

Standards Actions

Technical Standards Program Newsletter

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U.S. DEPARTMENT OF

ENERGY

OFFICE OF
NUCLEAR SAFETY



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FEATURED DOE TECHNICAL STANDARDS ACTIVITIES

New DOE Standard, Communicating Waste Characterization and DOT Hazard Classification Requirements

The Department of Energy (DOE) Office of Environmental Management (EM) has a challenging mission to solve many problems posed by the legacy of the Cold War, including the transportation of unprecedented amounts of contaminated waste, water, and soil, and a vast number of contaminated structures. As one of the largest shippers of Class 7 (radioactive) material, DOE has to make thousands of shipments per year in a safe manner that complies with federal and state regulations.

In an attempt to provide a basis for developing facility specific procedures for identifying and processing material meeting U. S. Department of Transportation (DOT) definitions of Low-Specific Activity and/or Surface Contaminated Objects, a wide variety of subject matter experts outlined an approach which has been formatted into the draft DOE Standard, *Communicating Waste Characterization and DOT Hazard Classification*

Requirements. This standard was developed by the collaboration of knowledgeable field/site personnel involved in waste generation, characterization, packaging, and transportation. This team of experts reviewed existing processes, procedures, and requirements used to prepare radioactive materials for storage and shipment.

The team developing the standard reviewed data collected by the EM Office of Packaging and Transportation (OPT) on transportation incidents involving any off-site shipment of Class 7. These data, in addition to the data from the DOE Occurrence Reporting and Processing System, are used to assist DOE sites in monitoring DOE shipments for safety and compliance, sharing lessons learned, and identifying potential programmatic failures or trends. In 2009, an evaluation of transportation occurrences identified the presence of one or more of the significant causal factors (precursors) identified by DOT and the National Transportation Safety Board as contributing to incidents.

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Independent data from DOT and the U. S. Nuclear Regulatory Commission (NRC) also indicate compliance problems industry-wide with packaging and hazard communication. Inadequate material characterization is also an underlying theme for many shipments that subsequently are improperly packaged and/or have improper hazard communication.

OPT envisioned the standard as a tool which could be used at each facility for creating detailed procedures and would complement the existing management systems (e.g., operational safety assessments, on-site reviews/assessments, self-assessments, performance evaluations). The standard underscores the difference in classification terminology and requirements, specifically those used by NRC and DOT. The standard also stresses the need for early coordination between the different disciplines and for completion of DOT training for those involved in making waste determinations and packaging selection decisions.

According to the DOT, approximately 1.2 million hazardous material shipments are transported daily. The vast majority of these shipments are made safely and in compliance with regulatory requirements. The DOE transportation program has an exceptional safety and compliance record. Since 2004, DOE has safely completed over 100,000 hazardous material shipments using multiple modes of transport, both domestically and internationally.

DOE is committed to implementing a “best-in-class” transportation program for the industry by continuing to seek opportunities to improve on its safety and compliance record. The draft DOE Standard is one tool for improving operations.

Contact: Julia Donkin, EM, Office of Packaging and Transportation (EM-33)

Phone: 301-903-1431

Upcoming Workshops, Meetings, and Events

The Annual Energy Facility Contractors Group Safety Analysis Workshop

The 2012 Energy Facility Contractors Group (EFCOG) Safety Analysis Workshop will be held May 5-10, at the Buffalo Thunder Hotel in Santa Fe, New Mexico. This annual workshop offers a tremendous opportunity to enhance your technical capabilities to better support the safe operations of Department of Energy (DOE) facilities. Come learn the latest techniques, listen to lessons learned from others, be challenged by new ideas, ask questions of experts, volunteer to resolve issues, share your stories, and make important new contacts for networking. In addition, learn more about the upcoming changes to the Nuclear Safety Rule and supporting DOE Standards, Guides, and Orders.

The workshop will provide opportunities to:

- get trained in several safety analysis courses offered over the weekend;
- join a technical subgroup meeting to help resolve issues;
- obtain the latest information on how DOE and National Nuclear Security Administration (NNSA) is positioning the Complex for the future;
- tour NNSA's newest Radiological Facility, and see the history of Los Alamos;
- hear fellow Safety Analysis Working Group members present their technical work;
- participate in expert federal and contractor panels regarding important topics; and
- network with old and new friends throughout the course of the week.

Registration is available online and room reservations are being taken now. For more information, please visit the workshop's official website at: <https://sbts.lanl.gov/sawg2012>. For registration questions, please contact Denise Bjarke at 505-667-3565 or dbjarke@lanl.gov.

For questions about the workshop, please contact James Kuropatwinski, 2012 EFCOG Safety Analysis Workshop Chair at 505-412-8027 or wujek@lanl.gov.

International Organization for Standardization (ISO) Technical Committee (TC) 85, Nuclear Energy Meetings

- TC 85/Working Group 1
Terminology, Definitions, Units and Symbols
- TC 85/Working Group 3
Dosimetry for Radiation Processing
- TC 85/Subcommittee 2
*Working Groups
Radiation Protection*
- TC 85/Subcommittee 5
*Working Groups
Nuclear Fuel Technology*

When: June 4-8, 2012

Where: Paris, France

To participate in the ISO meetings/activities, it is necessary to be appointed as an ANSI Delegate by the U. S. Nuclear Technical Advisory Group Chair, Mr. George Campbell (Phone: 707-882-1640, email: cglen@mcn.org).

More upcoming meetings and workshops listed on page 14.

Workshops and Events

Nuclear Energy Standards Coordination Collaborative Meeting

The Nuclear Energy Standards Coordination Collaborative (NESCC) is a cross-stakeholder forum to identify and respond to the current needs of the nuclear industry. NESCC works to facilitate and coordinate the timely identification, development, and revision of standards for the design, operation, development, licensing, and deployment of nuclear power plants. Standards for other nuclear technologies, including advanced reactor concepts, are also addressed.

The NESCC meeting held on November 29, 2011, included the following topics:

- Nuclear Regulatory Commission standards activities regarding the work of the Concrete and Polymeric Piping Task Groups;
- ASTM International (formerly known as American Society for Testing and Materials (ASTM), National Fire Protection Association, and American Concrete Institute nuclear-related standards updates;
- American Society of Mechanical Engineers standards updates;
- Standards database report;
- Task Group reports from the Concrete Repair Task Group, the Cabling Task Group, the High-Density Polyethylene Piping Task Group, the National Standards Database Priority Task Group; and
- Proposal for a Task Group on Welding Technology and Materials.

For more information on NESCC and to review the meeting reports, please visit the ANSI website at: www.ansi.org.

2012 Chemical Safety and Life Cycle Management Workshop

The Department of Energy's (DOE) Office of Health, Safety and Security (HSS), in coordination with the Environment, Safety and Health (ES&H) Working Group of the Energy Facility Contractors Group (EFCOG), hosted the Annual Chemical Safety and Life Cycle Management Workshop at the DOE Forrestal Building auditorium in Washington, DC, on March 13-15, 2012. The Workshop, *Chemical Safety and Life Cycle Management - Cost Effective Chemical Management*, highlighted cost-effective chemical management considerations and strategies through all phases of the chemical life cycle: acquisition; inventory; and waste handling. Speakers discussed the Globally Harmonized System for hazard communication, as well as hazard analysis for chemical research laboratories. In addition, a 10 CFR 851 session, *Worker Safety and Health Program*, focused on how 10 CFR 851 is implemented across the DOE complex.

In conjunction with this Workshop, the EFCOG/ES&H Working Group held its annual spring meeting. Public sessions covered industrial hygiene, occupational medicine, chemical safety, and radiation protection.

The Workshop was videocast to many DOE sites around the complex. Further information about the Workshop, may be obtained by visiting: http://www.hss.doe.gov/healthsafety/wshp/chem_safety/ws2012/.

For more information, please contact Dan Marsick at 301-903-3954 or Joe Hopkins at 301-903-5619.

DOE Technical Standards Updates

DOE Technical Standards Posted in RevCom for TSP Review

- SAFT-0136, DOE Handbook (HDBK) XXXX-YR, *Accident and Operational Safety Analysis Techniques*
Contact: Dave Pegram, Office of Health, Safety and Security (HSS), Office of Corporate Safety Programs (HS-23)
Phone: 301-903-9840
- TRNG-0080, DOE Standard (STD) XXXX-YR, *Confinement Ventilation and Process Gas Treatment Functional Area Qualification Standard*
Contact: Elaine Diaz, Waste Treatment and Immobilization Plant Engineering Division, Waste Treatment and Immobilization Plant Project, Department of Energy (DOE)
Phone: 509-373-9757
- SAFT-0008, DOE STD XXXX-YR, *Protection Program Defensive Planning*
Contact: Richard Faiver, HSS, Office of Security Policy (HS-51)
Phone: 301-903-4613
- SAFT-0011, DOE STD XXXX-YR, *Incidents of Security Concern Technical Standard*
Contact: Sabeena Khanna, HSS, Office of Security Policy (HS-51)
Phone: 301-903-4681

Part of the TSP mission is to promote the use of voluntary consensus standards, and to manage DOE efforts to develop and maintain necessary technical standards.

DOE Technical Standards Being Revised

- SAFT-0139, DOE STD 1128-YR, *Guide to Good Practices for Occupational Radiological Protection in Plutonium Facilities*
Contact: Peter O'Connell, HSS, Office of Worker Safety and Health Policy (HS-11)
Phone: 202-586-0065
- SAFT-0140, DOE STD 1098-YR, *Radiological Control Standard*
Contact: Judith Foulke, HSS, Office of Worker Safety and Health Policy (HS-11)
Phone: 301-903-5865
- TRNG-0081, DOE STD 1182-YR, *Civil Structural Engineering, Functional Area Qualification Standard*
Contact: Raman Venkata, Office of River Protection, DOE
Phone: 509-376-2274
- CMAN-0005, DOE STD-1073-YR, *Configuration Management*
Contact: Mary Haughey, HSS, Office of Quality Assurance (HS-33)
Phone: 301-903-2867
- SAFT-0141, DOE-HDBK-1092-YR, *Electrical Safety*
Contact: Pat Tran, HSS, Office of Worker Safety and Health Assistance (HS-12)
Phone: 301-903-5638

DOE Technical Standards Recently Approved

- DOE-STD-3013-2012, *Stabilization, Packaging and Storage of Plutonium Bearing Materials*
Contact: Hitesh Nigam, Office of Environmental Management (EM), Office of Packaging and Transportation (EM-33)
Phone: 301-903-7715

Nuclear Safety-Related Standards Activity

By Calvin M. Hopper for the U.S. Department of Energy

This report provides insights into domestic nuclear safety standards development activities with a graded focus on incidental information regarding international standards. Standards that could have current or immediate potential interests to the Department of Energy regarding nuclear facility safety are listed below. Public comment periods for proposed or new standards are typically 30 days.

Proposed Industry Standards

American Nuclear Society (ANS)

Proposed New Standards

- Board of Standards Review (BSR)/ANS 2.31-201x, *Standard for Estimating Extreme Precipitation at Nuclear Facility Sites* (proposed new standard). Addresses extreme natural site hazards associated with precipitation that are applicable to structures, systems, and components in nuclear safety-related facilities with probabilities of exceedence or return periods of wind, flood, and earthquake phenomena. Provides a graded approach to nuclear safety-related facility structures, systems and components phenomena equivalent to seismic design category structures of ANSI/ANS-2.26-2004 (R2010) that are required to be used in design for extreme environmental loads not defined by current ANS or other standard development organization standards.
- BSR/ANS 2.8-201x, *Determine External Flood Hazards for Nuclear Facilities* (proposed new standard to replace withdrawn standard ANSI/ANS-2.8-1992, *Guidelines for Design Basis and Beyond Design Basis External Flood Evaluation at Nuclear Facilities*). Addresses necessary external flood conditions, technical parameters, and applicable methodologies required to evaluate/determine external flooding hazards for nuclear facilities. As a result of recent domestic and international industry events (e.g., the Fukushima Daiichi catastrophe) and increasing demand in risk-informed performance-based regulatory requirements, there is a need to establish methods and technical elements for the determination of external flood hazards, for nuclear power plants and non-reactor nuclear facilities.
- BSR/ANS 2.15-201x, *Criteria for Modeling and Calculating Atmospheric Dispersion of Routine Releases from Nuclear Facilities* (proposed new standard). Establishes criteria for use of

meteorological data collected at nuclear facilities to evaluate the atmospheric effects on routine radioactive releases, inclusive of dilution, dispersion, plume rise, plume meander, aerodynamic effects of buildings, dry, deposition, and wet deposition (e.g., precipitation scavenging).

- BSR/ANS 51.1-200x, *Nuclear Safety Design Criteria for Light Water Reactors* (proposed new standard). Establishes the nuclear safety criteria and functional design requirements of structures, systems, and components of stationary pressurized water reactor power plants.
- BSR/ANS 52.1-200x, *Nuclear Safety Criteria for the Design of Stationary Boiling Water Reactor Plants*, (proposed new standard). Establishes the nuclear safety criteria and functional design requirements of structures, systems, and components of stationary boiling water reactor power plants.

Proposed Revisions

- BSR/ANS 15.21-201x, *Format and Content for Safety Analysis Reports for Research Reactors* (revision of ANSI/ANS 15.21-1996 (R2006)). Identifies and establishes the content of technical specifications for research and test reactors.

American Concrete Institute (ACI)

Proposed New Standards

- BSR/ACI 359-200x, *Code for Concrete Reactor Vessels and Containment* (proposed revision of BSR/ACI 359-1992). Also known as ASME, Boiler & Pressure Vessel Code, Section III, Division 2. Identifies requirements for concrete reactor vessel construction.

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PROPOSED INDUSTRY STANDARDS

American Society of Mechanical Engineers (ASME)*Proposed Revisions*

- BSR/ASME Boiler & Pressure Vessel Code (BPVC) Section XI-201x, *Rules for In-service Inspection of Nuclear Power Plant Components* (proposed revision of ANSI/ASME BPVC Section XI-2010). Provides requirements for in-service inspection and testing of light-water cooled nuclear power plants. The requirements identify the areas subject to inspection, responsibilities, provisions for accessibility and inspectability, examination methods, and procedures, personnel qualifications, frequency of inspection, record keeping and report requirements, procedures for evaluation of inspection results and subsequent disposition of results of evaluations, and repair/replacement activity requirements, including procurement, design, welding, brazing, defect removal, fabrication, installation, examination, and pressure testing.
- BSR/ASME BPVC Section III-201x, *Rules for Construction of Nuclear Facility Components* (proposed revision of ANSI/ASME BPVC Section III-2010). Contains the requirements for the design, construction, stamping, and overpressure protection of items used in nuclear power plants and other nuclear facilities. Also consists of the following divisions:
 - Division 1: Metallic vessels, heat exchangers, storage tanks, piping systems, pumps, valves, core support structures, supports, and similar items;
 - Division 2: Concrete containment vessels; and
 - Division 3: Metallic containment systems for storage or transportation of spent nuclear fuel and high-level radioactive materials and waste.
- BSR/ASME NuG-1-201x, *Graphite Core Components for Nuclear Power Plants* (proposed revision of ANSI/ASME A112.19.14M-2001). Establishes codes, standards, and guides for materials selection and qualification, design, fabrication, testing, installation, examination, inspection, certification, and the preparation of reports for manufacture and installation of non-metallic internal components for graphite-moderated fission reactors.

ASTM International (formerly known as American Society for Testing and Materials (ASTM))*Work Items Draft Under Development**5-Year Review*

- WK36513, *Standard Test Method for The Radiochemical Determination of Americium-241 in Soil by Alpha Spectrometry* (revision of ASTM C1205-07). Provides the speed and high decontamination factors attainable with liquid-liquid extraction of the actinides and eliminates filtration techniques that are more time consuming. Provides a precise determination of americium in concentrations normally found in environmental samples.
- WK36514, *Standard Test Method for Radiochemical Determination of Strontium-90 in Soil* (revision of ASTM C1507-07e1). Applicable to the determination of strontium-90 in soil at levels of detection dependent on count time, sample size, detector efficiency, background, and recovery.
- WK36430, *Standard Guide for Establishing a Measurement System Quality Control Program for Analytical Chemistry Laboratories Within the Nuclear Industry* (revision of ASTM C1210-06). Provides guidance for establishing and maintaining a measurement system quality control program.
- WK36356, *Standard Guide for Preparation of Working Reference Materials for Use in Analysis of Nuclear Fuel Cycle Materials* (revision of ASTM C1128 - 01(R2008)). Covers the preparation and characterization of working reference materials (WRM) that are produced by a laboratory for its own use in the analysis of nuclear materials. Guidance is provided for establishing traceability of WRMs to certified reference materials by a defined characterization process.
- WK36212, *Standard Test Method for the Determination of Impurities in Plutonium Metal: Acid Digestion and Inductively Coupled Plasma-Mass Spectroscopy Analysis* (revision of ASTM C1637-06). Covers the determination of 58 trace elements in plutonium (Pu) metal.

Proposed Revisions

- WK35854, *Standard Test Method for Plutonium by Controlled-Potential Coulometry* (revision of ASTM

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PROPOSED INDUSTRY STANDARDS

C1108-99 (R2006)). Revision is intended to bring the standard up to date with current practices used by the laboratories using the standard and to address comments and questions on the standard.

- WK35742, *Standard Test Methods for Chemical, Mass Spectrometric, and Spectrochemical Analysis of Nuclear-Grade Boron Carbide* (revision of ASTM C791-04 (R2011)). Additional revisions are needed to cover procedures for the chemical, mass spectrometric, and spectrochemical analysis of nuclear-grade boron carbide powder and pellets to determine compliance with specifications.
- WK35650, *Standard Specification for Uranium Ore Concentrate* (revision of ASTM C967-08). Revisions needed in Sections 4.6, 9.3, and Table 1.
- WK35600, *Standard Specification for Sintered (Uranium-Plutonium) Dioxide Pellets* (revision of ASTM C833-01 (R2008)). Being revised to correct errors and define different grades of pellets for different plutonium isotopics. Covers finished sintered and ground (uranium-plutonium) dioxide pellets for use in thermal reactors.

Proposed Withdrawal

- WK35951, *Standard Practice for Sampling Special Nuclear Materials in Multi-Container Lots* (withdrawal of ASTM C970 - 87(R2006)). Being balloted for withdrawal with no replacement because it is no longer used or relevant within the industry.

National Fire Protection Association (NFPA)

Proposed Revisions

- BSR/NFPA 801-201x, *Standard for Fire Protection for Facilities Handling Radioactive Materials* (proposed revision of ANSI/NFPA 801-2008). Addresses fire-protection requirements intended to reduce the risk of fires and explosions at facilities handling radioactive materials. These requirements are applicable to all locations where radioactive materials are stored, handled, or used in quantities and under conditions requiring government oversight and/or license to possess or use these materials, and to all other locations with equal quantities or conditions.

- BSR/NFPA 25-201x, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems* (revision of ANSI/NFPA 25-2011). Provides the latest requirements for the care of sprinkler systems including fixed water spray and foam-water systems, standpipe and hose systems, fire pumps, piping and appurtenances, and water storage tanks.

Institute of Electrical and Electronics Engineers (IEEE)

Proposed New Standards

- BSR C63.20-201x, *EMC Immunity Qualification of Instrumentation and Control Equipment and Systems Intended for Use in Nuclear Power Stations* (proposed new standard). Will provide immunity test methods, levels, and recommended acceptance criteria for instrumentation and control equipment and systems intended for use in nuclear power plants.
- BSR N42.58-201x, *Performance Criteria for Portable Contamination Monitoring Instrumentation for Nuclear and Radiological Emergencies* (proposed new standard). Defines and establishes performance requirements and performance testing requirements for portable contamination monitoring instruments used for radiological emergencies.
- BSR/IEEE 692a-201x, *Standard Criteria for Security Systems for Nuclear Power Generating Stations - Amendment A: Alignment with Recent Industry Security Approach Changes* (proposed new standard). Establishes criteria for the design of an integrated security system for nuclear power generating stations. These criteria assist in the selection and application of equipment to detect, monitor, display, and record security conditions and events.
- BSR N42.49B-201x, *Performance Criteria for Non-alarming Personal Emergency Radiation Detectors (PERDs) for Exposure Control* (proposed new standard). Establishes minimum performance criteria and test requirements for non-alarming radiation detectors used to manage the exposure of emergency responders (including fire services, law enforcement, and medical services) to photon radiation.

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PROPOSED INDUSTRY STANDARDS

- BSR/IEEE 29119-1,-2,-3,-4-201x, *Standard for Software and Systems Engineering - Software Testing - Part 1: Concepts and Definitions, - Part 2: Test Process, - Part 3: Test Documentation, and - Part 4: Test Techniques* (proposed new standard). Covers the following:
 - *Part 1: Concepts and Definitions:* Testing of software-intensive systems. Supports testing across the entire software development life cycle, from static testing of requirements, specifications and other documentation, unit or component testing that is typically carried out by developers, integration testing of program modules, system testing of integrated systems, and user acceptance testing that is usually carried out by end-users. It also supports testing during maintenance cycles that typically occur after release.
 - *Part 2: Test Process:* Software testing processes, for use by any organization, project, or smaller testing activity (e.g., a maintenance testing activity). Covers testing processes that support all software development life cycle models, including waterfall, spiral and agile models of development. Also comprises test process descriptions and diagrams that define the software testing processes for use by any organization, team, or individual.
 - *Part 3: Test Documentation:* Software test documentation templates and content for use by any organization and/or project. Defines the use and contents of software test documentation used throughout the defined multi-layer test process. Test documentation is identified for the three layers of the test process: Organizational Test Process; Test Management Processes; and Dynamic Test Processes.
 - *Part 4: Test Techniques:* Supports test case design and execution during any phase or type of testing (e.g., unit, integration, system, acceptance, performance, usability, reliability).

Proposed Revisions

- BSR/IEEE 7-4.3.2-201x, *Standard Criteria for Digital Technology in Safety Systems of Nuclear Power Generating Stations* (proposed revision of ANSI/IEEE 7-4.3.2-2010). Amplifies criteria in IEEE Standard 603-2009, *IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations*, to address

the use of computers as part of safety systems in nuclear power generating stations. Establishes minimum functional and design requirements for computers used as components of a safety system.

- BSR/IEEE 946-201x, *Recommended Practice for the Design of DC Auxiliary Power Systems for Generating Stations* (proposed revision of ANSI/IEEE 946-2005). Provides guidance for the design of the DC auxiliary power systems for nuclear and non-nuclear power generating stations.
- BSR/IEEE 650-201x, *Standard for Qualification of Class 1E Static Battery Chargers, Inverters and Uninterruptible Power Supply (UPS) Systems for Nuclear Power Generating Stations* (proposed revision of ANSI/IEEE 650-2006). Provides the methods of qualifying class 1E static battery chargers and inverters in accordance with IEEE Standard 323-1983, *IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations*.

International Organization for Standardization (ISO)**Proposed New Standards Under Development**

- ISO/Draft International Standard (DIS) 16424, *Nuclear Energy - Evaluation of Homogeneity of Gd Distribution within Gadolinium Fuel Blends and Determination of Gd₂O₃ Content in Gadolinium Fuel Pellets by Measurements of Uranium and Gadolinium Elements* (proposed new standard). Comment period ends 3/23/2012.
- ISO/Committee Draft (CD) 12749-2, *Nuclear Energy - Vocabulary - Part 2: Radiological Protection* (proposed new standard). Comment period ends 12/02/12. Intends to facilitate communication and promote common understanding of unambiguous terms and definitions related to radiation protection concepts in the subject field of nuclear energy.
- ISO/New Work Item Proposal (NP) 12749-3, *Nuclear Energy - Vocabulary - Part 3: Nuclear Fuel Cycle* (proposed new standard under development). Intends to facilitate communication and promote common understanding of unambiguous terms and definitions related to nuclear fuel cycle concepts in the subject field of nuclear energy.

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PROPOSED INDUSTRY STANDARDS

Proposed Revisions Under Development

- ISO/DIS 19238, *Radiation Protection - Performance Criteria for Service Laboratories Performing Biological Dosimetry by Cytogenetics* (proposed revision to ISO 19238:2004). Provides criteria for quality assurance and quality control, evaluation of the performance, and the accreditation of biological dosimetry by cytogenetic service laboratories. Comment period ends 04/07/12.
- ISO/ASTM DIS 51276, *Practice for Use of a Polymethylmethacrylate Dosimetry System* (proposed revision of ISO/ASTM 51276:2002). Covers procedures for using hermetically sealed polymethylmethacrylate dosimeters for measuring absorbed dose in materials irradiated by photons or electrons in terms of absorbed dose in water.
- ISO/ASTM CD 52116, *Practice for Dosimetry for a Self-Contained Dry-Storage Gamma-Ray Irradiator* (proposed revision of ISO/ASTM 52116:2002). Outlines dosimetric procedures to be followed with self-contained dry-storage gamma-ray irradiators.
- ISO/ASTM CD 51631, *Practice for Use of Calorimetric Dosimetry Systems for Electron Beam Dose Measurements and Dosimeter Calibrations* (proposed revision of ISO/ASTM 51631:2003). Covers the preparation and use of semi-adiabatic calorimeters for measurement of absorbed dose and routine dosimeter calibration when irradiated with electrons for radiation processing applications.
- ISO/ASTM CD 51940, *Guide for Dosimetry for Sterile Insects Release Programs* (proposed revision of ISO/ASTM 51940:2004 (Ed. 2)). Outlines dosimetric procedures to be followed for the radiation sterilization of live insects for use in pest management programs.
- ISO/ASTM CD 51702, *Practice for Dosimetry in a Gamma Irradiation Facility for Radiation Processing* (proposed revision for ISO/ASTM 51702:2004). Outlines the installation qualification program for an irradiator and the dosimetric procedures to be followed during operational qualification, performance qualification, and routine processing in facilities that process product with ionizing radiation from radionuclide gamma sources to ensure that product has been treated within a

predetermined range of absorbed dose. Other procedures related to installation qualification, operational qualification, performance qualification, and routine processing that may influence absorbed dose in the product are also discussed.

International Atomic Energy Agency (IAEA)

Draft standards currently posted for official comment by Member States

- DS446, *Commissioning for Nuclear Power Plants* (revision of Safety Guide No. NS-G-2.9 *Commissioning for Nuclear Power Plants (2003)*). Makes recommendations for those involved in the nuclear power plants commissioning process based on recent good and proven practices to ensure the activities undertaken during this phase are conducted safely and with high quality, and to demonstrate that the plant is constructed and commissioned as per design intent and can be operated with a high degree of safety during its lifetime.
- DS439, *Addendum to NS-R-5, Appendix IV: Reprocessing Facilities and Appendix V: Fuel Cycle Research and Development Facilities*. Comment period ends 05/29/12. Establishes the safety requirements for fuel cycle facilities, including conversion, enrichment, fabrication of fuel, spent fuel storage, spent fuel reprocessing and associated waste conditioning and storage, and fuel cycle research and development facilities.
- DS401, *Application of the Principle of Justification to Practices, including Non-Medical Imaging*. Comment period ends 06/07/12. Provides guidance to national authorities on the application of the principle of justification to proposed practices for radiation protection with the use of x-rays for security screening and the use of radioactive material in consumer products.

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NEW AND REVISED STANDARDS**New and Revised Standards****American Nuclear Society (ANS)****Newly Approved Standards**

- ANSI/ANS 53.1-2011, *Nuclear Safety Design Process for Modular Helium-Cooled Reactor Plants* (new standard): 12/21/2011. Defines the nuclear safety criteria and the design process for a liquid-sodium-cooled reactor plant that is required to support the development of the next generation of nuclear power plants using this technology.
- ANSI/ANS 41.5-2012, *Verification and Validation of Radiological Data for Use in Waste Management and Environmental Remediation* (new standard): 2/15/2012. Establishes criteria and processes for determining the validity of radioanalytical data for waste management and environmental remediation. These applications include site characterization, waste acceptance, waste certification, waste treatment design, process control, risk communication, litigation, and other applications as deemed necessary.

American Institute of Steel Construction (AISC)**Newly Approved Revision**

- ANSI/AISC N690-2012, *Specification for Safety-Related Steel Structures for Nuclear Facilities* (revision of ANSI/AISC N690-2006): 1/31/2012. An update to ANSI/AISC N690-06, this version uses the 2010 AISC *Specification for Structural Steel Buildings* as a baseline document and modifies specific portions to make it applicable to the design, fabrication, and erection of safety-related steel structures for nuclear facilities.

ASTM International (formerly known as American Society for Testing and Materials (ASTM))**Newly Approved Standards**

- ASTM C1752-2011, *Standard Guide for Measuring Physical and Rheological Properties of Radioactive Solutions, Slurries, and Sludges* (new standard): 09/01/11. Provides guidance for the measurement and calculation of physical and rheological properties of radioactive solutions, slurries, and sludges as well as simulants designed to model the properties of these radioactive materials.

- ASTM C791-2011, *Standard Test Methods for Chemical, Mass Spectrometric, and Spectrochemical Analysis of Nuclear-Grade Boron Carbide* (new standard): 07/01/11. Test methods cover procedures for the chemical, mass spectrometric, and spectrochemical analysis of nuclear-grade boron carbide powder and pellets to determine compliance with specifications.

Newly Approved Revisions

- ASTM D7301-2011, *Specification for Nuclear Graphite Suitable for Components Subjected to Low Neutron Irradiation Dose* (revision of ANSI/ASTM D7301-2008): 10/01/12. Covers the classification, processing, and properties of nuclear grade graphite billets with dimensions sufficient to meet the designer's requirements for reflector blocks and core support structures, in a high temperature gas cooled reactor.
- ASTM C696-2011, *Standard Test Methods for Chemical, Mass Spectrometric, and Spectrochemical Analysis of Nuclear-Grade Uranium Dioxide Powders and Pellets* (replaces ASTM C696-99(2005)): 09/01/11. Provides test methods to cover procedures for the chemical, mass spectrometric, and spectrochemical analysis of nuclear-grade uranium dioxide powders and pellets to determine compliance with specifications.
- ASTM C799-2012, *Standard Test Methods for Chemical, Mass Spectrometric, Spectrochemical, Nuclear, and Radiochemical Analysis of Nuclear-Grade Uranyl Nitrate Solutions* (revision of ASTM C799-99): 01/01/12. These test methods cover procedures for the chemical, mass spectrometric, spectrochemical, nuclear, and radiochemical analysis of nuclear-grade uranyl nitrate solution to determine compliance with specifications.
- ASTM C968-12 *Standard Test Methods for Analysis of Sintered Gadolinium Oxide-Uranium Dioxide Pellets* (revision of ASTM C968-06): 01/01/12. These test methods cover procedures for the analysis of sintered gadolinium oxide-uranium dioxide pellets to determine compliance with specifications.
- ASTM C1169-2012, *Standard Guide for Laboratory Evaluation of Automatic Pedestrian Special Nuclear Material Monitor Performance* (revision of ASTM

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NEW AND REVISED STANDARDS

- C1169-97): 01/01/12. To compare the performance of different Special Nuclear Material (SNM) pedestrian monitors operating in a specific laboratory environment and to provide relative information on the capability of monitors to search pedestrians for small quantities of concealed SNM under characterized conditions.
- ASTM C1238-2012, *Standard Guide for Installation of Walk-Through Metal Detectors* (revision of ASTM C1238-97): 01/01/12. For use by the designers, evaluators, and users of walk-through metal detectors to be installed to screen persons entering or leaving a controlled access area. This guide is not meant to constrain design liberty but is to be used as a guide in the selection of location and installation of walk-through metal detectors.
 - ASTM C1269-2012, *Standard Practice for Adjusting the Operational Sensitivity Setting of In-Plant Walk-Through Metal Detectors* (revision of ASTM C1269-97(2003)): 01/01/12. Covers a procedure for adjusting the operational sensitivity of in-plant walk-through metal detectors.
 - ASTM C1270-2012, *Standard Practice for Detection Sensitivity Mapping of In-Plant Walk-Through Metal Detectors* (revision of ASTM C1270-97(2003)): 01/01/12. Covers a procedure for determining the weakest detection path through the portal aperture and the worst-case orthogonal orientation of metallic test objects.
 - ASTM C1309 - *Standard Practice for Performance Evaluation of In-Plant Walk-Through Metal Detectors* (revision of ASTM c1309-97): 01/01/12. Assists operators of nuclear facilities with meeting the metal detection performance requirements set by regulatory authorities.
 - ASTM C1571-2012, *Standard Guide for Characterization of Radioactive and/or Hazardous Wastes for Thermal Treatment* (revision of ASTM C1571-03): 01/01/12. Identifies methods to determine the physical and chemical characteristics of a variety of hazardous and/or radioactive wastes including heavy metal contaminated wastes.
 - ASTM C751-2012, *Standard Specification for Nuclear-Grade Boron Carbide Pellets* (revision of ASTM C751-07): 01/01/12. Applies to boron carbide pellets for use as a control material in nuclear reactors.
 - ASTM C784-2012, *Standard Specification for Nuclear-Grade Aluminum Oxide-Boron Carbide Composite Pellets* (revision of ASTM C784-05): 01/01/12. Applies to composite pellets composed of mixtures of nuclear-grade aluminum oxide and boron carbide that may be ultimately used in a reactor core, for example, in neutron absorber rods.
 - ASTM C993-2012, *Standard Guide for In-Plant Performance Evaluation of Automatic Pedestrian Special Nuclear Materials Monitors* (revision of ASTM C993-97): 01/01/12. A guide to in-plant performance evaluation to quickly verify whether a pedestrian Special Nuclear Materials (SNM) monitor performs as expected for detecting SNM or SNM-like test sources.

Health Physics Society (HPS)

HPS Accredited Standards Committee, N13 develops consensus standards dealing with or pertaining to radiation protection, including the protection of individuals or groups from occupational or environmental exposure to radiation or radioactive materials. Accredited Standards Committee N43 is concerned with radiation protection aspects of radiation-producing equipment used in industrial and nonmedical research and development activities (excluding nuclear reactors).

Newly Approved Standards

- ANSI N2.1-2011, *Radiation Symbol* (new standard): 10/17/2011. Designates a radiation symbol that shall be used to signify the actual or potential presence of ionizing radiation and to identify objects, devices, materials, or combinations of materials that emit ionizing radiation.
- ANSI N13.41-2011, *Criteria for Performing Multiple Dosimetry* (new standard): 10/17/2011. Provides criteria for when and how to use multiple dosimeters under conditions incident to routine activities in the presence of ionizing radiation, as well as the recommended methodology for determining the effective dose equivalent when the use of multiple dosimeters has been deemed necessary by radiation protection professionals.

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NEW AND REVISED STANDARDS

- ANSI N43.1-2011, *Radiation Safety for the Design and Operation of Particle Accelerators* (new standard): 11/9/2011. Covers all phases of a non-medical accelerator facility including design, installation, commissioning, operation, upgrade, and decommissioning.
- ANSI N13.30-2011, *Performance Criteria of Radiobioassay* (new standard): 12/9/2011. Provides criteria for radiobioassay service laboratory quality assurance, performance evaluation, and accreditation including: determining bias, precision, and minimum detectable amount of a procedure; testing ranges and limits of bias and precision to be used in an accreditation program; and guidance for users, providers, and regulators.

International Organization for Standardization (ISO)**Newly Approved Standard**

- ISO 17874-3:2011, *Remote Handling Devices For Radioactive Materials - Part 3: Electrical Master-Slave Manipulators* (new standard): 10/28/11. Specifies the main features of electrical master-slave manipulators intended to be used for nuclear applications. Outlines basic principles which relate to the design features of electrical master-slave manipulators for applications both inside and outside nuclear plant buildings.

International Electrotechnical Commission (IEC)Technical Committee 45, *Nuclear Instrumentation***Recently Published Standards**

- IEC 61577-3 Ed. 2.0 b:2011, *Radiation Protection Instrumentation - Radon and Radon Decay Product Measuring Instruments - Part 3: Specific Requirements for Radon Decay Product Measuring Instruments*: 12-09-11. Describes the specific requirements for instruments measuring the volumetric activity of airborne short-lived radon decay products and/or their ambient potential alpha-energy concentration outdoors, in dwellings, and in workplaces including underground mines. Applies practically to all types of electronic instruments that are based on grab sampling, continuous sampling technique and electronic integrating measurement methods. This new edition includes the following significant

technical changes with respect to the previous edition:

- Implementation of new requirements and tests concerning radiation detection performance;
- Implementation of new requirements and tests concerning environmental performance; and
- Harmonization of the requirements and tests concerning electrical and mechanical performance with other standards in the area of radiation protection instrumentation.
- IEC 62566 Ed.1.0 b:2012, *Nuclear Power Plants - Instruments and Control Important to Safety - Development of HDL-programmed integrated circuits for Systems Performing Category A Functions*: 01/26/12. Provides requirements for achieving highly reliable Hardware Description Languages (HDL)-Programmed Devices (HPD), for use in instrumentation and control systems of nuclear power plants performing functions of safety category A as defined by IEC 61226. The programming of HPDs relies on related software tools. They are typically based on blank field-programmable gate arrays or similar micro-electronic technologies.

International Atomic Energy Agency (IAEA)**Recently Published Standards**

- IAEA Safety Standards Series No. SSR-2/1: *Safety of Nuclear Power Plants: Design*: 02/20/12. Establishes design requirements for the structures, systems, and components of a nuclear power plant, as well as for procedures and organizational processes important to safety, that are required to be met for safe operation and for preventing events that could compromise safety, or for mitigating the consequences of such events, were they to occur.
- IAEA Safety Standards Series No. SSG-17: *Control of Orphan Sources and Other Radioactive Material in the Metal Recycling and Production Industries*: 02/10/12. Provides recommendations to governments and national authorities, including regulatory bodies, on applying the fundamental safety principles by meeting the safety requirements in relation to the control of radioactive material

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STANDARDS DEVELOPMENT ORGANIZATIONS

in scrap metal and metal products that may enter the metal recycling supply chain. It applies to all operations in the handling of scrap metal for recycling and the subsequent processing of this material.

- IAEA Safety Standards Series No. SSG-16: *Establishing the Safety Infrastructure for a Nuclear Power Programme Specific Safety Guide*: 01/19/12. Covers all the relevant IAEA safety requirements to be incorporated into an effective safety infrastructure for the first three phases of a nuclear power program, including:
 - Phase 1: Addressing necessary safety infrastructure before deciding to launch a nuclear power program;
 - Phase 2: Addressing necessary safety infrastructure for preparatory work for the construction of a nuclear power plant; and
 - Phase 3: Addressing necessary safety infrastructure during construction and commissioning of the first nuclear power plant.
- IAEA Safety Standards Series No. SSG-18: *Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations*: 12/01/11. Provides guidance on the assessment of hazards associated with meteorological and hydrological phenomena external to nuclear installations over their entire lifetime, from the survey and detailed site investigation stages during the site selection process, from which the design bases are derived, until the end of the operational period.
- IAEA Safety Standards Series No. GSR Part 3 (Interim): *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards - Interim Edition*: 11/03/11. Establishes requirements to be fulfilled in all facilities and activities/situations involving radiation exposure that is amenable to control, such as nuclear installations, radioactive waste management facilities, and the transport of radioactive material. These standards apply to the following three categories of exposure: occupational exposure; public exposure; and medical exposure.

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PROGRAM INFORMATION

Upcoming Meetings and Workshops

**ISO - Project Committee Meeting:
Sustainability Criteria for Bioenergy**

When: April 16-20, 2012
Where: Argonne, IL

**2012 IEEE 9th International Symposium
on Biomedical Imaging**

When: May 2-5, 2012
Where: Barcelona, Spain

ASME 2012 Annual Meeting

When: June 2-6, 2012
Where: Montreal, Quebec Canada

**June 2012 Committee Week:
Nuclear Fuel Cycle**

When: June 24-28, 2012
Where: San Diego, CA

**2012 ANS Annual Meeting - Nuclear Science
and Technology: Managing the Global Impact
of Economic and Natural Events**

When: June 24-28, 2012
Where: Chicago, IL

ASTM Meeting

When: June 25, 2012
Where: San Diego, CA

**Institute of Nuclear Materials Management
53rd Annual Meeting**

When: July 15-19, 2012
Where: Orlando, FL

57th Annual Health Physics Society Meeting

When: July 22-26, 2012
Where: Sacramento, CA

TECHNICAL STANDARDS PROGRAM

- **Promotes** the use of voluntary consensus standards at DOE.
- **Manages** and facilitates DOE efforts to develop and maintain necessary technical standards when voluntary consensus standards do not meet DOE needs.
- **Communicates** information on national consensus and departmental technical standards activities to developers and users of technical standards in DOE.

TECHNICAL STANDARDS PROGRAM MISSION

Mission

To enhance DOE's transition to a standards-based culture by providing information, coordinating activities, and promoting the use of consensus standards, and when needed, the development of DOE technical standards.

FOR MORE INFORMATION

To learn more about the DOE Technical Standards Program or to view the *Standards Actions* Newsletters, go to:
www.hss.energy.gov/nuclearsafety/ns/techstds/.

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