burnable absorbers to extend fuel life. Some are designed for load-following, which means that output can be changed quickly to react to fluctuating electricity demands during the day. Perhaps the largest difference between Generation II and III/III+ designs is that the newer reactors have inherent safety features that require no active controls or operator action to trigger. These newer reactors are in use today mainly in Japan and Korea, but other countries are currently building or have ordered them.

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[1]The complete ASTM standards titles are E185, *Practice for Design of Surveillance Programs for Light-Water Moderated Nuclear Power Reactor Vessels*, and E693, *Practice for Characterizing Neutron Exposures in Iron and Low Alloy Steels in Terms of Displacements Per Atom (DPA)*, E 706(ID).

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Byrne summarizes, "Generation III/III+ designs are leaner and meaner. They take the best of previous generations, along with increased operational experience and improved analytical tools, and offer a safe, reliable and green source of energy."

While reactor designs have changed over the years, components involved in the nuclear fuel cycle have remained relatively unchanged. ASTM Committee C26 on Nuclear Fuel Cycle focuses on all aspects related to this cycle, including spent nuclear fuel, waste materials and repository waste packaging and storage.

"The scope of C26's work has been fairly constant since 1969, but the number of subcommittees has expanded to reflect the changing needs of the industry," says Dick Blauvelt, senior consultant, Navarro Research and Engineering Inc., Oak Ridge, Tenn., past C26 chair and current chair of Subcommittee C26.07 on Waste Materials. "Initially C26's focus was the commercial sector, but in the early-to mid-1980s it began to also support national defense work, mainly related to waste repositories. During the Carter administration, reprocessing of spent fuel in the U.S. ceased out of concern for the proliferation of nuclear weapons materials. That certainly impacted Subcommittee C26.09 on Nuclear Processing, and since then the group has been less active on the topic of reprocessing."

Generation IV reactor designs are in the conceptual stages now, not expected to reach commercialization until 2020 at the earliest. An international task force called GIF (Generation IV International Forum) is currently developing six technologies, each representing further advances in safety, reliability, sustainability, economics and proliferation-resistance. All technologies will operate at higher temperatures than today and many will be designated for hydrogen production, which would eliminate the need for fossil fuels.

Although Generation IV designs are still on the drawing board, ASTM committees are already looking at what is on the horizon.

"Material behavior in this new generation of technology will be very different from today," says Roger Stoller, Ph.D., program manager for fusion reactor materials at Oak Ridge National Laboratory, Oak Ridge, Tenn., past E10 chair, current chair of Subcommittee E10.08 on Procedures for Neutron Radiation Damage Simulation and vice chair of the ASTM board of directors. "Generation IV reactors will require composite materials that can survive at very high temperatures as well as bring changes in fuel forms and coolants. All of these advances will require the development of new standards for structural materials, and we are already looking into what that design and testing criteria could be."

Generation IV designs will have a direct impact on C26's work, as designs are focused on closing the fuel cycle to optimize the use of federal geologic repositories for high-level wastes. Though all nuclear wastes have the potential for reprocessing (to recover reusable radionuclides), all will have residual high-level wastes that need to be placed in an appropriate repository. Different reprocessing steps provide different options for handling waste streams, and these are evaluated with regard to regulations and potential cost savings. C26 is looking at these options closely to develop standards as more tailored waste forms for Generation IV designs come on board.

International Expansion

The globalization of the nuclear industry is obvious. Many of the issues connected with nuclear power, evidenced by GIF participation, are global. Therefore, it is important that industry standards are developed with an international mindset.

Over the past 15 years, Committee E10's member participation has become more international. "ASTM standards have always been international because they are commonly used around the globe. As a result, we have purposefully solicited international input for our standards updates and development. ASTM has a large and diverse membership base, with a substantial contribution from members in other countries," says Stoller.

Nuclear waste disposal can be impacted by climate, environments and geologies, so the long-term performance of various waste forms and engineering materials will differ in different environments. C26's standards work must take

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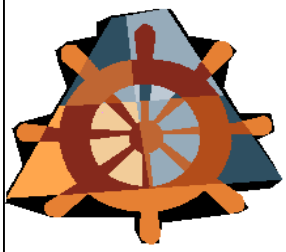
these factors into account and having international representation in and perspective on the committee is very beneficial.

Nanstad summarizes his thoughts on ASTM and its international reputation. "ASTM standards are very well-respected in many countries because they are built by consensus. For those nations just getting into the nuclear industry, they can gain some instant credibility by following ASTM standards."

Jan Waldauer *is a communications professional working in the Philadelphia area.* □



Welcome Aboard the TSMC!

By M. Norman Schwartz, Office of Nuclear Safety Policy and Assistance (HS-21)

The Technical Standards Managers (TSMs) are the backbone of the DOE Technical Standards Program! These knowledgeable individuals serve as their organization's standards point of contact and contribute to the coordination of Department-wide TSP activities. A great deal of their work time is spent in assuring that standards activities take place in a manner that will promote safe, economical, and efficient operations locally and across the DOE complex. TSMs share their ideas for TSP improvements and discuss lessons learned through monthly Technical Standards Managers Committee (TSMC) conference calls. With nearly 90 active and mobile people involved in TSM activities, it can be a daunting task just to keep up with the retirements and reassignments affecting the TSM roster. This Welcome Aboard feature is designed to introduce you to the new TSMs and help you keep abreast of the rapidly changing make-up of the TSMC. A complete list of TSMs can be found at: http://www.hss.energy.gov/nuclearsafety/ns/techstds/contact/stdmgrs.html.

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STANDARDS ACTIONS

1.0 DOE STANDARDS ACTIONS

The Department of Energy (DOE) TSP publishes Standards Actions information on a monthly basis to provide DOE headquarters and field elements with current information on DOE and select non-government standards activities.

The complete list of all DOE Technical Standards projects and their status is available on the TSP web page at: http://www.hss.energy.gov/nuclearsafety/ns/techstds/. To access these standards, go to our web page, click on "DOE Technical Standards," then choose Projects, Approved Standards, Recently Approved Standards, or Drafts for Review, as appropriate, on the left frame of the page.

1.1 New Projects and DOE Technical Standards in Revision

The following entries were received in April/June 2009:

- TRNG-0072, DOE-STD-1176-2004, *Chemical Processing Qualification Standard*, 4/27/2009, Point of Contact: Patricia C. Suggs, 803-208-6804; and
- SAFT-0129, DOE-STD-3015-2004, *Nuclear Explosive Safety Study Process*, 6/11/2009, Point of Contact: Fredrick G. Trussell, 202-586-0372.

1.2 DOE Technical Standards Posted in RevCom for TSP

Your TSM will initiate requests for specific reviewers to comment on these drafts. The list of TSMs can be found at: http://www.hss.energy.gov/nuclearsafety/ns/techstds/contact/stdmgrs.html. The full text of these documents are available for comment at RevCom for TSP (http://standards.doe.gov/login.jsp) accessed from the TSP website.

The following entry was received:

- TRNG-0072, DOE-STD-1176-2004, *Chemical Processing Qualification Standard*, 4/27/2009, Point of Contact: Patricia C. Suggs, 803-208-6804.

1.3 DOE Technical Standards in Reaffirmation

No entries were received.

1.4 DOE Technical Standards Change Notices

No entries were received.

1.5 DOE Technical Standards Published

The following entry was received:

- SAFT-0114, DOE-STD-1104-2009, *Review and Approval of Nuclear Facility Safety Basis and Safety-in-Design Documents*, 5/11/2009, Point of Contact: Jim O'Brien, 301-903-1408.

2.0 NON-GOVERNMENT STANDARDS ACTIONS

2.1 American National Standards Institute (ANSI)

ANSI publishes coordination activities of non-Government standards weekly in ANSI Standards Action. Recent electronic copies are available on the ANSI Web Site at: http://www.ansi.org/news_publications/periodicals/standards_action/standards_action.aspx?menuid=7. Refer to ANSI Standards Action for the complete list of changes and new publications, standards developing organizations, and information about submitting comments. Electronic delivery of selected documents is available through ANSI at: http://webstore.ansi.org/default.aspx.

ANSI also lists standards actions on new and revised American National Standards and International Standards Organization (ISO) Standards.

2.2 American Society of Mechanical Engineers (ASME)

ASME lists recently published standards on the ASME web site at: http://catalog.asme.org/home.cfm?Category=CS.

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Refer to the ASME web site for the complete list of changes and new publications, standards developing organizations, and information about submitting comments.

ASME maintains monthly updates of new draft standards as well as revised drafts of current standards, to meet new requirements at: http://cstools.asme.org/csconnect/PublicReviewpage.cfm.

A respective "Comment Period End Date" follows each listed document.

2.3 ASTM International

The listing of approved ASTM Standards Actions through May 2009 is made available through the "RSS News Feed" feature. You can access this feature by clicking on the "RSS" button on the ASTM web site: http://www.astm.org/.

2.4 American Nuclear Society (ANS)

The ANS "What's New" web page at: http://www.ans.org/standards/new/ lists recently initiated projects, as well as ANS standards approved in recent years.

2.5 National Fire Protection Association (NFPA)

The May 2009 NFPA News list NFPA standards available for comment, newly proposed standards, newly issued standards, and the call for members on committees. View these editions at:

- http://www.nfpa.org/assets/files/PDF/NFPA%20News/NFPANews0509.pdf. □

STANDARDS ACTIONS

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Standards Actions and *The Standards Forum and Standards Actions* are electronic newsletters available on the web at: http://www.hss.energy.gov/nuclearsafety/ns/techstds.

To update your mailing list and/or e-mail addresses, please e-mail: **TechStdPgm@hq.doe.gov** or call Norm Schwartz at Phone: 301-903-2996.

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