

# Standards Actions

Technical Standards Program Newsletter

July 2011



U.S. DEPARTMENT OF

**ENERGY**

OFFICE OF  
NUCLEAR SAFETY



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## FEATURED DOE TECHNICAL STANDARDS ACTIVITIES

### DOE Standard 1020 Revision

Department of Energy (DOE) Standard (STD) 1020-2011, *National Phenomena Hazards Design and Evaluation Criteria for DOE Facilities*, provides criteria and guidance for the analysis and design of facility structures, systems, and components (SSCs) that are necessary for implementing the requirements of DOE Order (O) 420.1C, *Facility Safety*, to ensure that the SSCs will be able to perform their intended safety functions effectively under the effects of Natural Phenomena Hazards (NPHs). The focus of the revision to this standard is on the analysis and design of new facilities. For existing facilities, evaluations of seismic capabilities should have already been performed utilizing a previous version of the standard and other related NPH standards. Therefore, use of this revised standard in any new NPH evaluations for existing facilities is not mandatory, and is at the discretion of the DOE Program Office. In addition, the revision provides supplemental criteria and guidance relative to seismic hazards (beyond and/or supporting that provided in the industry standards), and new criteria and guidance for analysis and design of

SSCs for lightning, snow, and volcanic eruption events.

The revised DOE-STD-1020 will provide criteria and guidance for the use of industry building codes and voluntary consensus standards in the NPH analysis and design of SSCs in DOE facilities. In particular, it will provide criteria and guidance for:

1. Establishing the performance requirements for SSCs in terms of parameters that define failure of their safety functions (e.g., the state of deformation or Limit State), and gradation of SSCs into more than one NPH design category based on the consequences of SSC failure when subjected to NPH events;
2. Calculating maximum NPH demands on SSCs resulting from NPH events in terms of parameters that define failure of their safety functions; and
3. Design (or, for existing facilities, design evaluation) of SSCs to ensure their ability to maintain required functionality when subjected to demands from NPH events.

*(Continued on page 2)*

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Prior to this revision of DOE-STD-1020, DOE used the DOE NPH Guide and DOE Standards listed below to support implementation of the NPH requirements of DOE O 420.1C. Due to the recent development and issuance of several voluntary consensus standards by the nuclear industry within the professional organizations that address DOE NPH analysis and design needs, these documents have been withdrawn, and the pertinent information has been re-located (i.e., seismic, wind, and flood provisions are replaced by new criteria and guidance) to the new revised DOE-STD-1020 as discussed below.

- DOE Guide 420.1-2, *Guide for the Mitigation of Natural Phenomena Hazards for DOE Nuclear and Non-Nuclear Facilities*: Most of the guidance was no longer needed and any remaining applicable guidance was incorporated into the revision of DOE-STD-1020.
- DOE-STD-1021-93, *Natural Phenomena Hazards Performance Categorization Criteria for Structures, Systems, and Components*: The seismic categorization provisions of this standard are replaced by American National Standards Institute (ANSI)/American Nuclear Society (ANS)-2.26-2004, *Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design*.
- DOE-STD-1022-94, *Natural Phenomena Hazards Site Characterization Criteria*: The seismic site characterization provisions of this standard are replaced by ANSI/ANS-2.27-2008, *Criteria for Investigation of Nuclear Facility Sites for Seismic Hazard Assessment*, as specified in the revision of DOE-STD-1020.
- DOE-STD-1023-95, *Natural Phenomena Hazards Assessment Criteria*: The seismic hazard assessment provisions of this standard are replaced by ANSI/ANS-2.29-2008, *Probabilistic Seismic Hazards Analysis*, as specified in this revision of DOE-STD-1020.

The retired DOE Standards will be available for reference on the Technical Standards Program webpage archive.

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## DOE Standard 1090 Revision

Department of Energy (DOE) Standard 1090-2007, *Hoisting and Rigging*, is undergoing a significant revision to incorporate, by reference, applicable American Society of Mechanical Engineers (ASME) standards addressing cranes and other lifting equipment. The revision will also reflect Occupational Safety and Health Administration's (OSHA) recent rulemaking for cranes and derricks in construction. The DOE Hoisting and Rigging Technical Advisory Committee (HRTAC) completed an internal review in early March 2011, and the draft has been posted to Technical Standards Program (TSP) RevCom for review and comment by the broader DOE community. All comments will be discussed thoroughly by the HRTAC at their upcoming annual meeting in Idaho Falls, ID on July 20, 2011. Full resolution of all comments is expected by August 1, 2011, after which the approved, revised DOE technical standard will be published on the TSP website.

This standard, originally published as a manual in 1980, not only references applicable national consensus and OSHA standards but addresses a number of areas not addressed within such national standards, including special requirements for critical lifts; pre-engineered production lifts; and the use, inspection, and maintenance of lifting equipment in hostile work environments. It is used widely within the DOE community as either a mandatory contract document, a reference guide, or as a training tool, and it has been the focal point of ongoing efforts by the HRTAC to improve the safety of hoisting and rigging activities within the DOE since its introduction over 30 years ago.

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# DOE Technical Standards Updates

## New Projects and DOE Technical Standards in Revision

### DOE New Projects:

- TRNG-0080, *Confinement Ventilation and Process Gas Treatment Functional Area Qualification Standard*  
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## DOE Technical Standards Posted in RevCom for TSP

- TRNG-0079, DOE-STD-1179-YR, *Technical Training Functional Area Qualification Standard*  
**Contact:** Mark Alsdorf, National Nuclear Security Association  
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- SAFT-0134, DOE-STD-XXXX-YR, *Explosives Safety*  
**Contact:** Gerald Meyers, Office of Health, Safety and Security (HSS), Office of Nuclear Safety Basis and Facility Design (HS-31)  
**Phone:** 301-903-3190
- NPHZ-0003, DOE-STD-1020-YR, *National Phenomena Hazards Design and Evaluation Criteria for DOE Facilities*  
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- SAFT-0130, DOE-STD-1090-YR, *Hoisting and Rigging*  
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## DOE Technical Standards in Reaffirmation

None for May or June.

## DOE Technical Standards Change Notices

None for May or June.

## DOE Technical Standards Published

- SAFT-0128, Revision of DOE-STD-1195-2011, *Design of Safety Significant Safety Instrumented Systems used at DOE Nonreactor Nuclear Facilities*  
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- ENVR-0010, DOE-STD-1196-2011, *Derived Concentration Technical Standard*  
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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.

## Workshops and Events

### 2011 Joint EFCOG/DOE Chemical Safety and Lifecycle Management Workshop

The Department of Energy (DOE) and the Energy Federal Contractors Group (EFCOG) held its Thirteenth Annual Joint Chemical Safety and Lifecycle Management (CSLM) Workshop in conjunction with EFCOG Environment Safety and Health (ESH) Group Spring Meeting from March 22-24, 2011, in the DOE Forrestal building. This year's theme, "Keeping Chemicals Safe and Secure," focused on the security of chemicals as a key means of worker and community protection. Topical highlights included global harmonization, performance indicators, chemical transportation, chemical inventory automation, and chemical security.

Over 140 participants attended the CSLM workshop either in person or by telecast from 16 sites throughout the DOE complex. Three special guests opened the workshop:

1. Glenn Podonsky, Office of Health, Safety and Security;
2. Anthony Umek, Savannah River Nuclear Solutions and EFCOG ESH Working Group Chairman; and
3. Dr. John Mansfield, Defense Nuclear Facilities Safety Board.

Mr. Podonsky provided the DOE Corporate welcome and presented "DOE's Perspective on Chemical Safety and Security." Mr. Umek provided the EFCOG Corporate welcome and presented "Looking at the Whole Picture: Chemical Security." Mr. Umek stressed the critical importance of the chemical life cycle management to the implementation of Integrated Safety Management (ISM) and discussed the consequences of ineffective chemical management.

Dr. Mansfield presented "Strong Regulation and a Safer Workplace" and spoke about the BP Deepwater Horizon oil spill (April 2010) and the need for strong regulation.

During two days of presentations and training, ten speakers from the Federal and private sectors offered insight into the management of chemical security in both an industrial and government setting. Topics discussed included:

- Responsible Care Program;
- European Union regulations;
- U.S. chemical security regulations and voluntary programs;
- Enterprise ISM System;
- Globally Harmonized System;
- Chemical transportation; and
- Human and corporate performance indicators.

The final day of the event featured a 10 CFR 851 Workshop which included discussions on lockout/tagout regulations and their implementation, and new provisions of the Occupational Safety and Health Administration's Cranes and Derricks Rule.

***For general information about the chemical management initiative, go to the HSS website at:***  
[www.energy.gov/safetyhealth/chemicalsafety.htm](http://www.energy.gov/safetyhealth/chemicalsafety.htm).

***For additional information from or about the workshop, go to:*** [www.hss.energy.gov/HealthSafety/WSHP/chem\\_safety/ws2011/](http://www.hss.energy.gov/HealthSafety/WSHP/chem_safety/ws2011/).

# 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)

#### Revisions

- o ANS 3.4-201x, *Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants* (revision of American National Standards Institute (ANSI)/ANS 3.4-1996 (R2002)). Defines and updates the medical, psychological, and physical requirements for licensing of nuclear power plant reactor operators and senior operators. This standard also addresses the content, extent, methods of examination, and continual monitoring of licensed operators' medical health.
- o ANS 8.20-201x, *Nuclear Criticality Safety Training for Fissionable Materials Operations Outside Reactors* (revision of ANSI/ANS 8.20-1991 (R2005)). Provides criteria for nuclear criticality safety training for operations with fissionable materials outside reactors.
- o ANS 58.8-201x, *Time Response Design Criteria for Safety-Related Operator Actions* (revision of ANSI/ANS 58.8-1994 (R2008)). Establishes time-response criteria for safety-related operator actions to be used in the design and evaluation of light water reactor (LWR) nuclear power plants. The criteria are used:
  - (1) to determine the minimum response time intervals for safety related operator actions that are taken to mitigate design basis events (DBEs); and
  - (2) to validate operator actions requirements for DBEs and Special Events.
- o ANS 3.2-201x, *Administrative Controls for the Operational Phase of Nuclear Power Plants* (revision of ANSI/ANS 3.2-2006). Defines the managerial and administrative controls for operating commercial power plants. Nuclear Quality Assurance (NQA)-1 will be referenced to provide for quality assurance requirements that are common to all phases (construction, design, and operations).

#### New

- o ANS 8.28-201x, *Administrative Practices for the Use of Non-Destructive Assay Measurements for Nuclear Criticality Safety* (new standard). Provides administrative practices covering the interface between the criticality safety community and the non-destructive assay community including in-situ measurements and measurements of containerized materials.
- o ANS 58.16-201x, *Safety Classification and Design Criteria for Non-Reactor Nuclear Facilities* (new standard). Provides guidance and criteria for the safety classification of safety functions and associated hazard controls (such as, structures, systems, components and administrative controls) associated with nuclear safety in non-reactor nuclear facilities. This standard provides guidance on how to derive safety functions and the design and operational requirements to satisfy these functions. It also associates the safety classification of hazard controls to engineering (e.g., civil/structural, mechanical, electrical) and programmatic (e.g., quality assurance) classification levels.

### Health Physics Society (HPS)

#### Revisions

- o N13.12-201x, *Surface and Volume Radioactivity Standards for Clearance* (revision of ANSI N13.12-1999 (R2010)). Establishes a primary radiation dose criterion and derived screening levels for clearance, which are harmonized with International Atomic Energy Agency recommendations.

#### New

- o N13.1-2011, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities* (new standard). Sets forth guidelines and performance-based criteria for the design and use of systems for sampling the releases

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## NEW AND REVISED STANDARDS

of airborne radioactive substances from the ducts and stacks of nuclear facilities.

- o N13.14-201x, *Bioassay Programs for Tritium* (new standard). Describes how to design and implement a bioassay program for tritium. This standard includes:
  - Establishing the need for a tritium radiobioassay program;
  - Development of the tritium bioassay program;
  - Collection and measurement of tritium radiobioassay samples;
  - Interpretation of tritium radiobioassay measurements; records.

This standard also includes implementation of ANSI N13.39, *Design of Internal Dosimetry Programs*, and recommendations for the specific application to tritium bioassay programs.

- o N13.45-201x, *Incineration of Low-Level Radioactive Waste* (new standard). Provides guidelines for incineration of combustible forms of low-level radioactive waste. This standard addresses the siting, licensing and permitting, operation and monitoring of the incinerator operation, disposal of residues, and decommissioning. This standard may be applied to incineration of mixed wastes, i.e., radioactive wastes that contain other hazardous components as defined by federal or state agencies, provided consideration is given to additional design features and regulatory permitting required by the hazardous nature of the wastes.

### Reaffirmations

- o N13.39-2001 (R201x), *Design of Internal Dosimetry Programs* (reaffirmation of ANSI N13.39-2001). Contains the essential elements of the internal dosimetry component of a radiation protection program. This standard provides general policies and the framework for the design and implementation of an acceptable internal dosimetry program.
- o N13.49-2001 (R201x), *Performance and Documentation of Radiological Surveys* (reaffirmation of ANSI N13.49-2001). Provides minimum requirements for the performance and documentation of radiological surveys. These requirements are incorporated into procedures

for specific survey programs, thereby assuring that survey information is complete, uniform, and sufficient for its intended purposes.

### National Fire Protection Association (NFPA)

#### Revisions

- o NFPA 801-201x, *Standard for Fire Protection for Facilities Handling Radioactive Materials* (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.

### New and Revised Standards

#### American Nuclear Society (ANS)

##### New

- o ANSI/ANS 2.17-2010, *Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants* (new standard): 12/23/2010. Establishes the requirements for evaluating the occurrence and movement of radionuclides in the subsurface resulting from abnormal radionuclide releases at commercial nuclear power plants. This standard applies to abnormal radionuclide releases that affect groundwater, water supplies derived from groundwater, and surface waters affected by subsurface transport, including exposure pathways across the groundwater-surface-water transition zone.

##### Revisions

- o ANSI/ANS 19.6.1-2011, *Reload Startup Physics Tests for Pressurized Water Reactors* (revision of ANSI/ANS 19.6.1-2005): 1/13/2011. This standard applies to the reactor physics tests that are performed following a refueling or other core alteration of a Pressurized Water Reactor (PWR) for which nuclear design calculations are required. This standard does not address the physics test program for the initial core of a commercial PWR.

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**NEW AND REVISED STANDARDS****American Society of Mechanical Engineers (ASME)**

- o ANSI/ASME AG-1b-2011, *Code on Nuclear Air and Gas Treatment* (addenda to ANSI/ASME AG-1-2009): 4/11/2011. This code provides minimum requirements for the performance, design, construction, acceptance testing, and quality assurance of equipment used as components in nuclear safety-related air and gas treatment systems in nuclear facilities.
- o ANSI/ASME NQA-1b-2010, *Quality Assurance Requirements for Nuclear Facility Applications* (addenda to ANSI/ASME NQA-1-2008): 2/4/2011. Reflects industry experience and current understanding of the quality assurance requirements necessary to achieve safe, reliable, and efficient utilization of nuclear energy, and management and processing of radioactive materials. The Standard focuses on the achievement of results, emphasizes the role of the individual and line management in the achievement of quality, and fosters the application of these requirements in a manner consistent with the relative importance of the item or activity. This Part sets forth requirements for the

establishment and execution of quality assurance programs during siting, design, construction, operation, and decommissioning of nuclear facilities.

**ASTM (ASTM International)****Revisions**

- o ANSI/ASTM C1144 - 89(2011) *Standard Test Method for Splitting Tensile Strength for Brittle Nuclear Waste Forms* (Revision to ANSI/ASTM C1144-89(1997); R2004): 2/1/2011. Test method used to measure the static splitting tensile strength of cylindrical specimens of brittle nuclear waste forms. Provides data that can be used to compare strength of waste forms when tests are done on one size of specimen.

**Reaffirmations**

- o ANSI/ASTM E2381- 04(2010), *Guide for Dosimetry in Radiation Processing of Fluidized Beds and Fluid Streams* (reaffirmation of ANSI/ASTM E2381-2004): 12/12/2010. Describes several dosimetry systems and methods suitable for the documentation of the irradiation of product transported as fluid or in a fluidized bed.

*(Continued on page 8)***Standards Development Organizations****Points of Contact Information****Patricia Schroeder**

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## PROGRAM INFORMATION

## Institute of Electrical and Electronics Engineers (IEEE)

## New

- o N42.49A-2010, *Performance Criteria for Alarming Electronic Personal Emergency Radiation Detectors (PERDs) for Exposure Control* (new standard): 1/4/2011. Establishes minimum performance criteria and test requirements for four categories of alarming electronic radiation detectors used to manage exposure by alerting the emergency responders when they are exposed to photon radiation. The instruments provide rapid and clear indication of the level of radiation exposure and/or exposure rate and readily recognizable alarms. The alarms are both audible and visual, and distinguishable between exposure rate and exposure.

International Organization for Standardization (ISO) Technical Committee (TC) 85: *Nuclear Energy, Nuclear Technologies, & Radiological Protection*

## New

- o ISO 27048:2011, *Radiation Protection - Dose Assessment for the Monitoring of Workers for Internal Radiation Exposure* (new standard): 01/07/2011. Specifies the minimum requirements for the evaluation of data from the monitoring of workers occupationally exposed to the risk of internal contamination by radioactive substances. Presents procedures and assumptions for the standardized interpretation of monitoring data in order to achieve acceptable levels of reliability.

## 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**

In support of the Department's Standards Program and in partnership with all stakeholders, the mission is 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/](http://www.hss.energy.gov/nuclearsafety/ns/techstds/)

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