American Nuclear Society

Standards Committee Report of Activities

2013

American Nuclear Society

STANDARDS COMMITTEE

Report of Activities

2013

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INTRODUCTION

The Report of Activities of the American Nuclear Society (ANS) Standards Committee represents a record of the Committee's achievements for the calendar year 2013. The Report provides information on ANS standards projects.

Nearly 1000 volunteer members participate in the development of ANS-sponsored nuclear standards, of which there are over 120 in various phases of maintenance and development. As of the end of 2013, there were 76 current standards approved by the American National Standards Institute as American National Standards.

The ANS Standards Committee develops standards in accordance with the accredited organization method for developing evidence of consensus for their approval as American National Standards.

The work of the Standards Committee is managed by eight consensus committees:

NCS: Nuclear Criticality Safety

ES: Environmental and Siting

FWD: Fuel, Waste and Decommissioning

LLWR: Large Light Water Reactor

NRNF: Nonreactor Nuclear Facilities

RAR: Research and Advanced Reactors

SRA: Safety and Radiological Analsyis

JCNRM: Joint Committee on Nuclear Risk Management

This report is presented in eight individual sections, each of which sets forth the details on those subcommittees and working groups active under its respective consensus committee.

ANS Standards Development Process

The mission of the American Nuclear Society (ANS) Standards Committee is to develop voluntary consensus standards to be certified by the American National Standards Institute (ANSI) as American National Standards. The ANSI has served as administrator and coordinator of the United States private sector voluntary standardization system for close to 100 years. Founded in 1918 by five engineering societies and three government agencies, the Institute remains a private, nonprofit membership organization supported by a diverse constituency of private and public sector organizations. Its prescribed process is set forth in the ANS Standards Committee Rules and Procedures, and it is also illustrated in the following flow chart presented as Figure 1.

The National Technology Transfer and Advancement Act of 1995 (NTTAA) requires all federal agencies and departments to use technical standards that are developed or adopted by voluntary consensus standards bodies, unless such use is impractical or inconsistent with law. To implement the Act, the Office of Management and Budget issued Circular A-119, which provides guidance to promote consistent application of the Act across federal agencies and departments. The NTTAA is available at http://standards.gov/standards_gov/nttaa.cfm. OMB Circular A-119 can be found at http://www.whitehouse.gov/omb/circulars/a119/a119.html.

The process to produce an American National Standard requires time, patience, most of all dedication of many professionals. The birth of a standard begins with recognizing a need for a particular standard. Any individual or committee within the ANS Standards Committee may identify this need by completing a Project Initiation Notification System (PINS) form, which declares the purpose and need of the proposed standard. The document is reviewed, discussed, and most often approved by a select subcommittee (SC) and a consensus committee (CC) that will oversee the standard. Last, the Standards Board (SB) will review the PINS form before it is submitted to ANSI.

Once the PINS form is approved and submitted to ANSI, a working group (WG) is assembled to commence the standards development process. Working group members comprise a small number of individuals recognized for their expertise in the subject. Although there is no requirement for a balance of representation on a WG, as required for the CC, WG membership should include those organizations having a significant interest in the project.

Subcommittees (SC) consist of members who have been appointed due to their expertise in one or more areas. They manage the development of several standards in closely related disciplines. Each SC member is expected to lend his/her special expertise in the development of standards. Subsequent to drafting the standard, a formal ballot process within the SC is not required, but SC approval is often achieved via internal committee discussion.

The SB has established eight consensus committees -- Nuclear Criticality Safety (NCS), Environmental & Siting (ES), Fuel, Waste & Decommissioning (FWD), Large Light Water Reactors (LLWR), Nonreactor Nuclear Facilities (NRNF), Research & Advanced Reactors (RAR), Safety & Radiological Analysis (SRA), and Joint Committee on Nuclear Risk Management (JCNRM). Consensus committees (CC) comprise a diverse balance of interest. Each CC supervises the development of proposed standards within their assigned scopes, and they achieve consensus approval of these projects. A formal ballot must be employed to ascertain each member's position on the standards brought before the committee.

The WG chair must respond to all "approved with comments" and "negative" comments received from the formal ballot period; the SC may assist in resolving comments. Balloters who ballot negative, must review the attempted resolution of his/her negative ballot vote. If the negative balloter finds the response unacceptable, then the balloter may maintain that decision by formally stating his/her

reasons for doing so. Any outstanding negative positions must be circulated to all members of the CC for review. A member holding an affirmative position may change his/her vote if he/she wishes to support negative balloters.

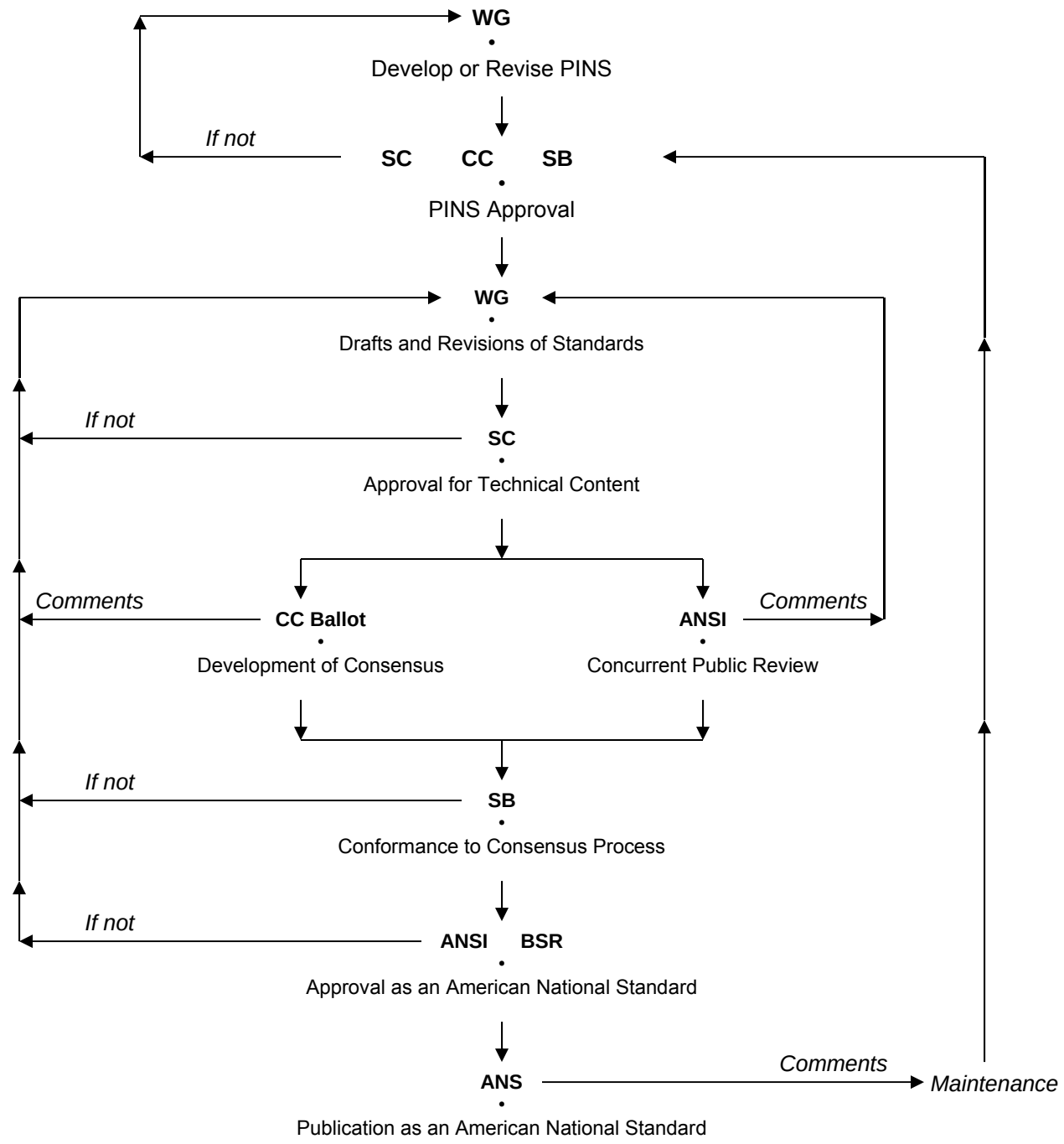
Simultaneous to the CC ballot, public review (PR) is conducted through the auspices of ANSI. ANSI announces a 45 or 60-day public review period for the proposed standard in its publication, *Standards Action*. As with CC comments, all comments from PR must be considered and resolved promptly.

Upon completion of the consensus process, a Letter Ballot is created for the SB to review and certify that all ANS procedures have been implemented to finalize the standard. The SB Letter Ballot summarizes the CC ballot tallies and other details during the ballot period.

The final step in the development of a proposed standard is to gain approval by the ANSI Board of Standards Review (BSR). Once certification by the SB has been granted, documentation is sent to the ANSI BSR with details of the ballot results to carefully scrutinize the case.

After ANSI notifies ANS of its approval, the proposed standard emerges as an American National Standard—a remarkable achievement and a credit to all the volunteers who made it possible.

Once approved, an American National Standard must be maintained to keep its certification. ANSI dictates that current standards be reviewed at least every five years to determine if the standard should be reaffirmed (reapproved), revised, or withdrawn. Standards that are found to be current and are not in needed of any changes can be reaffirmed. A reaffirmation requires a consensus ballot, public review, and recertification by ANSI. Absolutely no changes can be made to the formal portion of a standard through the reaffirmation process. If any changes are deemed necessary, a revision should be initiated. If the evaluation of technical content reveals that strict application of one or more criteria could result in equipment inoperability or a violation of a safety or technical specification, withdrawal shall be recommended.



WG - Working Group
SC - Subcommittee
CC - Consensus Committee
SB - Standards Board
ANSI - American National Standards Institute
BSR - Board of Standards Review
ANS - American Nuclear Society

Figure 1 - Steps in the Development of a Standard

Standards Board Report
Donald J. Spellman, CHAIR

The greatest effort of 2013 has been the reorganization of the ANS Standards Committee. The proposal was first brought forward at the June 2012 Standards Board meeting resulting in the formation of a special committee to assess the need and benefit of a reorganization. The evaluation found an advantage to reorganizing the four existing consensus committees (CCs), that being an increase in efficiency and productivity and a broader range of expertise of CC members due to the focused topical area concentration. Standards products of these previous CCs have been reorganized into six topical areas. Members of these prior committees have been reassigned and new members have been recruited. Balance of Interest Reports have been prepared for certification by the Standards Board allowing these new committees to be fully functional. All six of the new consensus committees are scheduled to hold kick off meetings during the ANS 2013 Winter Meeting.

The Risk-informed and Performance-based Principles Policy Committee (RP3C) held an inaugural meeting during the 2013 ANS Annual Meeting in Atlanta, Georgia, and held a second meeting during the 2013 ANS Winter meeting in Washington, D.C. The RP3C is responsible for the identification and oversight of the approaches, priorities, responsibilities and schedules for implementation of risk-informed and performance-based principles in ANS standards. The RP3C is also responsible for reviewing standards being developed by other standards developing organizations as appropriate to ensure consistency. The RP3C reports directly to the ANS Standards Board.

The ANS Standards Committee recently issued responses to two separate inquiries on ANSI/ANS-18.1-1999 (W2009), "Radioactive Source Term for Normal Operation for Light Water Reactors." The responses were published in the August 2013 issue of Nuclear News and are available on the ANS Website.

After a very long negotiation with the Nuclear Regulatory Commission (NRC), ANSI/ANS-3.2-2012, "Managerial, Administrative, and Quality Assurance Controls for Operational Phase of Nuclear Power Plants," was endorsed by the NRC in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 3, in June 2013. The primary issue has long been the separation of design and construction QA as documented in ANSI/ASME NQA-1 and the operational phase QA as documented in ANS-3.2.

The U.S. Department of Energy issued DOE-STD-1020-2012, "National Phenomena Hazards Analysis and Design Criteria for ODE Facilities," in December of 2012. This standard adopts the following four ANS standards:

- ANSI/ANS-2.3-2011, “Estimating Tornado, Hurricane, and Extreme Straight-Line Wind Characteristics at Nuclear Facilities”
- ANSI/ANS-2.26-2004 (R2010), “Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design”
- ANSI/ANS-2.27-2008, “Criteria for Investigation of Nuclear Facility Sites for Seismic Hazard Assessments”
- ANSI/ANS-2.29-2008, “Probabilistic Seismic Hazard Analysis”

ANSI/ANS-2.21-2012, “Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink,” was reviewed by the NRC, and guidance from this standard was incorporated in the draft regulatory guide 1275, proposed revision 3 of Regulatory Guide 1.27, “Ultimate Heat Sink for Nuclear Power Plants.” It is expected that ANSI/ANS-2.21-2012 will be endorsed in revision 3 of RG 1.27 when issued.

Carl A. Mazzola was selected for the 2013 Standards Service Award in recognition of his rejuvenation and development of ANS siting and environmental standards and strong leadership of the Nuclear

Facilities Standards Committee. Mazzola was presented the award at the Plenary Session on Monday, November 11, 2013, at the ANS Winter Meeting in Washington D.C.

All current and historic standards sold in the ANS Online Store were digitized providing users the option of purchasing standards in print or electronic format. Abstracts called "Sneak Peeks" were also added to the online store and are available for viewing as an enticement to purchase.

Panelists at an NRC Workshop on Probabilistic Flood Hazard Assessment (PFHA) in January of this year included ANS Standards Committee members to address questions on the development of ANS standards currently in development in the area of PFHA—ANS-2.8, "Determining External Flood Hazards for Nuclear Facilities," and ANS-2.31, "Determining Design Basis On-Site Flooding Caused by Precipitation at Nuclear Facility Sites."

Several ANS standards were applied in a University of Pittsburg graduate course titled "Case Studies in Nuclear Codes and Standards" as part of the school's Nuclear Engineering Program. The course addresses 17 major standards. Standards from the American Society of Mechanical (ASME), ASTM International, and the Institute of Electrical and Electronics Engineers were also part of the curriculum.

Addenda B of joint standard ANSI/ASME/ANS RA-S-2008, “Standard for Level 1 / Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications,” has just been released. This standard was developed by a collaboration of the ASME and the ANS. This joint standard combines ASME RA-S whose scope was Level 1 and large early release frequency for internal events at-power for light water reactor nuclear power plants and two ANS standards, whose scopes were external hazards (ANS-58.21) and internal fires (ANS-58.23) at-power for LWR nuclear power plants. Additionally joint standard ASME/ANS RA-S-1.4-2013, “Probabilistic Risk Assessment Standard for Advanced Non-LWR Nuclear Power Plants” was released just before the end of 2013 for a 36-month trial use and pilot application.

The ANS Standards Committee received American National Standards Institute (ANSI) approval of the following five American National Standards and three reaffirmations:

- ANSI/ANS-2.15-2013, "Criteria for Modeling and Calculating Atmospheric Dispersion of Routine Radiological Releases from Nuclear Facilities" (new standard)
- ANSI/ANS-3.4-2013, "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants" (superseded ANSI/ANS-3.4-1996)
- ANSI/ANS-5.10-1998 (R2013), "Airborne Release Fractions at Nonreactor Nuclear Facilities" (reaffirmation of ANSI/ANS-5.10-1998 (R2006))
- ANSI/ANS-6.1.2-2013, “Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants” (revision of ANSI/ANS-6.1.2-1999 (R2009))
- ANSI/ANS-10.7-2013, Non-Real-Time, High-Integrity Software for the Nuclear Industry—Developer Requirements" (new standard)
- ANSI/ANS-15.1-2007 (R2013), "The Development of Technical Specifications for Research Reactors" (reaffirmation of ANSI/ANS-15.1-2007)
- ANSI/ANS-15.8-1995 (R2013), "Quality Assurance Program Requirements for Research Reactors" (reaffirmation of ANSI/ANS-15.1-1995)
- ANSI/ANS-15.21-2012, "Format and Content for Safety Analysis Reports for Research Reactors" (revision of ANSI/ANS-15.21-1996)

Project Initiation Notification Systems (PINS) forms were approved and submitted to ANSI to announce the initiation of the following 8 standards projects:

- ANS-3.11-201x, “Determining Meteorological Data for Nuclear Facilities” (revision of ANSI/ANS-3.11-2005; R2010)

- ANS-10.8-201x, “Non-Real Time, High-Integrity Software for the Nuclear Industry—User Requirements” (new standard)
- ANS-15.4-201x, “Selection and Training of Personnel for Research Reactors” (revision of ANSI/ANS-15.4-2007)
- ANS-19.5-201x, “Requirements for Reference Reactor Physics Measurements” (revision of withdrawn standard ANSI/ANS-19.5-1995)
- ANS-20.1-201x, “Nuclear Safety Criteria and Design Criteria for Fluoride Salt-Cooled High-Temperature Reactor Nuclear Power Plants” (new standard)
- ANS-57.2-201x, “Design Requirements for Light Water Reactor Used Fuel Storage Facilities at Nuclear Power Plants” (revision of withdrawn standard ANSI/ANS-57.2-1983)
- ANS-57.3-201x, “Design Requirements for New Fuel Storage Facilities at Light Water Reactor Plants” (revision of withdrawn standard ANSI/ANS-57.3-1983)
- ANS-57.11-201x, “Integrated Safety Assessments for Fuel Cycle Facilities” (new standard)

ANS Standards Committee

Scope:

The American Nuclear Society Standards Committee is responsible for the development and maintenance of standards that address the design, analysis, and operation of components, systems, and facilities related to the application of nuclear science and technology. The scope of the Standards Committee includes the development and maintenance of standards on the following subjects and closely related activities:

a. *Definitions of terminology used in nuclear science and technology*
b. *Siting requirements for nuclear facilities*
c. *Nuclear facility design and operations, including safety criteria for facilities, operator selection, and training*
    i. *Power production reactors*
    ii. *Research reactors and critical facilities*
    iii. *Nuclear fuel production, handling, and storage facilities*
d. *Facilities for handling radioactive isotopes, including remote handling of radioactive materials*
e. *Remediation and restoration of sites used for nuclear facilities*
f. *Emergency Preparedness*
g. *Nuclear criticality safety*
h. *Reactor physics and radiation shielding*
i. *Computational analysis programs used in the nuclear field*
j. *Probabilistic risk assessment, risk management, and risk criteria*
k. *Fission product behavior*
l. *Radioactive waste management*

The Standards Committee does not develop standards for the application of radiation for medical purposes.

The Standards Committee reviews standards being developed or issued by other organizations on related topics to help ensure consistency and completeness and to avoid duplication.

Standards developed by the Standards Committee are intended to be issued as American National Standards.

The Standards Committee consists of consensus committees, subcommittees, and working groups, all of which are under the administrative control and policy direction of the ANS Standards Board (SB).

Standards Board Membership

Donald J. Spellman, Chair, Oak Ridge National Laboratory

Steven L. Stamm, **Vice Chair**, Member at Large, Individual

James K. August, Member at Large, CORE, Inc.

Robert J. Budnitz, Ex Officio Member (JCNRM), WENRA Liaison, Lawrence Berkeley National Lab.

Robert D. Busch, Ex Officio Member (NCS), University of New Mexico

George F. Flanagan, Ex Officio Member (RAR)

Donald R. Eggett, Ex Officio Member (FWD)

Herbert W. Massie, Jr., Member at Large, Defense Nuclear Facilities Safety Board

Carl A. Mazzola, Ex Officio Member (ES), CB&I Special Services

Charles H. Moseley, Jr., Member at Large, Individual

James O'Brien, Ex Officio Member (NRNF)

Mathew M. Panicker, Member at Large, U.S. Nuclear Regulatory Commission

William B. Reuland, Ex Officio Member (LLWR)

R. Michael Ruby, Member at Large, Individual

R. David Sachs, Member at Large, Individual

Andrew O. Smetana, Ex Officio Member (SRA), Savannah River National Laboratory

William M. Turkowski, Member at Large, Westinghouse Electric Company

Edward G. Wallace, Member at Large, NuScale Power Inc.

Calvin M. Hopper, Observer, Individual

Jeffery R. Brault, AGS Liaison, Individual

N. Prasad Kadambi, ANSI/ISO TC 85/SC 6, NESCC, NRMCC Liaison, Individual

Stanley H. Levinson, JCNRM/SCoRA Liaison, AREVA Inc.

James H. Riley, NEI Liaison, Nuclear Energy Institute

Tina Taylor, EPRI Liaison, Electric Power Research Institute

Ex Officio Member = Consensus Committee Chair

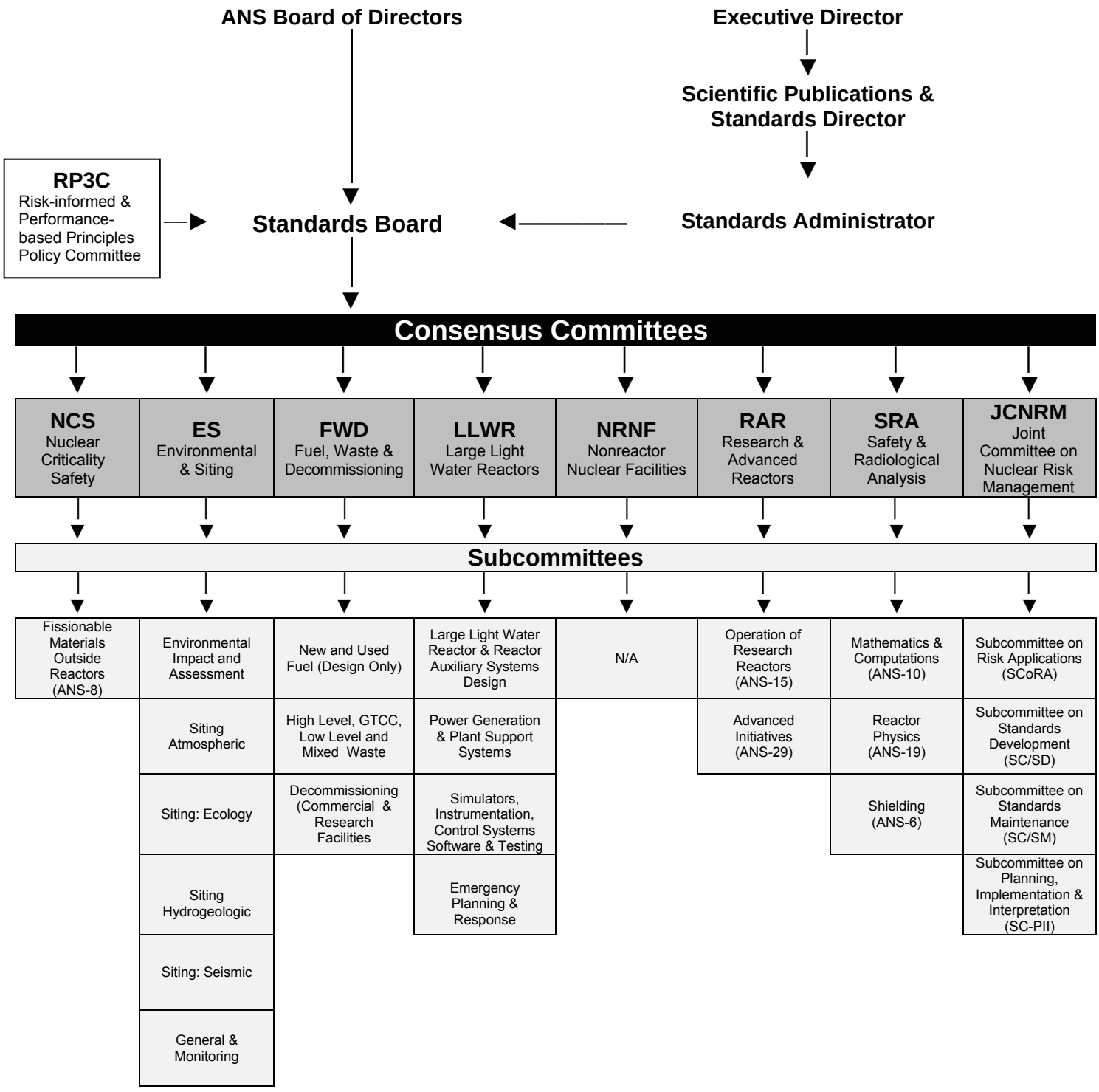


Figure 2 – ANS Standards Committee: Organizational Chart

SUBCOMMITTEE CHAIRS

Advanced Initiatives/ANS-29 (RAR)	Bruce Bevard
Fissionable Material Outside Reactors/ANS-8 (NCS)	Lon Paulson
Decommissioning (Commercial and Research Facilities) (FWD)	OPEN
Emergency Planning & Response (LLWR)	Evan Lloyd
Environmental and Impact Assessment (ES)	Kevin Bryson
High Level, GTCC, Low Level, and Mixed Waste (FWD)	OPEN
Large Light Water Reactor & Reactor Auxiliary Systems Design (LLWR)	Dennis Newton
Mathematics & Computations/ANS-10 (SRA)	OPEN
New and Used Fuel (Design Only) (FWD)	OPEN
Operation of Research Reactors/ANS-15 (RAR)	Sean O'Kelly
Power Generation & Plant Support Systems (LLWR)	Rocky Krieder
Reactor Physics/ANS-19 (SRA)	Dimitrios Cokinos
Shielding/ANS-6 (SRA)	Charlotta Sanders
Siting: Atmospheric (ES)	John Stevenson
Siting: Ecology (ES)	John Downing
Siting: General & Monitoring (ES)	Lisa Brandon
Siting: Hydrogeologic (ES)	Yan Gao
Siting: Seismic (ES)	Quazi Hossain
Simulators, Instrumentation, Control Systems, Software & Testing (LLWR)	Ronald Bruno
Subcommittee on Planning, Implementation & Interpretation (JCNRM)	Gene Hughes
Subcommittee on Risk Applications (JCNRM)	Kenneth Kiper
Subcommittee on Standards Development (JCNRM)	Barry Sloane
Subcommittee on Standards Maintenance (JCNRM)	Paul Amico

APPROVED
AMERICAN NATIONAL STANDARDS
Developed by the ANS Standards Committee
(through December 2013)

ANS-1-2000; R2007; R2012	Conduct of Critical Experiments (reaffirmed 10/5/2012)
ANS-2.3-2011	Estimating Tornado, Hurricane, and Extreme Straight Line Wind Characteristics at Nuclear Facility Sites (approved 4/22/2011)
ANS-2.15-2013	Criteria for Modeling and Calculating Atmospheric Dispersion of Routine Radiological Releases from Nuclear Facilities (approved 2/27/2013)
ANS-2.17-2010	Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants (approved 12/23/10)
ANS-2.21-2012	Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink (approved 6/5/2012)
ANS-2.23-2002; R2009	Nuclear Plant Response to an Earthquake (reaffirmed 6/15/2009)
ANS-2.26-2004; R2010	Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design (reaffirmed 5/27/2010)
ANS-2.27-2008	Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments (approved 7/31/2008)
ANS-2.29-2008	Probabilistic Seismic Hazard Analysis (approved 7/31/2008)
ANS-3.2-2012	Managerial, Administrative, and Quality Assurance Controls for the Operational Phase of Nuclear Power Plants (approved 3/20/2012)
ANS-3.4-2013	Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants (approved 4/29/2013)
ANS-3.5-2009	Nuclear Power Plant Simulators for Use in Operator Training and Examination (approved 9/4/2009)
ANS-3.11-2005; R2010	Determining Meteorological Information at Nuclear Facilities (reaffirmed 12/23/2010)
ANS-5.1-2005	Decay Heat Power in Light Water Reactors (approved 4/1/2005)
ANS-5.4-2011	Method for Calculating the Fractional Release of Volatile Fission Products from Oxide Fuel (approved 5/19/2011)
ANS-5.10-1998; R2006; R2013	Airborne Release Fractions at Non-Reactor Nuclear Facilities (reaffirmed 1/15/2013)

ANS-6.1.2-2013	Group-Averaged Neutron and Gamma-Ray Cross Sections for Radiation Protection and Shielding Calculations for Nuclear Power Plants (approved 8/28/2013)
ANS-6.1.2-1999; R2009	Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants (reaffirmed 2/23/2009)
ANS-6.3.1-1987; R1998; R2007	Program for Testing Radiation Shields in Light Water ReactorsR2007 (LWR) (reaffirmed 4/20/2007)
ANS-6.4-2006	Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants (approved 9/29/2006)
ANS-6.4.2-2006	Specification for Radiation Shielding Materials (approved 9/28/2006)
ANS-6.6.1-1987; R1998; R2007	Calculation and Measurement of Direct and Scattered Gamma Radiation from LWR Nuclear Power Plants (reaffirmed 3/5/2007)
ANS-8.1-1998; R2007	Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors (reaffirmed 5/16/2007)
ANS-8.3-1997; R2003 R2012	Criticality Accident Alarm System (reaffirmed 7/26/2012)
ANS-8.5-1996; R2002; R2007; R2012	Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material (reaffirmed 2/23/2012)
ANS-8.6-1983; R1988; R1995; R2001; R2010	Safety in Conducting Subcritical Neutron-Multiplication Measurements In Situ (reaffirmed 11/16/2010)
ANS-8.7-1998; R2007 R2012	Nuclear Criticality Safety in the Storage of Fissile Materials (reaffirmed 2/23/2012)
ANS-8.10-1983; R1988; R1999; R2005	Criteria for Nuclear Criticality Safety Controls in Operations With Shielding and Confinement (reaffirmed 4/1/2005)
ANS-8.12-1987; R1993 R2002; R2011	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors (reaffirmed 2/11/2011)
ANS-8.14-2004; R2011	Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors (reaffirmed 11/16/2011)
ANS-8.15-1981; R1987; R1995; R2005	Nuclear Criticality Control of Special Actinide Elements (reaffirmed 7/15/2005)
ANS-8.17-2004; R2009	Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors (reaffirmed 9/14/2009)
ANS-8.19-2005	Administrative Practices for Nuclear Criticality Safety (approved 5/16/2005)

ANS-8.20-1991; R1999; R2005	Nuclear Criticality Safety Training (reaffirmed 9/16/2005)
ANS-8.21-1995; R2001 R2011	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors (reaffirmed 5/19/2011)
ANS-8.22-1997; R2006 R2011	Nuclear Criticality Safety Based on Limiting and Controlling Moderators (reaffirmed 11/11/2011)
ANS-8.23-2007; R2012	Nuclear Criticality Accident Emergency Planning and Response (reaffirmed 5/31/2012)
ANS-8.24-2007; R2012	Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations (reaffirmed 5/31/2012)
ANS-8.26-2007; R2012	Criticality Safety Engineer Training and Qualification Program (reaffirmed 5/31/2012)
ANS-8.27-2008	Burnup Credit for Light Water Reactor Fuel (approved 8/14/2008)
ANS-10.2-2000; R2009	Portability of Scientific and Engineering Software (reaffirmed 8/14/2009)
ANS-10.4-2008	Verification and Validation of Non-Safety Related Scientific and Engineering Computer Programs for the Nuclear Industry (approved 10/28/2008)
ANS-10.5-2006; R2011	Accommodating User Needs in Scientific and Engineering Computer Software Development (reaffirmed 11/17/2011)
ANS-10.7-2013	Non-Real Time, High-Integrity Software for the Nuclear Industry: Developer Requirements (approved 3/18/2013)
ANS-14.1-2004; R2009	Operation of Fast Pulse Reactors (reaffirmed 10/27/2009)
ANS-15.1-2007; R2007; R2013	The Development of Technical Specifications for Research Reactors (reaffirmed 4/24/2013)
ANS-15.2-1999; R2009	Quality Control for Plate-Type Uranium-Aluminum Fuel Elements (reaffirmed 3/23/2009)
ANS-15.4-2007	Selection and Training of Personnel for Research Reactors (approved 8/17/2007)
ANS-15.8-1995; R2005; R2013	Quality Assurance Program Requirements for Research Reactors (reaffirmed 5/10/2013)
ANS-15.11-2009	Radiation Protection at Research Reactor Facilities (approved 10/8/2009)
ANS-15.16-2008	Emergency Planning for Research Reactors (approved 9/23/2008)

ANS-15.21-1996; R2006	Format and Content for Safety Analysis Reports for Research Reactors (reaffirmed 9/29/2006)
ANS-16.1-2003; R2008	Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-Term Test Procedure (reaffirmed 8/4/2008)
ANS-19.1-2002; R2011	Nuclear Data Sets for Reactor Design Calculations (reaffirmed 6/17/2011)
ANS-19.3-2011	Steady-State Neutronics Methods for Power Reactor Analysis (approved 8/26/2011)
ANS-19.3.4-2002; R2008	The Determination of Thermal Energy Deposition Rates in Nuclear Reactors (reaffirmed 10/31/2008)
ANS-19.6.1-2011	Reload Startup Physics Tests for Pressurized Water Reactors (approved 1/13/2011)
ANS-19.10-2009	Methods for Determining Neutron Fluence in BWR and PWR Pressure Vessel and Reactor Internals (approved 2/24/2009)
ANS-19.11-1997; R2002 R2011	Calculations and Measurement of the Moderator Temperature Coefficient of Reactivity for Water Moderated Power Reactors (reaffirmed 6/17/2011)
ANS-40.37-2009	Mobile Low Level Radioactive Waste Processing Systems (approved 11/20/2009)
ANS-41.5-2012	Verification and Validation of Radiological Data for Use in Waste Management and Environmental Remediation (approved 2/15/2012)
ANS-51.10-2002; R2008	Auxiliary Feedwater System for Pressurized Water Reactors (reaffirmed 10/14/2008)
ANS-53.1-2011	Nuclear Safety Design Process for Modular-Helium Cooled Reactor Plants (approved 12/21/2011)
ANS-55.1-1992; R2000; R2009	Solid Radioactive Waste Processing Systems for Light Water Cooled Reactor Plants (reaffirmed 6/15/2009)
ANS-55.4-1993; R1999 R2007	Gaseous Radioactive Waste Processing Systems for Light Water Reactor Plants (reaffirmed 5/14/2007)
ANS-55.6-1993; R1999; R2007	Liquid Radioactive Waste Processing System for Light Water Reactor Plants (reaffirmed 5/14/2007)
ANS-56.8-2002; R2011	Containment System Leakage Testing Requirements (reaffirmed 8/9/2011)
ANS-57.1-1992; R1998;	Design Requirements for Light Water Reactor Fuel Handling

R2005	Systems (reaffirmed 7/20/2005)
ANS-57.5-1996; R2006	Light Water Reactors Fuel Assembly Mechanical Design and Evaluation (reaffirmed 2/28/2006)
ANS-57.8-1995; R2005; R2011	Fuel Assembly Identification (reaffirmed 8/26/2011)
ANS-57.10-1996; R2006	Design Criteria for Consolidation of LWR Spent Fuel (reaffirmed 7/6/2006)
ANS-58.3-1992; R1998; R2008	Physical Protection for Nuclear Safety-Related Systems and Components (reaffirmed 3/18/2008)
ANS-58.8-1994; R2001; R2008	Time Response Design Criteria for Safety-Related Operator Actions (reaffirmed 8/25/2008)
ANS-58.9-2002; R2009	Single Failure Criteria for Light Water Reactor Safety-Related Fluid Systems (reaffirmed 2/24/2009)
ANS-58.14-2011	Safety and Pressure Integrity Classification Criteria for Light Water Reactors (approved 4/22/2011)
ANS-59.51-1997; R2007	Fuel Oil Systems for Safety-Related Emergency Diesel Generators (reaffirmed 10/4/2007)
ANS-59.52-1998; R2007	Lubricating Oil Systems for Safety-Related Emergency Diesel Generators (reaffirmed 10/4/2007)
ASME/ANS RA-S-2008	Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications (approved 4/9/2008; Addenda A approved 2/2/2009; Addenda B approved 7/1/2013)
ASME/ANS RA-1.4-2013	Probabilistic Risk Assessment Standard for Advanced Non-LWR Nuclear Power Plants (approved for trial use by the JCNRM; not approved by ANSI)

Nuclear Criticality Safety (NCS) Consensus Committee

Robert D. Busch, Chair
University of New Mexico

Scope:

To develop standards for determining the potential for nuclear criticality of fissile fissionable material outside reactors, for the prevention of accidental criticality, and for coping with accidents should they occur.

NCS Membership:

Robert D. Busch, Chair, University of New Mexico
Larry L. Wetzel, Vice Chair, Babcock & Wilcox Nuclear Operations Group
Lawrence J. Berg, U.S. Department of Energy
George H. Bidinger, Individual
William Doane, AREVA Inc.
Robert S. Eby, AIChE Representative (employed by USEC)
Calvin M. Hopper, Individual
Ronald A. Knief, INMM Representative (employed SNL)
Thomas Marenchin, U.S. Nuclear Regulatory Commission
Scott P. Murray, HPS Representative (employed by General Electric Co.)
Lon E. Paulson, GE Hitachi Nuclear Energy (ANS-8 Chair)
Ronald E. Pevey, University of Tennessee
Raymond L. Reed, URS Safety Management Solutions, LLC
Richard G. Taylor, INM Nuclear Safety Services
R. Michael Westfall, Oak Ridge National Laboratory
Robert E. Wilson, U.S. Department of Energy

Report of NCS:

The NCS met at the ANS Winter Meeting on November 11, 2013. Progress on revisions and new standards are provided in subsequent reports.

Approved in 2013

Although NCS has many standards in development and in the approval process, no standards were reaffirmed or approved by ANSI in 2013.

Active Standards/Projects:

ANS-8.1, "Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors" (revision of ANSI/ANS-8.1-1998; R2007)

ANS-8.3, "Criticality Accident Alarm System" (revision of ANSI/ANS-8.3-1997; R2003; R2012)

ANS-8.7, "Nuclear Criticality Safety in the Storage of Fissile Materials" (revision of ANSI/ANS-8.7-1998; R2007; R2012)

ANS-8.10, "Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement" (revision of ANSI/ANS-8.10-1983; R1988; R1999; R2005)

ANS-8.12, "Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors" (revision of ANSI/ANS-8.12-1987; R1993; R2002)

ANS-8.15, "Nuclear Criticality Control of Special Actinide Elements" (revision of ANSI/ANS-8.15-1981; R1987; R1995; R2005)

ANS-8.19, "Administrative Practices for Nuclear Criticality Safety" (revision of ANSI/ANS-8.19-2005)

ANS-8.20, "Nuclear Criticality Safety Training" (revision of ANSI/ANS-8.20-1991; R1999; R2005)

ANS-8.21, "Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors" (revision and consolidation of ANSI/ANS-8.21-1995; R2001 and ANSI/ANS-8.5-1996; R2002; R2007)

ANS-8.22, "Nuclear Criticality Safety Based on Limiting and Controlling Moderators" (revision of ANSI/ANS-8.22-1997; R2006)

ANS-8.24, "Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations" (revision of ANSI/ANS-8.24-2007; R2012)

ANS-8.26, "Criticality Safety Engineer Training and Qualification Program" (revision of ANSI/ANS-8.26-2007; R2012)

ANS-8.27, "Nuclear Criticality Safety Based on Limiting and Controlling Moderators" (revision of ANSI/ANS-8.27-2008)

ANS-8.28, "Administrative Practices for the Use of Non-Destructive Assay Measurements for Nuclear Criticality Safety" (proposed new standard)

ANS-8.29, "Nuclear Criticality Safety in Fuel Reprocessing Facilities" (proposed new standard)

Subcommittee 8 – Fissionable Material Outside Reactors Subcommittee

(This subcommittee is sponsored by the ANS Nuclear Criticality Safety Division.)

Scope:

The aim of this committee is to establish standards providing guidance in the prevention of nuclear chain reactions in all procedures for handling, storing, transporting, processing, and treating fissionable nuclides. ANS-8 is responsible to the consensus committee N16, Nuclear Criticality Safety.

Fissionable Material Outside Reactors Subcommittee (ANS-8) Membership:
Lon E. Paulson, Chair, GE Hitachi Nuclear Energy
Brian Kidd, Vice Chair, Babcock & Wilcox Nuclear Operations Group
Michael Crouse, Secretary, Link Solutions, Inc.
James Baker, Savannah River Site
Ernest Elliott, Defense Nuclear Facilities Safety Board
David Erickson, Savannah River Nuclear Solutions
Adolf Garcia, U.S. Department of Energy
Kevin Kimball, U.S. Department of Energy
David Kupferer, Defense Facilities Nuclear Safety Board
Sean Monahan, Sandia National Laboratory

James Morman, Argonne National Laboratory
Thomas McLaughlin, Individual
Thomas Reilly, Individual (Washington Safety Management Solutions)
Hans Toffer, Individual
Christopher Tripp, U.S. Nuclear Regulatory Commission
Dominic Winstanley, Sellafield Sites (U.K.)

Fissionable Material Outside Reactors Subcommittee (ANS-8) Report:
Thomas McLaughlin stepped down as subcommittee chair after the June 2013 ANS meeting and was replaced by Lon Paulson. The ANS-8 Subcommittee held a standards forum at each of the two national ANS conferences, Atlanta in June 2013 and Washington D.C. in November 2013. Drafts of revisions to several ANS-8 series standards were completed by their working groups and issued to ANS-8 for ballot during 2013, including the long-awaited revision to ANSI/ANS-8.1-1998 (R2007) which was moved to NCSCC for ballot. Another nine standards are being revised and two new standards have been proposed. This high-activity level is anticipated to continue in 2014.

Current Standards and Active Projects:

ANSI/ANS-8.1-1998; R2007, "Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors" (revision of ANSI/ANS-8.1-1983; R1988)

Scope:
This standard is applicable to operations with fissionable materials outside nuclear reactors, except for the assembly of these materials under controlled conditions, such as in critical experiments. Generalized basic criteria are presented and limits are specified for some single fissionable units of simple shape containing ^{233}U, ^{235}U, or ^{239}Pu, but not for multiunit arrays. Requirements are stated for establishing the validity and areas of applicability of any calculational method used in assessing nuclear criticality safety. This standard does not include the details of administrative controls, the design of processes or equipment, the description of instrumentation for process control, nor detailed criteria to be met in transporting fissionable materials.

Membership:
Doug Bowen, Co-Chair, Oak Ridge National Laboratory; Nicholas Brown, Co-Chair, Nuclear Fuel Services; Rob Beck, Paducah Gaseous Diffusion Plant; Adolf Garcia, U.S. Department of Energy; Sedat Goluoglu, University of Florida at Gainesville; Clint Gross, Paschal Solutions; Chris Haught, BWXT Y12; Jerry Hicks, U.S. Department of Energy; Maria LeTellier, CE Engineering; John Miller, SIGMA Science/Sandia National Laboratories; Lee Montierth, Idaho National Laboratory; Tom Marenchin, U.S. Nuclear Regulatory Commission; James Morman, Argonne National Laboratory; Lane Paschal, Paschal Solutions, Inc.; Lon Paulson, GE Hitachi Nuclear Energy; Kevin Reynolds, BWXT Y12; Ellen Saylor, ORNL; Fred Winstanley, British Nuclear Fuels; and Ken Woods, Paschal Solutions

Status: Reaffirmation received ANSI approval 5/16/2007. The ANS-8.1 Working Group is actively working on a revision since the PINS was approved in April of 2008. The revision is focused on editorial clarifications and enhancements to the current content including incorporating information from the clarification issued in December 2009. A draft revision to the standard was completed in the fall 2012. The ANS-8 Subcommittee approved the draft standard and sent it to the Nuclear Criticality Safety (NCS) Consensus Committee. The NCS ballot was issued on 2/22/13 and closed on 4/26/13. NCS comments have been addressed and the revised version and resolutions were sent to commenters for review. The co-chairs presented a paper to the NCSD regarding the status of the revision at the Washington DC ANS meeting in November 2013. The revision modifications are modest. Various editorial corrections have been made and definitions added to assist with clarifying the intent and meaning of the process analysis requirement and the double contingency principle recommendation. Two recommendations were added to the Technical Practices section of the

Standard and Appendices B and C were replaced with a new Appendix B intended to discuss process conditions, nuclear parameters, application of the process analysis requirement, the double contingency principle, and the relationship between the process analysis requirement and the double contingency principle. The editorial revision is being done before the calculational revision involving the addition of new subcritical limits as recommended by the ANS-8 subcommittee chair in 2009. Calculation efforts are being delayed until after the editorial revision is complete and should resume in 2014. The next revision will also consider new subcritical limits for uranium metal and compounds for enrichments up to 10 wt. % 235U. Some calculations have already been completed. A tentative list of uranium compounds have been proposed for the new calculations: UO2F2, UF4, UF6, U3O8, and UO2. Three working group meetings, one at the ANS summer meeting in Atlanta, GA ,and two at the ANS Winter meeting in Washington, DC, were held to work on the editorial revision. Telephone conferences were held earlier in the year to speed up progress on the revision. Out-of-scope comments generated as a result of the consensus committee comment resolution process will be captured in a new PINS form and addressed in a new revision.

ANSI/ANS-8.3-1997; R2003; R2012, "Criticality Accident Alarm System" (revision of ANSI/ANS-8.3-1986)

Scope:

This standard is applicable to all operations involving fissionable materials in which inadvertent criticality can occur and cause personnel to receive unacceptable exposure to radiation. This standard is not applicable to detection of criticality events where no excessive exposure to personnel is credible, nor to nuclear reactors or critical experiments. This standard does not include details of administrative actions or of emergency response actions that occur after alarm activation.

Membership:

Sean Monahan, Los Alamos National Laboratory; Mathieu Duluc, IRSN; Peter Angelo, BWXTY Y-12; Debdas Biswas, Lawrence Livermore National Laboratory; Warmer Blycert, Mohr and Associates; Edward Kendall, Department of Energy (Y-12 NSC); Ronald Pevey, University of Tennessee; Lawrence Berg, Department of Energy; Tamara Powell, U.S. Nuclear Regulatory Commission; Valerie Putman, Idaho National Laboratory; Jinging Wang, AECL

Status: Reaffirmation received ANSI approval 7/26/2012. Again, the working group has been actively involved in several inquiry responses over the past year. Each inquiry response has illustrated additional topics that need to be addressed by the working group in the upcoming revision. A revision is being worked currently by the working group that addresses these major issues. The work is progressing steadily although slowly via email and phone discussions. The development of a compendium that will describe the rationale behind the revisions and the "intent" of the requirements and recommendations will likely be generated.

ANSI/ANS-8.5-1996; R2002; R2007, "Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material" (revision of ANSI/ANS-8.5-1986)

Scope:

This standard provides guidance for the use of borosilicate-glass Raschig rings as a neutron absorber for criticality control in ring-packed vessels containing solutions of ^{235}U, ^{239}Pu, or ^{233}U. The chemical and physical environment, properties of the rings and packed vessels, maintenance inspection procedures, and operating guidelines are specified.

Membership:

Jerry Hicks, Chair, U.S. Department of Energy

Status: Reaffirmation received ANSI approval 2/23/ 2012. There has been no significant activity recently on this standard. The working group is working with the ANS-8.21 Working Group to combine this standard in a revision of ANSI/ANS-8.21.

ANSI/ANS-8.6-1983; R1988; R1995; R2001; R2010, "Safety in Conducting Subcritical Neutron-Multiplication Measurements in Situ" (revision of N16.3-1975)

Scope:

This standard provides safety guidance for conducting subcritical neutron-multiplication measurements where physical protection of personnel against the consequences of a criticality accident is not provided. The objectives of in situ measurements are either to confirm an adequate safety margin or to improve an estimate of such a margin. The first objective may constitute a test of the criticality safety of a design that is based on calculations. The second may affect improved operating conditions by reducing the uncertainty of safety margins and providing guidance to new designs.

Membership:

William Myers, Chair, Los Alamos National Laboratory; Ernie Elliott, Defense Nuclear Facilities Safety Board; Jerry Hicks, U.S. Department of Energy; Chris Haught, BWXT Y-12; Jesson Hutchinson, Los Alamos National Laboratory; John Miller, Los Alamos National Laboratory; Norman Schwers, Sandia National Laboratories

Status: Reaffirmation received ANSI approval 11/16/2010. There was not much activity for this working group in 2013. There are some questions and comments from the last reaffirmation that need to be addressed as part of the next revision/update cycle.

ANSI/ANS-8.7-1998; R2007; R2012, "Nuclear Criticality Safety in the Storage of Fissile Materials" (revision of N16.5-1975; R1982; R1987)

Scope:

This standard is applicable to the storage of fissile materials. Mass and spacing limits are tabulated for uranium containing greater than 30 wt-% ^{235}U, for ^{233}U, and for plutonium, as metals and oxides. Criteria for the range of application of these limits are provided.

Membership:

Kevin Kimball, Chair, Enercon Services, Inc.; Christian Marie Fischer, U.S. Nuclear Regulatory Commission; Ed Kendall, U.S. Department of Energy

Status: This standard was reaffirmed in 2012 on 2/23/2012. There was no working group activity in 2013. The next revision will incorporate comments received during the last reaffirmation process. It is expected that a PINS will be submitted in 2014 to initiate this revision.

ANSI/ANS-8.10-1983; R1988; R1999; R2005, "Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement" (revision of N16.8-1975)

Scope:

This standard provides criteria that may be used for operations outside of nuclear reactors with ^{235}U, ^{233}U, ^{239}Pu, and other fissile and fissionable materials in which shielding and confinement are provided for protection of personnel and the public, except for the assembly of these materials under controlled conditions (e.g., critical experiments). The standard does not include

details of administrative procedures for control (ie., management prerogatives) nor details regarding design of processes and equipment or descriptions of instrumentation for process control.

Membership:
Andrew Prichard, Chair, Pacific Northwest National Laboratory; Douglas G. Bowen, Oak Ridge National Laboratory; Linda M. Farrell, AREVA Inc.; Jerry Hicks, United States Department of Energy; Darby Kimball, Lawrence Livermore National Laboratory; Lon E. Paulson, GE Hitachi, Nuclear Energy

Status: A reaffirmation received ANSI approval 4/1/2005. A PINS form for revising ANS-8.10 was approved in 2006. The revision will address comments that were generated during the reaffirmation ballots, and comments collected by working group members. The working group was reconstituted during the ANS Winter Meeting in Washington D.C. in 2013 to continue the revision process. Weekly conference calls are planned for 2014 to continue work on and finalize the revision; the WG plans to submit formal revision to ANS Subcommittee 8 "for ballot" by end of February 2014.

ANSI/ANS-8.12-1987; R1993; R2002, R2011, "Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors" (revision of ANSI/ANS-8.12-1978)

Scope:
This standard is applicable to operations with homogeneous mixtures of plutonium and uranium. The mixtures may be solutions, suspended solids, precipitates, or may have been formed mechanically. Basic criteria are presented for plutonium-uranium fuel mixtures containing no more than 30 wt% plutonium combined with uranium containing no more than 0.71 wt% ^{235}U. This standard does not include the details of administrative controls, the design of processes or equipment, the description of instrumentation for process control, or detailed criteria to be met in transporting fissionable materials. The limits of this standard are not applicable to heterogeneous systems such as lattices of rods in water, mixtures in which particles are large enough to introduce lumping effects, or mixtures in which the concentrations of components are nonuniform. The limits are applicable, however, to homogeneous mixtures and slurries in which the particles constituting the mixture are uniformly distributed and have a diameter no larger than 127 mm (0.005 in.), i.e., are capable of being passed through a 120 mesh screen.

Membership:
Debdas Biswas, Chair, Lawrence Livermore National Laboratory; Kermit Bunde, Department of Energy, Idaho; David Erickson, Savannah River Nuclear Solutions; Jason Huffer, Consultant, Dennis Mennerdahl, EMS-Sweden; Lester Petrie, Oak Ridge National Laboratory; Scott Revolinski, Nuclear Safety Associates; Charles Robinson, Nuclear Associates; Burton Rothleder, U.S. Department of Energy; Michael J. Shea, Savaannah River MOX Project; Christopher Tripp, U.S. Nuclear Regulatory Commission; Dominic Winstanley, Sellafield-UK

Status: Reaffirmation received ANSI approval 2/11/2011. The ANS-8.12 standard was first approved in July 1978 and was revised in 1987. It was reaffirmed in 2002 and again in 2011 (ANSI/ANS-8.12-1987; R2011). A major revision activity is on-going. A decision was made to follow the ISO MOX standard specifications (related to MOX density and isotopics) and develop a new set of subcritical limits for homogeneous systems for the revision of ANS-8.12. The working group has completed MCNP and SCALE calculations for six (6) sets of subcritical data. This is a significant progress in generating subcritical limits by Monte Carlo calculations using the ISO MOX specifications. A set of critical benchmark experiments was selected for validation work. Paucity of benchmark experiments in certain energy region was identified. No working group meeting was organized during the ANS meeting in 2013 due to DOE travel restrictions and funding problems. Work is continuing to validate the calculated values and to come up with a set of subcritical parameters.

ANSI/ANS-8.14-2004; R2011, "Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors" (new standard)

Scope:

This standard provides guidance for the use of soluble neutron absorbers for criticality control. This standard addresses neutron absorber selection, system design and modifications, safety evaluations, and quality control programs.

Membership:

Lawrence Berg, Chair, U.S. Department of Energy

Status: Reaffirmation received ANSI approval 11/16/2011. ANSI/ANS-8.14 was approved May 25, 2004, and was reaffirmed in 2011. No working group activity in 2013.

ANSI/ANS-8.15-1981; R1987; R1995; R2005, "Nuclear Criticality Control of Special Actinide Nuclides" (new standard)

Scope:

This standard is applicable to operations with the following nuclides:

^{232}U, ^{234}U, ^{237}Np, ^{236}Pu, ^{238}Pu, ^{240}Pu, ^{241}Pu, ^{242}Pu, ^{241}Am, ^{242m}Am, ^{243}Am, ^{242}Cm, ^{243}Cm, ^{244}Cm, ^{245}Cm, ^{246}Cm, ^{247}Cm, ^{249}Cf, and ^{251}Cf

Subcritical mass limits are presented for isolated units. The limits are not applicable to interacting units.

Membership:

Charles Rombough, Chair, CTR Technical Services, Inc.; Roger Brewer, Los Alamos National Laboratory; Hiroshi Okuno, Japan Atomic Energy Research Institute; Timothy Sippel, U.S. Nuclear Regulatory Commission; R. Michael Westfall, Oak Ridge National Laboratory

Status: Reaffirmation received ANSI approval 7/15/2005. The ANS-8.15 standard was initially approved in 1981 and was reaffirmed in 1987, 1995, and 2005. A PINS form for revising ANS-8.15 was submitted and approved in 2010. The revision revises most of the subcritical limits for the original 14 nuclides in the 1981 standard and adds 5 additional nuclides bringing the total number of nuclides to 19. The revision has undergone several drafts in response to comments from the ANS-8 Subcommittee. The working group anticipates a draft being ready for NCSCC ballot in early 2014.

ANSI/ANS-8.17-2004; R2009, "Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors" (revision of ANSI/ANS-8.17-1984; R1989; R1997)

Scope:

This standard provides nuclear criticality safety criteria for the handling, storage, and transportation of light water reactor fuel rods and units outside reactor cores.

Membership:

Brian O. Kidd, Chair, Babcock & Wilcox Nuclear Operations Group; Dale Lancaster, NuclearConsultants.com; Calvin Manning, AREVA; Cecil Parks, Oak Ridge National Laboratory; Stanley Turner, Holtec International

Status: Reaffirmation received ANSI approval on 9/14/2009. There has been no recent activity. The reaffirmation process will be initiated in early 2014.

ANSI/ANS-8.19-2005, "Administrative Practices for Nuclear Criticality Safety" (revision of ANSI/ANS-8.19-1996)

Scope:

This standard provides criteria for the administration of a nuclear criticality safety program for outside-of-reactor operations in which there exists a potential for criticality accidents. Responsibilities of management, supervision, and the nuclear criticality safety staff are addressed. Objectives and characteristics of operating and emergency procedures are included.

Membership:

Bill Carson, Chair, ENERCON Federal Services, Inc.; Jim Baker, Savannah River Site; Gregory Goff, U.S. Nuclear Regulatory Commission; Tom Marenchin, U.S. Nuclear Regulatory Commission

Status: This standard was approved by ANSI on 5/16/2005. A PINS form for a revision was approved in 2007. A draft was completed and approved by the ANS-8 Subcommittee. The draft was then issued to the NCS Consensus Committee for ballot on 3/22/13 that closed on 5/23/13. Resolutions were issued to NCS commenters. The working group is waiting to see if commenters are satisfied.

ANSI/ANS-8.20-1991; R1999; R2005, "Nuclear Criticality Safety Training" (new standard)

Scope:

This standard provides criteria for nuclear criticality safety training for personnel associated with operations outside reactors where a potential exists for criticality accidents. It is not sufficient for the training of nuclear criticality safety staff.

Membership:

Ronald A. Knief, Chair, Sandia National Laboratories; Nichole Ellis, Vice Chair, Ellis Nuclear Engineering; Wayne Andrews, Defense Nuclear Facilities Safety Board; Paul Burdick, Washington Safety Management Solutions; Christopher Haught, B&W/Y-12; Deborah Hill, National Nuclear Laboratory (UK); Jesse McBurney-Rebol, Bechtel Marine Propulsion Corp.; Allison Miller, Sandia National Laboratories; Thomas Marenchin, U.S. Nuclear Regulatory Commission; Christine Racicot McNally, Atomic Energy of Canada Ltd.; Randy Shackelford, Nuclear Fuel Services; Robert P. Taylor, Westinghouse Electric Company

Status: The last reaffirmation was approved 9/16/2005. Following the June 2012 ANS Annual Meeting in Chicago, a draft standard was submitted for ballot to ANS-8. The ballot was returned with substantive comments. Comment resolution began at the ANS Winter Meeting in San Diego and continued into mid-2013. A new draft has been submitted to ANS-8 for ballot. The working group will plan to convene at the upcoming 2014 ANS annual and winter meetings, as appropriate.

ANSI/ANS-8.21-1995; R2001, R2011, "Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors" (new standard)

Scope:

This standard provides guidance for the use of fixed neutron absorbers as an integral part of nuclear facilities and fissionable material process equipment outside reactors, where such absorbers provide criticality safety control.

Membership:
David Erickson, Chair, SRNS; Kevin Carroll, LLNL; Phillip Chou, LLNL; Adolf S. Garcia, U.S. DOE; Katherin Goluoglu, ORNL; Jerry Hicks, U.S. DOE; Dennis Mennerdahl, E. M. Systems-Sweden; Hans Toffer, Individual; Robert Wilson, U.S. DOE; Emma Wong, U.S. Nuclear Regulatory Commission

Status: Reaffirmation received ANSI approval 5/20/2011. Work continues on the revision. Due to travel constraints the working group did not meet in CY13. Comments received during reaffirmation still require some additional changes to address. Drafting of the appendices is continuing.

ANSI/ANS-8.22-1997; R2006, R2011, "Nuclear Criticality Safety Based on Limiting and Controlling Moderators" (new standard)

Scope:
This standard applies to limiting and controlling moderators to achieve criticality safety in operations with fissile materials in a moderator control area. This standard does not apply to concentration control of fissile materials.

Membership:
Michael Crouse, Chair, Link Solutions, Inc.; Marvin Barnett, URS Safety Management Solutions; Donna D'Aquila, PORTS; Sean Gough, Westinghouse Electric Company; Chris Haught, Y-12; Deborah Hill, NNL, UK; Thomas Marenchin, U.S. Nuclear Regulatory Commission; Robert Maurer, Nuclear Fuel Services; Rahn Ross, SRS; Burton Rothleder, U.S. DOE; Richard Stachowiak, Fluor Government Group

Status:
This standard was reaffirmed in 2011. This working group did not meet this year (2013). A PINS is being developed to start a revision to this standard.

ANSI/ANS-8.23-2007; R2012, "Nuclear Criticality Accident Emergency Planning and Response" (revision of ANSI/ANS-8.23-1997)

Scope:
This standard provides criteria for minimizing risks to personnel during emergency response to a nuclear criticality accident outside reactors. This standard applies to those facilities for which a criticality accident alarm system, as specified in American National Standard Criticality Accident Alarm System, ANSI/ANS-8.3-1997;R2003,is in use. This standard does not apply to nuclear power plant sites, or to those licensed research reactor facilities, which are addressed by other standards.

Membership:
James S. Baker, Chair, Savannah River Site; Peter L. Angelo, Y-12 National Security Complex; R. W. (Bill) Carson, Enercon Services, Inc.; Neil Harris, Sellafield, Ltd.; Tracey L. Henson, USEC; Calvin Hopper, Individual; C.S. (George) Lim, AECL Chalk River Laboratories; Valerie L. Putman, Idaho National Laboratory; Raymond L. Reed, URS Safety Management Solutions; Ludovic Reverdy, CEA Valduc, France

Status: Reaffirmation received ANSI approval 5/31/2012. No requests for clarification or interpretation have been received since Revision 1 of ANSI/ANS-8.23 was issued in 2007. The primary issue for the ANS-8.23 standard is the lack of a current reference for criticality accident dosimetry. The previous criticality accident dosimetry standard, N13.3, is withdrawn due to lack of maintenance/revision. The N13.3 Working Group has been revived, and has produced a new draft standard that is undergoing review. James Baker is the liaison between the ANS-8.23 and N13.3 working groups. The ANS-8.23 Working Group intends to begin a revision upon completion of the

new N13.3. Other suggestions and comments on ANS-8.23 that the working group has received will be addressed at that time.

ANSI/ANS-8.24-2007; R2012, "Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations" (new standard)

Scope:

This standard provides requirements for validation, including establishing applicability, of neutron transport calculational methods used in determining critical or subcritical conditions for nuclear criticality safety analyses.

Membership:

Larry Wetzel, Chair, Babcock & Wilcox Nuclear Operations Group; Robert Busch, University of New Mexico; Clint Gross, Paschas, Associates; Jerry Hicks, U.S. DOE; Kevin Kimball, Enercon Services; Cecil Parks, Oak Ridge National Laboratory; Andrew Prichard, Pacific NW National Laboratory; Robert Tayloe, R. Tayloe Engineering Consultancy, Inc.; Christopher Tripp, U.S. Nuclear Regulatory Commission; Fitz Trumble, Washington Safety Management Solutions

Status: The standard was reaffirmed on 5/31/2012. The PINS to initiate a revision was issued to ANS-8 for approval. ANS-8 comments on the PINS are currently being addressed.

ANSI/ANS-8.26-2007, "Criticality Safety Engineer Training and Qualification Program" (new standard)

Scope:

This standard presents the fundamental content elements of a training and qualification program for Individuals with responsibilities for performing the various technical aspects of criticality safety engineering. The standard presents a flexible array of competencies for use by management to develop tailored training and qualification programs applicable to site-specific job functions, facilities and operations.

Membership:

James Morman, Chair, Argonne National Laboratory; Joye Brotherton, Savannah River Site; Kevin Carroll, BWXT Y12 LLC; James Felty, U.S DOE; Adolf S. Garcia, US Department of Energy NE-ID; Makenzie Gorham, US Department of Energy NE-ID; Calvin Hopper, Individual; Steve Kessler, Lawrence Livermore National Laboratory; Ronald Knief, Sandia National Laboratories; William (Bill) Lee, U.S. DOE; Robert Maurer, Nuclear Fuel Services; Jerry McKamy, U.S. Department of Energy; Lon E. Paulson, GE Hitachi Nuclear Energy; Ronald E. Pevey, University of Tennessee; Chad L. Pope, Idaho State University; Kevin Reynolds, Y12 National Security Complex; Bonnie Rumble, Paschal Solutions, Inc.; Norm Schwers, Sandia National Laboratories; Fitz Trumble, URS Professional Solutions; Sheena Whaley, Nuclear Regulatory Commission; Robert E. Wilson, U.S. Department of Energy

Status: The standard was reaffirmed on 5/31/12. A PINS form for revising ANS-8.26 was submitted in October 2012 and approved August 16, 2013. The revision will address comments that were generated during the reaffirmation ballots, and comments collected by working group members. The working group met during the ANS Winter Meeting in Washington D.C. to continue the revision process. A proposed appendix to the standard was discussed that would capture many of the detailed knowledge areas from DOE-STD-1135, which might be retired in favor of ANS-8.26. Conference calls and working group meetings are planned for 2014 to continue work on the revision.

ANSI/ANS-8.27-2008, "Burnup Credit for LWR Fuel" (new standard)

Scope:

The standard provides criteria for processes and techniques used for criticality safety evaluations of irradiated light water reactor fuel assemblies in storage, transportation and disposal.

Membership:

Dale Lancaster, Chair, NuclearConsultants.com; Charles Rombough, Secretary, CTR Technical Services, Inc.; Stefan Anton, Hotlec International; Tony Attard, U.S. Nuclear Regulatory Commission; Steve Baker, TransWare Enterprises; Andrew Barto, U.S. Nuclear Regulatory Commission; Jack Boshoven, TransNuclear, Inc.; Mikey Brady Raap, Battelle-Pacific Northwest National Lab; Joe Coletta, Duke Power; Mark DeHart, INL; Michael DeVoe, Progress Energy Carolinas; Jeffrey Dunlap, Exelon Corp.; Jim Gulliford, Nexia Solutions; John Hannah, Global Nuclear Fuels; Robin Jones, Southern Nuclear Operating Co.; John Kessler, EPRI; Ed Knuckles, Florida Power & Light; Vefa Kucukboya, Westinghouse; William Lake, Individual; Caroline Laverenne, Institute for Radiological Protection & Nuclear Safety; Albert Machiels, EPRI; Ludmila Markova, Nuclear Research Institute; Zita Martin, Tennessee Valley Authority; Mike Mason, TransNuclear, Inc.; John Massari, Constellation Energy; Dennis Mennerdahl, Individual; Walid Metwally, Global Nuclear Fuels; Webb Mills, Global Nuclear Fuels; Susumu Mitake, Japan Nuclear Energy; Don Mueller, ORNL; Prakash Narayanan, TransNuclear Inc.; Greg O'Connor, Department for Transport, UK; Paul O'Donnell, Individual; Cecil Parks, Oak Ridge National Laboratory; Holger Pfiefer, Nuclear Analysis Company International; Jerome Raby, Institute for Radiological Protection & Nuclear Safety; Meraj Rahimi, U.S. Nuclear Regulatory Commission; Everett Redmond, NEI; Dan Thomas, AREVA; John Wagner, ORNL; Chris Walker, Entergy; Alan Wells, EPRI; Kent Wood, U.S. Nuclear Regulatory Commission; Al Zimmer, General Atomics; John Zino, GE Nuclear

Status: This standard received ANSI approval on 8/14/2008. A PINS for a revision of ANSI/ANS-8.27-2008 was approved August 2013. The new version of the standard was worked on by email and then finally approved by the working group at a meeting on October 2, 2013, at the NCSD meeting. The current draft standard was approved by the working group and was submitted for comment to ANS-8. Initial ANS-8 comments were editorial in nature and expected to be easily addressed. The working group expects to address ANS-8 comments in early 2014. The working group also discussed future plans for a subsequent revision (about 2019) of the standard at the October 2, 2013, meeting. It is expected that the next version will benefit from current efforts of NEI for spent fuel pools and the release of ISG-8, Rev. 3.

ANS-8.28, "Administrative Practices for the Use of Non-Destructive Assay Measurements for Nuclear Criticality Safety" (proposed new standard)

Scope:

This standard provides administrative practices covering the interface between the criticality safety community and the NDA community including in-situ measurements and measurements of containerized materials.

Membership:

Ernest Elliott, Chair, Oak Ridge National Laboratory; Larry Berg, Co-Chair, U.S. DOE; Mikey Brady Raap, PNNL; David Dolin, SRS; Nichole Ellis, Individual; Robert Hayes, Nuclear Waste Partnership, LLC; David Kirckwood, Sellafield, Ltd.; Frank Lamb, Individual; Jerry McKamy, U.S. DOE; Tom Nirider, U.S. DOE; Bob Wilson, U.S. DOE; John Winkel, Hanford; Fred Winstanley, Sellafield, Ltd.

Status: The PINS form has been approved and was submitted to ANSI on 1/28/2011. The working group had a few teleconferences during the year and some of the working group members met during

the ANS winter meeting in Washington, DC. The working group has produced two drafts of the proposed standard and is commenting on the latest version as well as on the scope, goals, and overall objectives for the standard. Additional members have been added to the working group during the year; we now have good representation from all sectors of the criticality safety and NDA communities. Members of the working group represent the US and the UK, NRC and DOE, NCS and NDA practitioners, as well as site and oversight personnel.

ANS-8.29, "Nuclear Criticality Safety in Fuel Reprocessing Facilities" (proposed new standard)

Unapproved Scope:

This standard provides guidance for criticality safety in nuclear fuel reprocessing facilities. It supplements the general guidance set forth in ANSI/ANS 8.1-1998 (R2007). Safe subcritical theoretical values of mass, volume and concentration (as applicable) are presented for pertinent solutions of mixtures of uranium, plutonium and minor actinides for aqueous reprocessing. Also provided are safe subcritical values of mass, volume and concentration (as applicable) of mixtures of fissile material and salts used in electrochemical reprocessing.

Membership:

Adolph Garcia, Chair, U.S. Department of Energy; Brian Collins, Pacific Northwest National Laboratory; Matthieu Duluc, Institute for Radiological Protection & Nuclear Safety; Eric Guillou, AREVA; Jerry Hicks, U.S. Department of Energy; Thomas Marechin, U.S. Nuclear Regulatory Commission; Dennis Mennerdahl, E. Mennerdahl Systems; Leland Montierth, Idaho National Laboratory; James A. Morman, Argonne National Laboratory; Andrew Prichard, Pacific Northwest National Laboratory; James Rendell, Sellafield Ltd.; Helen Saylor, Oak Ridge National Laboratory; Wade Scates, Idaho National Laboratory; Christopher Tripp, U.S. Nuclear Regulatory Commission; Robert Wilson, U.S. Department of Energy; Dominic Winstanley, Sellafield Ltd.

Status: Proposed ANS-8.29 was given approval to formalize the working by Subcommittee 8 in 2012. A PINS form was presented for consideration and was approved by ANS Subcommittee 8 in 2013, but came back with a lots of comments from the Nuclear Criticality Safety (NCS) Consensus Committee indicating that a better justification for the need for this standard needed to be provided. The working group met during the ANS Winter Meeting in Washington, D.C. A subgroup of the working group is in the process of addressing the issue of "need," and will revise the draft PINS form to include NCS comments. The draft response to NCS will be finalized at the working group meeting during the ANS 2014 annual meeting in Reno. At least four conference calls meetings are planned for 2014.

Nuclear Criticality Safety (NCS) Consensus Committee List of Standards/Projects

Chair: Robert D. Busch Vice Chair: Larry L. Wetzel

Fissionable Materials Outside Reactors Subcommittee (ANS-8)
Chair: Lon Paulson

ANS-8.1-1998; R2007	Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors	RF 5/16/2007
ANS-8.3-1887; R2007; R2012	Criticality Accident Alarm System	RF 7/26/2012
ANS-8.5-1996; R2002; R2007; R2012	Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material	RF 2/23/2012
ANS-8.6-1983; R1988; R1995; R2001; R2010	Safety in Conducting Subcritical Neutron-Multiplication Measurements In Situ	RF 11/16/2010
ANS-8.7-1998; R2007; R2012	Nuclear Criticality Safety in the Storage of Fissile Materials	RF 2/23/2012
ANS-8.10-1983; R1988; R1999; R2005	Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement	RF 4/1/2005
ANS-8.12-1987; 1993; R2002; R2011	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors	RF 2/11/2012
ANS-8.14-2004; 2011	Use of Soluable Neutron Absorbers in Nuclear Facilities Outside Reactors	RF 11/16/2011
ANS-8.15-1981; R1987; R1995; R2005	Nuclear Criticality Control of Special Actinide Elements	RF 7/15/2005
ANS-8.17-2004; R2009	Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors	RF 9/14/2009
ANS-8.19-2005	Administrative Practices for Nuclear Criticality Safety	Approved 5/16/2005
ANS-8.20-1991; R1999; R2005	Nuclear Criticality Safety Training	RF 9/16/2005
ANS-8.21-1995; R2001; R2011	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors	RF 5/19/2011
ANS-8.22-1997; R2006; R2011	Nuclear Criticality Safety Based on Limiting and Controlling Moderators	RF 11/11/2011
ANS-8.23-2007; R2012	Nuclear Criticality Accident Emergency Planning and Response	RF 5/31/2012
ANS-8.24-2007; R2012	Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations	RF5/31/2012
ANS-8.26-2007; R2012	Criticality Safety Engineer Training and Qualification Program	RF 5/31/2012
ANS-8.27-2008	Burnup Credit for Light Water Reactor Fuel	RF 8/14/2008
ANS-8.28-201x	Administrative Practices for the Use of Non-Destructive Assay Measurements for Nuclear Criticality Safety	Active Project
ANS-8.29-201x	Nuclear Criticality Safety in Fuel Reprocessing Facilities	Proposed Project

Table 1 – NCS List of Standards/Projects

Environmental and Siting (ES) Consensus Committee

Carl A. Mazzola, Chair
CB&I Special Projects Group

Scope:

The ES Consensus Committee is responsible for the preparation and maintenance of voluntary consensus standards for all aspects of nuclear power plant and nonreactor nuclear facility siting, environmental assessment, environmental management, environmental monitoring, and the categorization and evaluation of natural phenomena hazards at these public and private sector nuclear facilities.

Many of the ES standards presently support the siting and environmental needs of the civilian nuclear industry and the Department of Energy (DOE) in meeting 10 CFR 50, 10 CFR 51 and 10 CFR 52 licensing requirements and assisting with compliance to 40 CFR enabling regulations associated with the Clean Air Act, Clean Water Act, Safe Drinking Water Act, Resource Conservation and Recovery Act, Comprehensive Environmental Response Compensation and Liability Act, Toxic Substances Control Act, and National Environmental Policy Act. The ANS Standards Committee Procedures Manual for Consensus Committees shall be used to guide the activities of this consensus committee.

The Environmental and Siting Consensus Committee supervises the work of the following subcommittees. They are as follows:

Environmental and Impact Assessment
Siting: Atmospheric
Siting: Hydrogeologic
Siting: Seismic
Siting: Ecology
Siting: General and Monitoring

ES Membership:

Carl A. Mazzola, Chair, CB&I Special Projects Group
Yan Gao, Vice Chair, Westinghouse Electric Company

Thomas Bellinger, Y-12 National Security Complex
Lisa Brandon, Geosyntec Consultants, Inc.
Kevin Bryson, Individual
Jennifer Call, Tennessee Valley Authority
Robert Carpenter, U.S. Nuclear Regulatory Commission
John Downing, Chicago Bridge & Iron
Brad Harvey, U.S. Nuclear Regulatory Commission
Quazi Hossain, Lawrence Livermore National Security
R. Joseph Hunt, B&W Y-12, LLC
Gerald Meyers, U.S. Department of Energy
Leah Parks, U.S. Nuclear Regulatory Commission
Todd Rassmussen, University of Georgia
Jean Savy, Individual
John Stevenson, Individual
Steven Vigeant, CB&I Federal Services

Report of the ES:

The ES held its inaugural meeting on November 13, 2013, during the ANS Winter Meeting in Washington D.C.

Approved in 2013:
ANS-2.15-2013, "Criteria for Modeling and Calculating Atmospheric Dispersion of Routine Radiological Releases from Nuclear Facilities" (new standard)

Active standards/projects:

ANS-2.2, "Earthquake Instrumentation Criteria for Nuclear Power Plants" (historical revision of ANSI/ANS-2.2-2002 – proposed new standard)

ANS-2.8, "Determination of External Flood Hazards for Nuclear Facilities" (historical revision of ANSI/ANS-2.8-1992 – proposed new standard)

ANS-2.9, "Evaluation of Ground Water Supply for Nuclear Facilities" (historical revision of ANSI/ANS-2.9-1980; R1989 – proposed new standard)

ANS-2.10, "Criteria for the Handling and Initial Evaluation of Records from Nuclear Power Plant Seismic Instrumentation" (historical revision of ANSI/ANS-2.10-2003 – proposed new standard)

ANS-2.16, "Criteria for Modeling Design-Basis Accidental Releases from Nuclear Facilities" (proposed new standard)

ANS-2.18, "Standards for Evaluating Radionuclide Transport in Surface Water for Nuclear Power Sites" (proposed new standard)

ANS-2.21, "Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink" (proposed new standard)

ANS-2.23, "Nuclear Plant Response to an Earthquake" (revision of ANSI/ANS-2.23-2002; R2009)

ANS-2.30, "Assessing Capability for Surface Faulting at Nuclear Facilities" (proposed new standard)

ANS-2.31, "Standard for Estimating Extreme Precipitation at Nuclear Facility Sites" (proposed new standard)

ANS-3.8.10, "Criteria for Modeling Real-Time Accidental Release Consequences at Nuclear Facilities" (proposed new standard)

ANS-3.11, "Determining Meteorological Information at Nuclear Facilities" (revision of ANSI/ANS-3.11-2005; R2010)

Environmental and Impact Assessment and Analysis Subcommittee

Membership:
Kevin Bryson, Chair, Individual

The Environmental and Impact Assessment and Analysis Subcommittee manages the following projects:

ANS-18.2.1, "Methods for Inferring Environmental Doses" (proposed standard under consideration)

ANS-18.8, "Guidelines for Environmental and Economic Analysis of the Regional Effects of Power Facilities" (proposed standard under consideration)

ANS-18.9, "Environmental Impact Evaluation" (proposed standard under consideration)

Siting: Atmospheric Subcommittee

Membership:
John D. Stevenson, Chair, Individual
John Ciolek, AlphaTRAC, Inc.
Stephen Vigeant, Chicago Bridge & Iron Federal Services

The Siting: Atmospheric Subcommittee oversees the following projects:

ANSI/ANS-2.3-2011, "Estimating Tornado, Hurricane, and Extreme Straight Line Wind Characteristics at Nuclear Facility Sites" (historical revision of ANSI/ANS-2.3-1983 – new standard)

Scope:
This standard defines site phenomena caused by (1) extreme straight winds, (2) hurricanes, and (3) tornados in various geographic regions of the U.S. These phenomena are used for the design of nuclear facilities.

Membership:
John D. Stevenson, Chair, Individual; Mo Amin, Sargent & Lundy Engineers; Art Buslick, U.S. Nuclear Regulatory Commission; Antonio Godoy, IAEA; Brad Harvey, U.S. Nuclear Regulatory Commission; Quazi A. Hossein, LLNL; Jeff Kimball, Defense Nuclear Facilities Safety Board; Carl A. Mazzola, CB&I Special Services, Inc.; James R. McDonald, Individual; Sujit K. Samaddar, U.S. Nuclear Regulatory Commission; Emil Simiu, NIST

Status: This standard received ANSI approval 4/22/2011. The current standard covers the application of natural hazard wind effects to nuclear facilities. It should be noted that the standard is probabilistic in nature such that all wind design basis effects are a function of mean return periods. There is no current ANS activity relative to this standard other than to encourage its adoption, whole or in part, by the NRC in its relevant RGs and SRPs. It is being referenced in current DOE standards on the subject.

ANSI/ANS-2.15-2013, "Criteria for Modeling and Calculating Atmospheric Dispersion of Routine Radiological Releases from Nuclear Facilities" (new standard)
Scope:
This standard establishes criteria for using meteorological data collected at nuclear facilities to evaluate the atmospheric effects on routine radioactive releases, including dilution, dispersion, plume rise, plume meander, aerodynamic effects of buildings, dry, deposition, and wet deposition (e.g., precipitation scavenging).

Membership:

John Ciolek, Chair, AlphaTRAC, Inc.; Cliff Glantz, Co-chair, Pacific Northwest National Laboratory; Mark Abrams, ABS Consulting, Inc.; Ron Baskett, Lawrence Livermore National Laboratory; Tom Bellinger, Y-12 National Security Complex; David Brown, Nuclear Regulatory Commission; Mark Carroll, Murray & Trettel, Inc. Weather Command; J. Toree Cook, Tennessee Valley Authority; Jim Fairobent, Department of Energy (DOE) National Nuclear Security Administration (NNSA) NA-41; Brad Harvey, Office of New Reactors, U.S. Nuclear Regulatory Commission; Chuck Hunter, Savannah River National Laboratory; Alex Kasprak, MA Highway; Marsha Kinley, Duke Energy (EC13K); Y. J. Lin, Bechtel Power Corp.; John Nasstrom, NARAC-IMAAC Deputy Program Leader, Lawrence Livermore National Carl Laboratory; Mike Mazaika, Nuclear Regulatory Commission; Mazzola, CB&I Special Services; Ed McCarthy, Pacific Gas & Electric Co.; Matt Parker, Savannah River National Laboratory; Doyle E Pittman, Tennessee Valley Authority (retired); Jeremy Rishel, Pacific Northwest National Laboratory; A Kelly Scott, Savannah River National Laboratory; Ali Simpkins, Dade Moeller & Associates; Steve Vigeant, Shaw Group; Ping Wan, Bechtel Power Corporation; Ken Wastrack, Tennessee Valley Authority

Status: This standard was approved by ANSI on 2/27/13. A ballot for approval of substantive changes was issued at the end of 2012. The ballot closed 1/4/2013 and consensus was declared. After certification by the ANS Standards Board, documents were sent to ANSI requesting their final approval. The standard was formally approved by ANSI on 2/27/13 and published shortly thereafter.

ANS-2.16, "Criteria for Modeling Design-Basis Accidental Releases from Nuclear Facilities" (proposed new standard)

Scope:

This standard establishes criteria for using meteorological data collected at nuclear facilities to evaluate the atmospheric effects on accidental radioactive and chemical releases, including dilution, dispersion, plume rise, plume meander, aerodynamic effects of buildings, dry deposition, and wet deposition (e.g., precipitation scavenging). These criteria may also be useful in Department of Homeland Security (DHS) consequence assessments.

Membership

John Ciolek, Chair, AlphaTRAC, Inc.; Jeremy Rishel, Co-chair, Pacific Northwest National Laboratory; Mark Abrams, ABS Consulting, Inc.; Ron Baskett, Lawrence Livermore National Laboratory; Tom Bellinger, Y-12 National Security Complex; Mark Carroll, Murray & Trettel, Inc. Weather Command; Toree Cook, Tennessee Valley Authority; Jim Fairobent, Department of Energy (DOE) National Nuclear Security Administration (NNSA) NA-41; Cliff Glantz, Pacific Northwest National Laboratory; Brad Harvey, Office of New Reactors, U.S. Nuclear Regulatory Commission; Chuck Hunter, Savannah River National Laboratory; Marsha Kinley, Duke Energy (EC13K); Y. J. Lin, Bechtel Power Corp.; Carl Mazzola, CB&I Special Services; Ed McCarthy, Pacific Gas & Electric Co.; John Nasstrom, NARAC-IMAAC Deputy Program Leader, Lawrence Livermore National Laboratory; James O'Brien, Department of Energy (DOE); Matt Parker, Savannah River National Laboratory; Doyle E. Pittman, Tennessee Valley Authority (retired); Ali Simpkins, Dade Moeller & Associates; Steve Vigeant, Shaw Group; Ping Wan, Bechtel Power Corporation; Ken Wastrack, Tennessee Valley Authority

Status: The PINS was approved and submitted to ANSI in 2005. Work on the standard was anticipated to be initiated now that ANSI/ANS-2.15-2013 has been approved

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ANSI/ANS-2.21-2012, "Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink" (new standard)

Scope:

This standard establishes criteria for use of meteorological data collected at nuclear facilities to evaluate the atmospheric effects from meteorological parameters (e.g., dry-bulb temperature/wet-bulb temperature differential, precipitation, wind speed, short wave radiation, incoming solar (short wave) radiation, surface water temperature, and atmospheric pressure) on ultimate heat sinks.

Membership:

Steve Vigeant, Chair, Shaw Environmental; Chris Cook, U.S. Nuclear Regulatory Commission; Brad Harvey, U.S. Nuclear Regulatory Commission; Stan Gardocki, U.S. Nuclear Regulatory Commission; Robert Kannor, Bechtel Power; Al Garrett, SRNL; Matt Parker, SRNL

Status: This standard was approved by ANSI on 6/5/2012. There was no activity on this standard during the year of 2013 and no current planned activities.

ANS-2.31, "Standard for Estimating Extreme Precipitation at Nuclear Facility Sites" (proposed new standard)

Scope:

The scope of this standard address extreme natural site hazards associated with precipitation (rain, snow, ice and their combination) which are applicable to structures, systems and components in nuclear safety-related facilities with probabilities of exceedence or return periods consistent with extreme design basis category wind, flood and earthquake phenomena (i.e. ANS-2.1, ANS-2.3, ANS-2.8, ANS-2.14, ANS-2.26, ANS-2.27 and ANS-2.29).

Membership:

John D. Stevenson, Chair, Individual (J. D. Stevenson & Associates); Carl Mazzola, CB&I Special Services; Matt Carney, Bechtel National, Inc.; Yan Gao, Westinghouse Electric Co.; Quazi Hossain, Lawrence Livermore National Laboratory; Daniel Howell, FM Global; Roy Hunt, DOE; Joseph Kanney, U.S. Nuclear Regulatory Commission, Yonas Kinfu, Bechtel Power Corporation; Kit Ng, Bechtel Power Corporation; Davis Rosowsky, Rensselaer Polytechnic Institute; Walter Schalk, NNSS Weather, John Stevenson, J.D. Stevenson, Consulting Engineer; Stephen Vigeant, Shaw Environmental, Inc.; Stephen Weinbeck, Bechtel Power Corporation; Wesley Wu, Bechtel Power Corporation

Status: The PINS were approved and submitted to ANSI in 2009. Revision 3 of the draft standard was reviewed by the working group in early 2013. It is anticipated that a 4th revision will be issued to the working group for ballot in 2014.

ANS-3.8.10, "Criteria for Modeling Real-time Accidental Release Consequences at Nuclear Facilities" (proposed new standard)

Scope:

This standard establishes criteria for use of meteorological data collected at nuclear facilities or nearby stations to evaluate in real time the atmospheric effects of all anticipated accidental radioactive and hazardous chemical releases during emergencies, including atmospheric transport and dispersion These criteria may also be useful in Department of Homeland Security (DHS) emergency response consequence assessments.

Membership:

John Ciolek, Chair, AlphaTRAC, Inc.; Cliff Glantz, Co-chair, Pacific Northwest National Laboratory; Mark Abrams, ABS Consulting, Inc.; Ron Baskett, Lawrence Livermore National Laboratory; Tom Bellinger, Y-12 National Security Complex; Jay Boris, Naval Research Lab; Roger Brode, Environmental Protection Agency; Mark Carroll, Murray & Trettel, Inc. Weather Command; Joseph Chang, Department of Homeland Security; Toree Cook, Tennessee Valley Authority; Bruce Egan, Egan Environmental; Jim Fairobent, Department of Energy (DOE) National Nuclear Security Administration (NNSA) NA-41; Brad Harvey, Office of New Reactors, U.S. Nuclear Regulatory Commission; Steve Hanna, Hanna Consultants; Chuck Hunter, Savannah River National Laboratory; Marsha Kinley, Duke Energy (EC13K); Y. J. Lin, Bechtel Power Corp.; John Nasstrom,NARAC-IMAAC Deputy Program Leader, Lawrence Livermore National Laboratory; Carl Mazzola, CB&I Special Services; Ed McCarthy, Pacific Gas & Electric Co.; Matt Parker, Savannah River National Laboratory; Doyle E Pittman, Tennessee Valley Authority (retired); Jeremy Rishel, Pacific Northwest National Laboratory; Kelly Scott, Savannah River National Laboratory; Ali Simpkins, Dade Moeller & Associates; Steve Vigeant, Shaw Group; Ping Wan, Bechtel Power Corporation

Status: Work will begin on a draft of ANS-3.8.10 once ANS-2.16 is in the review phase. The PINS was approved and submitted to the ANSI in November 2006.

Siting: Ecology Subcommittee

Membership:

John Downing, Chair, Chicago Bridge & Iron

The Siting: Ecology Subcommittee manages the following projects and current standards:

ANS-2.25, "Surveys of Ecology Needed to License Nuclear Facilities" (historical revision of ANSI/ANS-18.5-1982; R1989; redesignated ANS-2.25 – proposed new standard)

Scope:

There is a need for guidance on suitable survey techniques to evaluate potential effects of a nuclear facility on surrounding ecology. This standard discusses the need developers of nuclear facilities have for information on the terrestrial and aquatic environment. Facilities include uranium enrichment facilities, fuel fabrication facilities, reactors, interim storage facilities, reprocessing facilities, low/high level waste disposal facilities, DOE GNEP facilities and other DOE owned/operated facilities. The previous standard was withdrawn for administrative reasons and will be reinvigorated to include present conditions and to coincide with current regulations.

Membership:
OPEN

Status: No activity in 2013. This project is on hold until a chair and working group members are found.

ANS-18.3.1, "Entrainment: Guide to Steam Electric Power Plant Cooling System Siting, Design and Operation for Controlling Damage to Aquatic Organisms" (proposed new standard under consideration)

ANS-18.3.2, "Cold Shock: Guide to Steam Electric Power Plant Cooling System Siting, Design and Operation for Controlling Damage to Aquatic Organisms" (proposed new standard under consideration)

ANS-18.3.3, "Entrapment/Impingement: Guide to Steam Electric Power Plant Cooling System Siting, Design and Operation for Controlling Damage to Aquatic Organisms at Water Intake Structures" (proposed new standard under consideration)

ANS-18.4, "Aquatic Ecological Surveys Required for Siting, Design, and Operation of Thermal Power Plants" (proposed new standard under consideration)

ANS-18.6, "Discharge of Thermal Effluents into Surface Waters" (proposed new standard under consideration)

Siting: General & Monitoring Subcommittee

Membership:
Lisa Brandon, Chair, Geosyntec Consultants, Inc.
Thomas Bellinger, Y-12 National Security Complex
Jennifer Call, Tennessee Valley Authority

Siting: General and Monitoring Subcommittee manages the following projects and current standards:

ANS-2.6, "Guidelines for Estimating Present & Forecasting Future Population Distributions Surrounding Power Reactor Sites" (proposed new standard under consideration)

Scope:

Unapproved scope from draft PINS: This standard provides guidance on suitable methodologies for developing estimates and forecasts of human population distribution around civilian and Federal nuclear facility sites. The standard is intended to provide applicants and DOE/NNSA professionals with methodologies that are generally acceptable in the demographic community and to facilitate the NRC review of site suitability relative to population considerations.

Membership:
NONE

Status: No activity. Resurrection of inactive project being considered.

ANS-2.22, "Environmental Radiological Monitoring at Nuclear Facilities" (proposed new standard)

Scope:

This standard establishes criteria for use in developing and implementing an integrated radiological environmental monitoring program focusing on ambient air, surface water, and biota. It also provides criteria on the use of resultant environmental data collected near nuclear facilities to evaluate the impact of facility operations on the surrounding population and environment.

Membership:
NONE

Status: No activity. Resurrection of inactive project being considered.

ANSI/ANS-3.11-2005; R2010, "Determining Meteorological Information at Nuclear Facilities" (revision of ANSI/ANS-3.11-2000)

Scope:

The standard includes the identification of which meteorological parameters should be measured, parameter accuracies, meteorological tower siting considerations, data monitoring methodologies, data reduction techniques and quality assurance requirements.

Membership:
Mark Abrams, ABS Consulting; Robert Banta, NOAA; Ronald Baskett, Lawrence Livermore National Laboratory; Kevin Birdwell, Oak Ridge National Laboratory; Patrict T. Brennan, Meteorological Evaluation Services; Mark Carroll, Murray and Trettel, Inc.; John Ciolek, AlphaTrac; Kirk Clawson, NOAA Air Resources Laboratory; Thomas Coulter, Coulter Air Quality Services; James Fairobent, U.S. Department of Energy/NNSA; Paul Fransioli, Kleinfelder; Thomas Galletta, Nuclear Regulatory Commission; Cliff Glantz, Pacific NW National Laboratory; R. Brad Harvey, U.S. Nuclear Regulatory Commission; Frank Hickey, PA Power & Light; James Holian, SAIC; Charles Hunter, Savannah River National Laboratory; John Irwin, John S. Irwin & Associates; Rachael Ishaya, BRYZA Wind Laboratory; David Katz, Climatronics Corporation; Stanton Lanham, Duke Energy; Stanley Marsh, Southern California Edison; Michael Mazaika, U.S. Nuclear

Regulatory Commission; Carl A. Mazzola, CB&I Special Services; Edward McCarthy, Pacific Gas & Electric Company; Matthew Parker, Savannah River National Laboratory; Doyle Pittman, Meteorologist (Retired); Kevin Quinlan, U.S. Nuclear Regulatory Commission; Walter Schalk, NOAA ARL/SORD; Kelly Scott, Savannah River National Laboratory; Adam Smith, Tennessee Valley Authority; Stephen Vigeant, Shaw Environmental, Ping Wan, Bechtel Power Corporation; Ken Wastrack, Tennessee Valley Authority

Status: ANSI approved a reaffirmation of this standard on 12/23/10. Co-chairs Tom Bellinger and Jen Call held several conference calls in 2013 to provide direction and help for the various writers. A shared secure workspace was set up to provide a common location for all documents and other information. Revisions from most sections of the standard were submitted throughout the year and an overall revision compiled and sent back out to the writers and reviewers for comment. Numerous comments were received and are being addressed by the co-chairs. In early 2014, the standard should be sent to the members of the Nuclear Utility Meteorological Data Users Group (NUMUG) for further input and review. Co-chair Jen Call attended the ES Consensus Committee at the Annual ANS meeting in November.

ANSI/ANS-16.1-2003; R2008, "Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-Term Test Procedure" (revision of ANSI/ANS-16.1-1986)

Scope:

This standard provides a uniform procedure to measure and index the release of radionuclides from waste forms as a result of leaching in demineralized water for 5 days. The results of this procedure do not apply to any specific environmental situation except through correlative studies of actual disposal site conditions. The test presented in this standard has much in common with the original International Atomic Energy Agency proposal and has by now become familiar to those working in the radioactive waste-form development field. It contains the provisions published in the original version of this standard in 1986.

Membership:

OPEN, Chair; Oswald Anders, DL & R Michigan Applied Science & Technology Labs; Herschel Godbee, Oak Ridge National Laboratory; Eric Sampsell, B&W Y-12

Status: A reaffirmation received ANSI approval 8/4/2008. No activity in 2013.

ANS-18.7, "Control and Monitoring of the Discharge of Chemicals" (proposed new standard under consideration)

Siting: Hydrogeologic Subcommittee

Membership:
Yan Gao, Chair, Westinghouse Electric Company
James Bollinger, Savannah River National Laboratory
Angelos Findikakis, Bechtel National Inc.
Todd Rassmussen, University of Georgia

Siting: Hydrogeologic Subcommittee manages the following projects and current standards:

ANS-2.8, "Determination of External Flood Hazards for Nuclear Facilities" (historical revision of ANSI/ANS-2.8-1992 – proposed new standard)

Scope:
This document presents criteria to establish design basis flooding for nuclear safety-related features at power reactor sites. Methodology is described to evaluate the flood having virtually no risk of exceedance that can be caused by precipitation and snowmelt and any resulting dam failures; seismically induced dam failures; surge or seiche and attendant wind-generated wave activity; or a reasonable combination of these events.

Membership:
Yan Gao, Chair, Westinghouse; Victoria Anderson, NEI; Jim August, CORE, Inc.; Kevin Bryson, Individual; Larry Cieslik, HDR; David Finnicum, Westinghouse; Rick Hill, ERIN Engineering; Quazi Hossain, Lawrence Livermore National Laboratory; Joe Hunt, B&W Technical Services Y-12; Kevin Hyde, Omaha Public Power District; Joe Kanney, U.S. Nuclear Regulatory Commission; Gregory Lowe, BWSC; Carl Mazzola, CB&I Special Services; Marty McCann, Jack R. Benjamin & Associates; Gerald Meyers, DOE; Kit Ng, Bechtel Power Corporation; Robert Rishel, Progress Energy; Ray Schneider, Westinghouse; John Stevenson, Individual (J. D. Stevenson & Associates); Vasily Titov, NOAA/Pacific National Environmental Laboratory

Status: The PINS for the historical revision was approved and submitted to ANSI on 1/16/12. The working group anticipates completing a draft in 2014 to being the multi-level approval process.

ANS-2.9, "Evaluation of Ground Water Supply for Nuclear Facilities" (historical revision of ANSI/ANS-2.9-1980; R1989 – proposed new standard)

Scope:
This standard presents guidelines for the determination of the availability of ground water supplies for nuclear power plant operations with respect to both safety and non-safety related aspects.

Membership:
James S. Bollinger, Administrative Chair, Savannah River National Laboratory; Todd Rasmussen, Technical Co-Chair, University of Georgia; Larry Armstrong, S&ME, Inc; Matt Barvenik, GZA GeoEnvironmental, Inc.; Kevin Bryson, Shaw Environmental, Inc.; Dib Goswami, Washington State Department of Ecology; Dua Guvanasen, HydroGeoLogic, Inc.; Tim Hunsucker, Duke Energy; Philip D. Meyer, Pacific Northwest National Laboratory; Fred J. Molz, III, Clemson University; Thomas J. Nicholson, U.S. Nuclear Regulatory Commission; David Scott, Radiation Safety and Control Services; Stew Taylor, Bechtel Corporation; Mike Young, University of Texas

Status: The process of developing ANS-2.9 was initiated in 2011 once companion standard ANSI/ANS-2.17-2010 was approved. Work continued on preparing of the draft in 2013.

ANS-2.13, "Evaluation of Surface-Water Supplies for Nuclear Power Sites" (historical revision of ANSI/ANS-2.13-1979; R1988 -- proposed new standard)

Scope:
From withdrawn standard: This standard presents criteria for determining: The availability of a surface water supply for plant operation with respect to both safety and nonsafety-related aspects. Water supply related effects of low flows and low levels on plant operation with respect to both safety and nonsafety-related systems.

Membership:
None

Status:
No activity. Resurrection of withdrawn standard being considered.

ANSI/ANS-2.17-2010, "Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants" (historical revision of ANSI/ANS-2.17-1980; R1989 – new standard)

Scope:
This standard 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.

Membership:
James S. Bollinger, Administrative Co-Chair, Savannah River National Laboratory; Todd Rasmussen, Technical Co-Chair, University of Georgia; Matt Barvenik, GZA GeoEnvironmental, Inc.; Rick Beauheim, Sandia National Laboratories; Mike Godfrey, Southern Nuclear; Dib Goswami, Washington State Department of Ecology; Dua Guvanasen, HydroGeoLogic, Inc.; Cyndi Martinec, Duke Energy; Philip D. Meyer, Pacific Northwest National Laboratory; Fred J. Molz, III, Clemson University; Thomas J. Nicholson, U.S. Nuclear Regulatory Commission; David Scott, Radiation

Safety and Control Services; Ed Weeks, U.S. Geological Survey; Dan Wells, Washington Savannah River Co.; Mike Young, Desert Research Institute

Status: This standard received ANSI approval on 12/23/2010. No activity in 2013.

ANS-2.18, "Standards for Evaluating Radionuclide Transport in Surface Water for Nuclear Power Sites" (proposed new standard)

Unapproved Scope:

This standard presents guidelines for the determination of the transport of radionuclides in surface water resulting from both postulate accidental and routine releases from nuclear power plants and other nuclear facilities.

Membership:

Angelos Findikakis, Chair, Bechtel; Matthew Barverik, GZA Geo Environment; Ralph Cady, Nuclear Regulatory Commission; Kit Ng, Bechtel Power Corporation, Pat Ryan, individual

Status: Additional members were added to the working group in 2012 sufficient to initiate work on the proposed new standard.

ANS-2.19, "Guidelines for Establishing Site-Related Parameters for Site Selection and Design of ISFSIs" (historical revision of ANSI/ANS-2.19-1981; R1990 -- proposed new standard)

Scope:

From withdrawn standard: This standard presents guidelines for establishing site-related parameters for site selection and design of an independent spent fuel storage installation (ISFSI). This installation provides storage of spent light water reactor (LWR) fuel that has aged a minimum of one year after discharge from the reactor core in a water basin type structure. Such an installation may be independent of both a nuclear power station and a reprocessing facility, or located adjacent to these facilities in order to share selected support systems. Aspects considered include flooding, geology, seismology, ground water, foundation engineering, earthwork engineering, and extreme wind conditions. These guidelines identify the basic site-related parameters to be considered in site evaluation, and in the design, construction, and operation of the ISFSI.

Membership:

None

Status: No activity. Resurrection of inactive project being considered.

ANS-2.32, "Guidance on the Selection and Evaluation of Remediation Methods for Subsurface" (proposed new standard)

Scope:

Draft scope from unapproved PINS: This guidance would address how to determine whether or not to remediate subsurface residual radioactivity sources within defined hydrogeologic systems at nuclear facilities both for operational and decommissioning stages. This standard would build on ANS-2.17 and provide decision criteria for evaluating when, where and how to remediate subsurface contamination at nuclear facilities in accordance with risk and performance-based considerations. Specific guidance would be provided for identifying, selecting, implementing, and monitoring the efficacy of remediation methods.

Membership:
OPEN, Chair; Sean Bushart, EPRI; Boris Faybishenko, Lawrence Berkeley National Laboratory; William E. Gunther, Brookhaven National Laboratory; Thomas Nicholson, US Nuclear Regulatory Commission; Michael Rinker, Canadian Nuclear Safety Commission

Status: The project lost its chair in mid-2012 and has struggled to find a replacement. Comments on a PINS issued to the NFSC remain unresolved. A new chair is being sought.

Siting: Seismic Subcommittee

Membership:
Quazi Hossain, Chair, Lawrence Livermore National Security
Robert Carpenter, U.S. Nuclear Regulatory Commission
Kathryn Hanson, AMEC Geomatrix
Robert Kassawara, Electric Power Research Institute
Farhang Ostadan, Bechtel Corporation
Jean Savy, Individual
Ivan Wong, URS Corporation

Siting: Seismic Subcommittee manages the following projects and current standards:

ANS-2.2, "Earthquake Instrumentation Criteria for Nuclear Power Plants" (historical revision of ANSI/ANS-2.2-2002— proposed new standard)

Scope:

This standard specifies the required earthquake instrumentation for the site and structures of light water cooled, land based nuclear power plants. It may be used for guidance at other types of nuclear facilities. This standard does not address the following: (a) Instrumentation to automatically shut down a nuclear power plant at a predetermined ground acceleration. (b) Procedures for evaluating records obtained from seismic instrumentation and instructions for the treatment of data. These procedures and instructions are specified in American National Standard, "Criteria for the Handling and Initial Evaluation of Records from Nuclear Power Plant Seismic Instrumentation," ANSI/ANS 2.10-2003.

Membership:
Farhang Ostadan, Chair, Bechtel Corp.; Jon Ake, U.S. Nuclear Regulatory Commission; Aejaz Ali, AREVA; Vladimir Graizer, U.S. Nuclear Regulatory Commission; Roy Joe Hunt, B&W Y-12; James Johnson, James Johnson & Assoc.; Roger Kenneally, Individual; Richard Lee, Los Alamos National Laboratory; Michael Lewis, Bechtel Corp.; James Marrone, Bechtel Corp.; Robert Nigbor, UCLA; Mauricio Ciudad-Real, Kinematrics, Inc.

Status: Good progress has been made on the revision. Unfortunately, the revision was not completed and approved by November 21, 2012; therefore, the current standard has been withdrawn. The revision is being done in parallel with the revision of U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.12, "Nuclear Power Plant Instrumentation for Earthquakes," Revision 2. There is collaboration between the two efforts, several of our members serve on both activities. The exchanges of information and ideas between the working group and NRC project-related personnel have benefited both efforts.

ANS-2.10, "Criteria for the Handling and Initial Evaluation of Records from Nuclear Power Plant Seismic Instrumentation" (historical revision of ANSI/ANS-2.10-2003 – proposed new standard)

Scope:

This standard provides criteria for the timely retrieval and the subsequent processing, handling, and storage of data obtained from seismic instrumentation specified in ANSI/ANS-2.2-2002. Also included are initial evaluation criteria to determine whether earthquake motion at the site has exceeded the plant's operating basis earthquake ground motion (OBE). This standard does not address procedures for plant walkdowns immediately (within 8 hours) after an earthquake, for ensuring a safe and orderly shutdown, for long-term evaluations of the building and equipment response data, and for subsequently returning the plant to operation. These topics are addressed in ANSI/ANS-2.23-2002.

Membership:
Robert Carpenter, Chair, U.S. Nuclear Regulatory Commission; Jon Ake, U.S. Nuclear Regulatory Commission; Tarek Elkhoraibi, Bechtel Power Corporation; Alidad Hashemi, Bechtel Power Corporation; Jim Johnson, James J. Johnson & Associates; Robert Kassawara, Electric Power Research Institute; Roger Kenneally, Consultant; Andrew Murphy, U.S. Nuclear Regulatory Commission; Dennis Ostrom, Consultant; John Stevenson, Individual

Status: Work continues on the revision.

ANS-2.11, "Guidelines for Evaluating Site-Related Geotechnical Parameters at Nuclear Power Sites" (historical reinvigoration of ANSI/ANS-2.11-1978; R1989 under consideration – proposed new standard)

Scope:

This standard presents guidelines for evaluating site-related geotechnical parameters for nuclear power sites. Aspects considered include geology, ground water, foundation engineering, and earthwork engineering. These guidelines identify the basic geotechnical parameters to be considered in site evaluation, and in the design, construction, and performance of foundations and earthwork

aspects for nuclear power plants. Also included are tabulations of typical field and laboratory investigative methods useful in identifying geotechnical parameters. Those areas where interrelationships with other standards may exist are indicated.

Membership:
None

Status: No activity. Withdrawn standard to be considered for reinvigoration.

ANSI/ANS-2.23-2002; R2009, "Nuclear Plant Response to an Earthquake" (new standard)
Scope:

This standard specifies actions that the owner of a nuclear power plant should take in the event of an earthquake. The requirements of this standard supplement those given in American National Standard Criteria for the Handling and Initial Evaluation of Records from Nuclear Power Plant Seismic Instrumentation, ANSI/ANS-2.10-2003. The application of these standards provides a complete evaluation of the need for post earthquake plant shutdown in a timely manner. This standard also provides guidelines that will enable the owner to develop plant-specific procedures for determining the condition of components, systems, and structures needed for shutdown and criteria for restart when a nuclear power plant is required to shut down following an earthquake. This standard does not cover those operator actions performed in connection with the operation and control of the nuclear power plant following an earthquake. These actions are specified in plant operating procedures, emergency operating procedures, and alarm response procedures.

Membership:
Robert Kassawara, Chair, Electric Power Research Institute
Balance of membership OPEN

Status: ANSI approved a reaffirmation of this standard on 6/15/09. No working group activity in 2013. Recent industry guidance has been updated and a determination will be made in 2014 whether a revision of ANSI/ANS-2.23-2002; R2009 will be needed to incorporate new data.

ANSI/ANS-2.26-2004; R2010, "Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design" (new standard)

Scope:

This standard provides: (a) criteria for selecting the seismic design category for nuclear facility structures, systems, and components (SSCs) to achieve earthquake safety and (b) criteria and guidelines for selecting Limit States for these SSCs to govern their seismic design. The Limit States are selected to ensure the desired safety performance in an earthquake.

Membership:
Quazi Hossain, Chair, Lawrence Livermore National Laboratory; Steve Additon, Rocky Flats Environmental Technology Site; Neil W. Brown, Lawrence Livermore National Laboratory; Harish Chander, US Department of Energy; Dan Guzy, U.S. Department of Energy; Asadour Hadjian, Defense Nuclear Facilities Safety Board; George B. Inch, Constellation Nuclear; Calvin Morrell,

Shaw Group, Inc.; Andrew Persinko, U.S. Nuclear Regulatory Commission; Howard C. Shaffer, Consultant; Charles M. Vaughan, Global Nuclear Fuel

Status: Received ANSI approval for a reaffirmation on 5/27/2010. No activity in 2013.

ANSI/ANS-2.27-2008, "Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments" (new standard)

Scope:

This standard provides requirements and recommended practices for conducting investigations and acquiring data sets needed to evaluate seismic source characterization for probabilistic seismic hazard analysis (PSHA), site response and soil structure interaction (SSI) effects, and liquefaction. These data also are used to evaluate fault rupture and associated secondary deformation, and other seismically-induced ground failure hazards (i.e., ground settlement, slope failure, and subsidence and collapse).

Membership:

Kathryn Hanson, Chair, AMEC-Geomatrix Consultants; Jon Ake, U.S. Nuclear Regulatory Commission; Jian-Chu Chen, Lawrence Livermore National Laboratory; Carl J. Costantino, Consultant; C. B. Crouse, URS Corporation; John Egan, AMEC-Geomatrix Consultants Inc.; Jerry King, M&O/SAIC; Richard Lee, Bechtel Savannah River Inc.; William Lettis, William Lettis & Associates, Inc.; Joe Litehiser, Bechtel Corporation; Richard McMullen, Individual; William Savage, U.S. Geological Survey; David Schwartz, U.S. Geological Survey; Paul Thenhaus, ABS Consulting Inc.

Status: This standard received ANSI approval on 7/31/2008. No activity in 2013.

ANSI/ANS-2.29-2008, "Probabilistic Seismic Hazard Analysis" (new standard)

Scope:

This standard provides criteria and guidance for performing a probabilistic seismic hazard analysis (PSHA) for the design and construction of nuclear facilities. These include but are not limited to nuclear fuel manufacturing facilities; nuclear material waste processing, storage, fabrication, and reprocessing facilities; uranium enrichment facilities; tritium production and handling facilities; radioactive material laboratories; and nuclear reactors. Criteria provided in this standard address various aspects of conducting PSHAs, including 1) selection of the process, the methodology and the level of seismic hazard analysis appropriate for a given seismic design category (SDC) structure, system, or component (SSC) or facility and the geotechnical and seismological characteristics of the site; 2) seismic source characterization; 3) ground motion estimation; 4) site response assessment; 5) assessment of aleatory and epistemic uncertainties in a PSHA; and 6) PSHA documentation requirements.

Membership:

Jean Savy, Chair, Individual; Jon Ake, U.S. Bureau of Reclamation; Kenneth Campbell, EQECAT Inc.; Nelish Chokshi, U.S. NRC; Kevin Coppersmith, Coppersmith Consulting; Carl Costantino,

Individual; C.B. Crouse, URS Corp.; Asa Hadjian, Defense Nuclear Facilities Safety Board; Quazi Hossain, LLNL; Jeffrey Kimball, U.S. DOE; Jerry King, Individual; Richard Lee, Individual; Martin McCann, JBA Associates; Maurice Power, Geomatrix Consultants; Gabriel Toro, Risk Engineering; Ivan Wong, URS Corp.; Robert Youngs, Geomatrix Consultants, Inc.

Status: This standard was approved by ANSI as a new standard on 7/31/2008. No activity in 2013.

ANS-2.30, "Assessing Capability for Surface Faulting at Nuclear Facilities" (proposed new standard

Scope:

This standard provides criteria and guidelines for investigations to assess potential for surface and near-surface faulting and associated near-fault deformation at nuclear facilities, referencing considerable new experience. The standard is an up-to-date compilation of techniques to evaluate fault offset potential and a valuable resource for planning and conducting site characterization studies for future nuclear facilities. It supplements a group of standards (i.e., ANS-2.26, -2.27, -2.29, ASCE 43-05) whose focus is on vibratory ground motion rather than fault offset hazard.

Membership:

Ivan Wong, Chair, URS Corporation; Bill Bryant, California Geological Survey; Rui Chen, California Geological Survey; Keith Kelson, URS Corporation; Jeffrey K. Kimball, Defense Nuclear Facility Safety Board; Joe Litehiser, Bechtel Corporation; Susan Olig, URS Corporation; David Schwartz, U.S. Geological Survey; Donald Wells, AMEC Environment & Infrastructure; Alice Stieve, U.S. Nuclear Regulatory Commission

Status: The working group anticipates completing the draft and releasing it to start the multi-level review and approval process in 2014. The working group believes that the title of the standard should be changed to "Criteria for Assessing the Tectonic Surface Fault Rupture and Deformation at Nuclear Facilities." The title change will be approved along with the draft once completed and issued for ballot. Once approved, this standard will supersede ANSI/ANS-2.7-1982, "Criteria and Guidelines for Assessing Capability for Surface Faulting at Nuclear Power Plants.

Environmental and Siting (ES) Consensus Committee Organizational Chart

Chair: Carl A. Mazzola Vice Chair: Yan Gao

Environmental Impact Assessment and Analysis	***Siting: Atmospheric***	***Siting: Hydrogeologic***	***Siting: Seismic***	***Siting: Ecology***	***Siting: General & Monitoring***
Kevin Bryson (Chair)	**John Stevenson (Chair)**	**Yan Gao (Chair)**	**Quazi Hossain (Chair)**	**John Downing (Chair)**	**Lisa Brandon (Chair)**
0 Current Standards	**3 Current Standards**	**1 Current Standard**	**4 Current Standards**	**0 Current Standards**	**2 Current Standards**
3 Projects	**3 Projects**	**5 Projects**	**4 Projects**	**6 Projects**	**3 Projects**
18.2.1-(NEW) Methods for Inferring Environmental Doses	2.3-2011 Estimating Tornado, Hurricane, and Extreme Straight Line Wind Characteristics at Nuclear Facility Sites Approved 4/22/2011	2.8-(W2002) Determination of External Flood Hazards for Nuclear Facilities	2.2-(W2012) Earthquake Instrumentation Criteria for Nuclear Power Plants	2.25-(W1999) Surveys of Terrestrial Ecology Needed to License Thermal Power Plants	2.6-(NEW) Guidelines for Estimating Present & Forecasting Future Population Distributions Surrounding Power Reactor Sites
18.8-(NEW) Guidelines for Environmental and Economic Analysis of the Regional Effects of Power Facilities	2.15-2013 Criteria for Modeling and Calculating Atmospheric Dispersion of Routine Radiological Releases from Nuclear Facilities Approved 2/27/2013	2.9-(W2000) Evaluation of Ground Water Supply for Nuclear Facilities	2.10-(W2013) Criteria for the Handling and Initial Evaluation of Records from Nuclear Power Plant Seismic Instrumentation	18.3.1-(NEW) Entrainment: Guide to Steam Electric Power Plant Cooling System Siting, Design and Operation for Controlling Damage to Aquatic Organisms	2.22-(NEW) Environmental Radiological Monitoring at Nuclear Facilities
18.9-(NEW) Environmental Impact Evaluation	2.16-(NEW) Criteria for Modeling Design-Basis Accidental Releases From Nuclear Facilities	2.13-(W1998) Evaluation of Surface-Water Supplies for Nuclear Power Sites	2.11-(W1999) Guidelines for Evaluating Site-Related Geotechnical Parameters at Nuclear Power Sites	18.3.2-(NEW) Cold Shock: Guide to Steam Electric Power Plant Cooling System Siting, Design and Operation for Controlling Damage to Aquatic Organisms	3.11-2005;R2010 Determining Meteorological Information at Nuclear Facility Sites RF 12/23/2010
	2.21-2012 Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink Approved 6/5/2012	2.17-2010 Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants Approved 12/23/2010	2.23-2002 (R2009) Nuclear Plant Response to an Earthquake RF 6/15/2009	18.3.3-(NEW) Entrapment/Impingement: Guide to Steam Electric Power Plant Cooling System Siting, Design and Operation for Controlling Damage to Aquatic Organisms at Water Intake Structures	16.1-2003;R2008 Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-Term Test Procedure RF 8/4/2008
	2.31-(NEW) Estimating Extreme Precipitation at Nuclear Facility Sites	2.18-(NEW) Standards for Evaluating Radionuclide Transport in Surface Water for Nuclear Power Sites	2.26-2004 (R2010) Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design RF 5/27/2010	18.4-(NEW) Aquatic Ecological Surveys Required for Siting, Design, and Operation of Thermal Power Plants	18.7-(NEW) Control and Monitoring of the Discharge of Chemicals
	3.8.10-(NEW) Criteria for Modeling Real-Time Accidental Release Consequences at Nuclear Facilities	2.19-(W1999) Guidelines for Establishing Site-Related Parameters for Site Selection and Design of ISFSIs (Water Pool Type)	2.27-2008 Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments Approved 7/31/2008	18.6-(NEW) Discharge of Thermal Effluents into Surface Waters	
			2.29-2008 Probabilistic Seismic Hazard Analysis Approved 7/31/2008		
			2.30-(NEW) Criteria for Assessing Tectonic Surface Fault Rupture and Deformation at Nuclear Facilities		

Table 2 – ES Organizational Chart

Fuel, Waste, and Decommissioning (FWD) Consensus Committee

Donald R. Eggett, Chair
Automated Engineering Services Corporation

Scope:

The FWD Consensus Committee is responsible for the preparation and maintenance of voluntary consensus standards for the design, operation, maintenance, operator selection and training, quality requirements of new and used fuel transport, storage and related handling facilities; including high level/TRU, greater-than-Class C, low level, and mixed waste processing and facilities, and for the decommissioning of commercial, educational, research and government facilities. The ANS Standards Committee Procedures Manual for Consensus Committees shall be used to guide the activities of this consensus committee.

The FWD Consensus Committee supervises the work of the following three subcommittees:

New and Used Fuel (Design Only)
High Level GTCC, Low Level and Mixed Waste
Decommissioning (Commercial and Research Facilities)

Each subcommittee has established various working groups to develop specific proposed standards and maintain existing standards within its respective area of responsibility. These working groups create the text of FWD standards and resolve review and ballot comments.

FWD Membership:

Donald R. Eggett, Chair, Automated Engineering Services Corporation
Sheila A. Lott, Vice Chair, Los Alamos National Laboratory
Timothy Ake, AREVA Federal Services, LLC
Sven O. Bader, AREVA Federal Services, LLC
Jeffery R. Brault, CB&I Power
Anoop Kota, NAC International
Donald Lewis, Shaw Power Group
Coleman C. Miller, Pacific Gas & Electric Company
Mitchell Sanders, Westinghouse Electric Company
Steven W. Schlithelm, B&W mPower, Inc.
Donald J. Spellman, Oak Ridge National Laboratory
Maryanne Stasko, Duke Energy

Report of FWD:
The FWD held its inaugural meeting on November 11, 2013, during the ANS Winter Meeting in Washington D.C.

Approved in 2013:
No FWD standards were reaffirmed or approved by ANSI in 2013.

Active Standards/Projects:
ANS-55.1, "Solid Radioactive Waste Processing System for Light-Water-Cooled Reactor Plants" (revision of ANSI/ANS-55.1-1992; R2009)

ANS-55.4, "Gaseous Radioactive Waste Processing Systems for Light Water Reactor Plants" (revision of ANSI/ANS-55.4-1993; R2007)

ANS-55.6, "Liquid Radioactive Waste Processing System for Light Water Reactor Plants" (RF (revision of ANSI/ANS-55.6-1993; R2007)

ANS-57.2, "Design Requirements for Light Water Reactor Spent Fuel Facilities at Nuclear Power Plants" (historical revision of ANSI/ANS-57.2-1983 – proposed new standard)

ANS-57.3, "Design Requirements for New Fuel Storage Facilities at LWR Plants" (historical revision of ANSI/ANS-57.3-1983 – proposed new standard)

New and Used Fuel (Design Only) Subcommittee

Membership:
OPEN, Chair
Mark Peres, Fluor Enterprises, Inc.

New and Used Fuel (Design Only) Subcommittee manages the following projects and standards:

ANSI/ANS-57.1-1992; R1998; R2005, "Design Requirements for Light Water Reactor Fuel Handling Systems" (revision of ANSI/ANS-57.1-1980)

Scope:

This standard sets forth the required functions of fuel handling systems at light water reactor nuclear power plants. It provides minimum design requirements for equipment and tools to handle nuclear fuel and control components safely.

Membership:
OPEN

Status: Reaffirmation received ANSI approval 7/20/2005. No activity in 2013.

ANS-57.2, "Design Requirements for Light Water Reactor Spent Fuel Facilities at Nuclear Power Plants" (historical revision of ANSI/ANS-57.2-1983 – proposed new standard)

Scope:

This standard defines design requirements for spent fuel pool storage and handling facilities at nuclear power plants for pool storage and preparation for shipment of spent fuel from light-water reactor nuclear power stations. It contains requirements for the design of: Fuel storage pool; Fuel storage racks; Pool makeup, instrumentation / cleanup systems; Pool structure / integrity; Radiation shielding; Residual heat removal; Ventilation, filtration and radiation monitoring systems; Shipping cask handling and decontamination; Building structure and integrity; Fire protection and communication.

Membership:
Mark Peres, Chair, Fluor Nuclear Power; Donald (Wayne) Lewis, Vice Chair, Shaw Power Group; Michael Akins, Worley Parsons (semi-retired); Gordon Bjorkman, Nuclear Regulatory Commission; Richard Browder, Duke Energy; Matt Eyre, NETCO; Brian Gutherman, Gutherman Technical Services; Nathan Hottle, Areva; Dale Lancaster, Nuclear Consultants; Christian Lobscheid, NuScale Power; John Massey, California Maritime Academy (retired); Mitchell Sanders, Westinghouse; Maryanne Stasko, Duke Energy; Tim Ake, Areva; Robert Tucker, Bechtel

Status: Because of their closely related scope, both the ANS-57.2 and ANS-57.3 standards are being developed jointly. In 2013, the working group reviewed and revised the initial draft. Questions are being investigated and addressed related to inclusion of beyond design basis accidents, risk-informed performance-based principles, and results of recent studies that have been completed related to spent fuel storage risks.

ANS-57.3, "Design Requirements for New Fuel Storage Facilities at LWR Plants" (historical revision of ANSI/ANS-57.3-1983 – proposed new standard)

Scope:
This standard defines the required functions of dry storage facilities for new fuel at light water reactor nuclear power plants. It provides minimum design requirements for safe, dry storage of new nuclear fuel and control components at such plants. The fuel storage facilities covered by this standard are used for receiving, inspecting and dry storage of new fuel containing uranium oxide and mixed oxides. The basis of this standard is to ensure the design of the facility will be performed in an efficient and economical manner to (a) preclude criticality, (b) ensure protection to new fuel assemblies, control components, plant personnel, and the public, and (c) maintain radiation exposures as low as reasonably achievable. This standard does not address dry cask storage or transportation of nuclear fuel.

Membership:
Mark Peres, Chair, Fluor Nuclear Power; Brian Gutherman, Vice Chair, Gutherman Technical Services; Michael Akins, Worley Parsons (semi-retired); Gordon Bjorkman, Nuclear Regulatory Commission; Richard Browder, Duke Energy; Matt Eyre, NETCO; Nathan Hottle, Areva; Dale Lancaster, Nuclear Consultants; Donald (Wayne) Lewis, Shaw Power Group; Christian Lobscheid, NuScale Power; John Massey, Ph.D., California Maritime Academy (retired); Marcus Nichol, Nuclear Energy Institute; Mitchell Sanders, Westinghouse; Maryanne Stasko, Duke Energy; Tim Ake, Areva; Robert Tucker, Bechtel

Status: Because of their closely related scope, both the ANS-57.2 and ANS-57.3 standards are being developed jointly. In 2013, the working group reviewed and revised the initial draft. Questions are being investigated and addressed related to inclusion of beyond design basis accidents, risk-informed performance-based principles, and results of recent studies that have been completed related to spent fuel storage risks.

ANSI/ANS-57.5-1996; R2006, "Light Water Reactors Fuel Assembly Mechanical Design and Evaluation" (revision of ANSI/ANS-57.5-1981)

Scope:

This standard sets forth a series of design conditions and functional requirements for the design of fuel assemblies for light water cooled commercial power reactors. It includes specific requirements for design, as well as design criteria to ensure adequate fuel assembly performance. The standard establishes a procedure for performing an evaluation of the mechanical design of fuel assemblies. It does not address the various aspects of neutronic or thermal-hydraulic performance except where these factors impose loads or constraints on the mechanical design of the fuel assemblies.

Status: Reaffirmed by ANSI on 2/28/2006. No activity in 2013.

ANSI/ANS-57.8-1995 (R2011), "Fuel Assembly Identification" (revision of ANSI/ANS-57.8-1978; R1987)

Scope:

This standard describes requirements for the unique identification of fuel assemblies utilized in nuclear power plants. It defines the characters and proposed sequence to be used in assigning identification to fuel assemblies. This standard was developed primarily for commercial light-water reactor fuel, but may be used for any reactor fuel contained in discrete fuel assemblies that can be identified with a serial number as specified by this standard. Additionally, this standard describes requirements for a matrix system for identification in mapping the location of fuel rods within a fuel assembly. The matrix system establishes unique x-y coordinates for each possible rod location.

Status: Reaffirmed by ANSI on 8/26/2011. No activity in 2013.

ANSI/ANS-57.10-1996; R2006, "Design Criteria for Consolidation of LWR Spent Fuel" (revision of ANSI/ANS-57.10-1987)

Scope:

This standard provides design criteria for the process of consolidating LWR spent nuclear fuel in either a wet or a dry environment. It addresses processes for consolidating fuel either horizontally or vertically. The standard sets forth requirements for utilizing equipment and systems to perform consolidation, handle fuel rods and nonfuel-bearing components, and handle broken fuel rods. This standard also contains requirements for facility or installation interfaces, nuclear safety, structural design, thermal design, accountability, safeguards, decommissioning, and quality assurance. The standard is not concerned with the storage of the spent fuel either before or after the consolidation process. These areas are covered in the following American National Standards: Design Requirements for Light Water Reactor Spent Fuel Facilities at Nuclear Power Plants, ANSI/ANS-57.2-1992. Design Criteria for an Independent Spent Fuel Storage Installation (Water Pool Type), ANSI/ANS-57.7-1992. Design Criteria for an Independent Spent Fuel Storage Installation (Dry Storage Type), ANSI/ANS-57.9-1992.

Status: Reaffirmed by ANSI on 7/6/2006. No activity in 2013.

High Level, GTCC, Low Level and Mixed Waste Subcommittee

Membership:
OPEN, Chair
D. Mark Gerboth, Energy Solutions
Coleman Miller, Pacific Gas & Electric Company
Craig Schmiesing, AREVA Inc.

High Level, GTCC, Low Level and Mixed Waste Subcommittee manages the following projects and standards:

ANS-15.19, "Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor" (withdrawn standard being considered for reinvigoration)

Scope:

This standard provides the necessary information for the shipping, receiving, and storing of fuel and other fabricated special nuclear material for research reactors. The areas addressed are data collection and analysis, packaging selection, preparation of the package or shipment, or both, safeguards, internal material control, records, and quality assurance for shipping.

Status: No activity. Withdrawn standard to be considered for reinvigoration.

ANS-40.21, "Siting, Construction, and Operation of Commercial Low Level Radioactive Waste Burial Grounds" (withdrawn project being considered for resurrection)

Scope:

Unapproved scope from draft PINS: This standard provides a matrix of minimum criteria to be met in determining the siting, construction and operation of a commercial low level radioactive waste burial ground. The standard will balance siting (i.e., natural criteria), construction (i.e., engineered safeguards) and operation (i.e., acceptance criteria) to provide a safety matrix that provides for the containment of the facility.

Status: No activity. Withdrawn project to be considered for reinvigoration.

ANS-40.35, "Volume Reduction of Low-Level Radioactive Waste or Mixed Waste" (historical revision of ANSI/ANS-40.35-1991– proposed new standard)

***Old Scope*:**

This standard sets forth the general design specifications, procurement, and performance requirements for operation of low-level waste (LLW) and mixed waste (MW) volume reduction (VR) processing systems for nuclear power plants and other nuclear facilities. This standard may be applied to the specification of other LLW VR systems (such as government nuclear facilities) if consideration is given to any additional design features required by the hazardous nature of the

wastes to be processed by them. For the purpose of this standard, a nuclear facility's LLW VR processing systems begin at the point where treatment of aqueous waste generates a solid waste, or where solid, slurry, or liquid organics wastes are collected, and ends at a waste storage, shipping, or disposal area. VR techniques may include processes such as drying, incineration, chemical decomposition, flash boiling, mechanical, or high-temperature reduction or destruction techniques, or both. Some VR systems may include, as an integral part of the system, a means for immobilization of the waste. Compaction and solidification techniques are in the scope of American National Standard Solid Radioactive Waste Processing Systems for Light Water Reactor Plants, ANSI/ANS-55.1-1992.

Membership:
Mark Gerboth, Chair, Energy Solutions; Mike Akins, Parsons E&C; Kevin Browne; Mark Kirshe; Allan Leviton

Status: No activity reported.

ANSI/ANS-40.37-2009 "Mobile Low-Level Radioactive Waste Processing Systems" (historical revision of ANSI/ANS-40.37-1993 – new standard)

Scope:
This standard sets forth design, fabrication, and performance recommendations and requirements for mobile low-level radioactive waste processing (MRWP) systems (including components) for nuclear facilities that generate low-level radioactive wastes (LLWs) as defined by the Atomic Energy Act as amended. The purpose of this standard is to provide guidance to ensure that the MRWP systems are designed, fabricated, installed, and operated in a manner commensurate with the need to protect the health and safety of the public and plant personnel.

Membership:
Clint Miller, Chair, Pacific Gas & Electric Company; Paul Saunders, Suncoast Solutions, Inc.; David Vaught, Duke Energy

Status: This standard received ANSI approval as an American National Standard on 11/20/09. No activity in 2013. The standard will be reviewed in 2014 to determine if it should be reaffirmed or revised.

ANSI/ANS-55.1-1992; R2009, "Solid Radioactive Waste Processing System for Light Water Cooled Reactor Plants" (revision of ANSI/ANS-55.1-1979)

***Scope*:**
This standard sets forth the design, construction, and performance requirements for a solid radioactive waste processing system for light water cooled reactor plants. For the purposes of this standard, the solid radioactive waste system begins at the interface with the liquid radioactive waste processing system boundary and at the inlets to the spent resin, filter sludge, evaporator concentrate, and phase separator tanks. In addition, this standard pertains to dry active waste, mixed waste, and other solid radioactive waste forms that are generated as part of the operation and maintenance of light water cooled reactor plants. The system includes facilities for temporary (up to 30 days of anticipated normal waste generation) on-site storage of packaged waste but terminates at the point of loading the filled drums and other containers on a vehicle for shipping off-site to a licensed disposal site or transfer to interim (up to 5 yr) on-site storage facilities. The solid radioactive waste processing system is not a safety-class system as defined by American National Standard Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants,

ANSI/ANS-51.1-1983 (R1988) or as defined in American National Standard Nuclear Safety Criteria for the Design of Stationary Boiling Water Reactor Plants, ANSI/ ANS-52.1-1983 (R1988).

Membership:
Craig Schmiesing, Chair, AREVA Inc.; Edgar Degiovanni, Southern California Edison; Clint Miller, Pacific Gas & Electric; Dick Snell, Snell Consulting; David Vaught, Duke Power; Michael Walsh, Jacobs Engineering; Chang-Yang Li, U.S. NRC

Status: Craig Schmiesing took over chairmanship late summer 2013. New members are being sought. Pre-planning for a meeting is underway.

ANSI/ANS-55.4-1993; R2007, "Gaseous Radioactive Waste Processing System for Light Water Cooled Reactor Plants" (revision of ANSI/ANS-55.4-1979)

***Scope*:**
This standard sets forth minimum design, construction, and performance requirements, with due consideration for operation, for gaseous radioactive waste processing systems (GRWPS) for light water reactor (LWR) plants. It is applicable for routine operation, design basis fuel leakage, and other design basis occurrences.

Membership:
Craig Schmiesing, Chair, AREVA Inc.; Edgar Degiovanni, Southern California Edison; Clint Miller, Pacific Gas & Electric; Dick Snell, Snell Consulting; David Vaught, Duke Power; Michael Walsh, Jacobs Engineering; Chang-Yang Li, U.S. NRC

Status: Craig Schmiesing took over chairmanship late summer 2013. New members are being sought. Pre-planning for a meeting is underway.

ANSI/ANS-55.6-1993; R1999; R2007, "Liquid Radioactive Waste Processing System for Light Water Reactor Plants" (revision of ANSI/ANS-55.6-1979)

Scope:
This standard sets forth minimum design, construction, and performance requirements, with due consideration for operation, of the Liquid Radioactive Waste Processing System (LRWPS) for light water reactor (LWR) plants for design basis inputs. It is applicable to routine operation, including design basis fuel leakage and other design basis occurrences.

Membership:
Craig Schmiesing, Chair, AREVA Inc.; Edgar Degiovanni, Southern California Edison; Clint Miller, Pacific Gas & Electric; Dick Snell, Snell Consulting; David Vaught, Duke Power; Michael Walsh, Jacobs Engineering; Chang-Yang Li, U.S. NRC

Status: Craig Schmiesing took over chairmanship late summer 2013. New members are being sought. Pre-planning for a meeting is underway.

Decommissioning (Commercial and Research Facilities) Subcommittee

Membership:
OPEN, Chair
Decommissioning (Commercial and Research Facilities) Subcommittee manages the following standard:

ANS-15.10, "Decommissioning of Research Reactors" (proposed reinvigoration of withdrawn standard under consideration)

Scope:

This standard provides requirements and criteria for the decommissioning of research reactors and includes decommissioning alternatives, planning, radiation criteria, surveillance and maintenance, environmental impacts, quality assurance, and reports and documentation.

Status: No activity. Reinvigoration of historical standard being considered.

Fuel, Waste, and Decommissioning (FWD) Consensus Committee Organizational Chart

Chair: Donald R. Eggett Vice Chair: Sheila A. Lott

New and Used Fuel (Design Only)	*High Level, GTCC, Low Level, and Mixed Waste*	*Decommissioning (Commercial and Research Facilities)*
Chair (TBD) **Vice-Chair (TBD)**	**Chair (TBD)** **Vice-Chair (TBD)**	**Chair (TBD)** **Vice-Chair (TBD)**
4 Current Standards	**4 Current Standards**	**0 Current Standards**
2 Projects	**3 Projects**	**1 Project**
ANS-57.1-1992 (R2005) Design Requirements for Light Water Reactor Fuel Handling Systems RF 7/20/2005	ANS-15.19 Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor (WITHDRAWN 2001; RV being considered)	ANS-15.10 Decommissioning of Research Reactors (WITHDRAWN in 2004; RV being considered)
ANS-57.2 Design Requirements for Light Water Reactor Spent Fuel Facilities at Nuclear Power Plants (WITHDRAWN 1993; RV in Development)	ANS-40.21 Siting, Construction, and Operation of Commercial Low Level Radioactive Waste Burial Grounds (inactive project in consideration for resurrection)	
ANS-57.3 Design Requirements for New Fuel Storage Facilities at LWR Plants (WITHDRAWN 1993; RV in Development)	ANS-40.35 Volume Reduction of Low-Level Radioactive Waste or Mixed Waste (WITHDRAWN 2001; RV in Development)	
ANS-57.5-1996 (R2006) Light Water Reactors Fuel Assembly Mechanical Design and Evaluation RF 2/28/2006	ANS-40.37-2009 Mobile Low-Level Radioactive Waste Processing Systems App'd 11/20/2009	
ANS-57.8-1995 (R2011) Fuel Assembly Identification RF 8/26/2011	ANS-55.1-1992 (R2009) Solid Radioactive Waste Processing System for Light-Water-Cooled Reactor Plants RF 6/15/2009	
ANS-57.10-1996 (R2006) Design Criteria for Consolidation of LWR Spent Fuel RF 7/6/2006	ANS-55.4-1993 (R2007) Gaseous Radioactive Waste Processing Systems for Light Water Reactor Plants RF 5/14/2007	
	ANS-55.6-1993 (R2007) Liquid Radioactive Waste Processing System for Light Water Reactor Plants RF 5/14/2007	

Table 3 – FWD Organizational Chart

Large Light Water Reactor Consensus Committee (LLWR)

William Reuland, Chair
Individual

Scope:

The LLWR Consensus Committee is responsible for the preparation and maintenance of voluntary consensus standards for the design, operation, maintenance, operator selection and training, and quality requirements for current operating nuclear power plants and future nuclear power plants that employ large station light water moderated, water-cooled reactors. The standards include the reactor island, balance of plant, and other systems within the plant boundary that affect safety and operations. The ANS Standards Committee Procedures Manual for Consensus Committees shall be used to guide the activities of this consensus committee.

The LLWR Consensus Committee supervises the work of the following subcommittees:

Large Light Water Reactor & Reactor Auxiliary Systems Design
Power Generation & Plant Support
Simulators, Instrumentation, Control Systems, Software & Testing
Emergency Planning & Response

Each subcommittee has established various working groups to develop specific proposed standards and maintain existing standards within its respective area of responsibility. These working groups create the text of LLWR standards and resolve review and ballot comments.

LLWR Membership:

William Reuland, Chair, Individual
Timothy K. Meneely, Vice Chair, Westinghouse Electric Company, LLC
William H. Bell, South Carolina Electric & Gas Company
Charles K. Brown, Southern Nuclear Operating Company
James B. Florence, Nebraska Public Power District
Darrell Gardner, Generation mPower, LLC
Steven W. Gebers, Quantum Nuclear Services
James P. Glover, Graftel, Inc.
Pranab K. Guha, U.S. Department of Energy
Earnestine Johnson-Turnipseed, Bechtel Corporation
Leroy E. Kreider, Engineering Planning & Management, Inc.
Mark A. Linn, Oak Ridge National Laboratory
Evan E.M. Lloyd, Exitech Corporation
Eric P. Loewen, GE Hitachi Nuclear Energy
Ronald Markovich, Contingency Management Consultant
Herbert W. Massie, Jr., Defense Nuclear Facilities Safety Board
Robert H. McFetridge, Westinghouse Electric Company, LLC
Charles H. Moseley, Jr., Individual
Dennis Newton, AREVA
R. Michael Ruby, Nuclear Consultant
James C. Saldarini, Bechtel Power Corporation
Steven L. Stamm, Individual

LLWR Liaisons:
James H. Riley, Nuclear Energy Institute
Donald J. Spellman, IEEE/NPEC Liaison

Alternates:
John C. Butler (Alternate for J. Riley), Nuclear Energy Institute
Robert S. Fournier (Alternate for R. McFetridge), Westinghouse Electric Company, LLC

Report of LLWR:
The LLWR held its inaugural meeting on November 13, 2013, during the ANS Winter Meeting in Washington D.C.

Approved in 2013:
ANSI/ANS-3.4-2013, "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants" (Supersedes ANS-3.4-1996; R2002)

Active Standards/Projects:
ANS-3.1 "Selection, Qualification, and Training of Personnel for Nuclear Power Plants" (historical revision of ANSI/ANS-3.1-1993; R1999 – proposed new standard)

ANS-3.5, "Nuclear Power Plant Simulators for Use in Operator Training and Examination" (revision of ANSI/ANS-3.5-2009)

ANS-3.8.7, "Properties of Planning, Development, Conduct, and Evaluation of Drills and Exercises for Emergency Preparedness at Nuclear Facilities" (historical revision of ANSI/ANS-3.8.7-1998 – proposed new standard)

ANS-3.13, "Nuclear Facility Reliability Assurance Program (RAP) Development" (proposed new standard)

ANS-18.1, "Radioactive Source Term for Normal Operation of Light Water Reactors" (historical revision of ANSI/ANS-18.1-1999 – proposed new standard)

ANS-50.1, "Nuclear Safety Criteria for the Design of Stationary Light Water Reactor Plants" (proposed new standard)

ANS-51.10, "Auxiliary Feedwater System for Pressurized Water Reactors" (revision of ANSI/ANS-51.10-1991; R2008)

ANS-56.8, "Containment System Leakage Testing Requirements" (revision of ANSI/ANS-56.8-2002; R2011)

ANS-58.6, "Criteria for Remote Shutdown for Light Water Reactors Facilities" (historical revision of ANSI/ANS-58.6-1996; R20010 – proposed new standard)

ANS-58.8-1994 (R2008), "Time Response Design Criteria for Safety-Related Operator Actions" (revision of ANSI/ANS-58.8-1994; R2001; R2008)

Large Light Water Reactor and Reactor Auxiliary Systems Design Subcommittee

Membership:
Dennis Newton, Chair, AREVA
William Bell, Vice Chair, South Carolina Electric & Gas Company
Sam Bradley, Westinghouse Electric Company, LLC
Earnestine Johnson-Turnipseed, Bechtel Corporation
Leroy (Rocky) Krieder, Engineering, Planning & Management, Inc.
Mark Linn, Oak Ridge National Laboratory
James Sejvar, Westinghouse Electric Company, LLC

Subcommittee - Large Light Water Reactor & Reactor Auxiliary Systems Design manages the following projects and current standards:

ANS-18.1, "Radioactive Source Term for Normal Operation of Light Water Reactors" (historical revision of ANSI/ANS-18.1-1999 – proposed new standard)

Scope:

This standard provides a set of typical radionuclide concentrations for estimating the radioactivity in the principal fluid systems of light water reactors and for projecting the expected releases of radioactivity from nuclear plants. It is not Intended that the values be used as the sole basis for design, but be used in environmental reports and elsewhere where expected operating conditions over the life of the plant would be appropriate.

Membership:
William Bell (Chair), South Carolina Electric and Gas; Justin Byard, AREVA; Olga A. Correal-Pulver, Westinghouse Electric Company Nuclear Fuels; Germina Ilas, Oak Ridge National Laboratory; David Perkins, EPRI; Mark Rutherford, AREVA; James Sejvar, Individual; Pavel V. Tsvetkov, Texas A&M University

Status: Efforts continued to find activity measurements from operating plants to provide the basis for data updates are needed to proceed with the revision of this standard.

ANS-50.1, "Nuclear Safety Criteria for the Design of Light Water Reactor Plants" (proposed new standard)

Scope:

This standard is process based and provides the criteria and bases for developing system, structure, and component design criteria, functional design requirements, and equipment safety classification for stationary light water reactors nuclear power plants through the application of both deterministic and risk-informed methods. Operation, maintenance, and testing requirements for the plant design will meet system functional requirements in accordance with industry regulations. Individual design requirements will be provided in supporting standards.

Membership:
Mark Linn, Chair, ORNL; David Blanchard, Applied Reliability Engineering; Milton Capiotis, Worley Parsons; James Chapman, Scientech, Curtis Wright Flow Control; Gary Corpora, Westinghouse; John Garibaldi, URS Energy and Construction, Inc.; David Johnson, ABS; Paul Sicard, Entergy; Christina Soderholm, Fortum; Russell Williston, Individual

Status: A PINS has been approved and submitted to ANSI on 4/5/2012. The working group is currently preparing the initial draft of the standard.

ANSI/ANS-51.10-1998; R2009, "Auxiliary Feedwater System for Pressurized Water Reactors" (revision of ANSI/ANS-51.10-1979)

Scope:
This standard is applicable to pressurized light water reactor nuclear power plants using auxiliary feedwater for emergency applications. Small modular plants are not considered in the scope of this document.

This standard sets forth the nuclear safety-related functional requirements, performance requirements, design criteria, design requirements for testing and maintenance, and interfaces for the nuclear safety-related portion of the auxiliary feedwater system (AFS) of pressurized water reactor (PWR) plants.

Membership:
Earnestine Johnson-Turnipseed, Chair, Bechtel Power Corporation; Richard Hill, Erin Engineering; Stanley Gardocki, U.S. Nuclear Regulatory Commission; Tasnima Matin, U.S. Patent Office; Collaboration by Osuke Imai, Mitsubishi Nuclear Energy Systems, Inc.

Status: The draft was issued for a preliminary review to its subcommittee; comments are in resolution.

ANS-58.6, "Criteria for Remote Shutdown for Light Water Reactors Facilities" (historical revision of ANSI/ANS-58.6-1996; R2001 – proposed new standard)

Scope:
This standard provides design criteria for controls and monitoring instrumentation necessary to shut down a reactor and maintain it in a safe shutdown condition from outside the control room. The design criteria require that: (a) specific controls and monitoring instrumentation be provided; (b) these controls be installed at a location (or locations) that is physically separate from the control room and cable spreading areas; (c) simultaneous control from both locations be prevented by devices for transfer of control from the control room to the remote location(s); and (d) the remote controls be used as a defense-in-depth measure in addition to the control room shutdown controls and as a minimum provide for one complete channel of shutdown equipment.

Membership:
Sam Bradley, Chair
Balance of the committee OPEN

Status: No activity. Subject matter experts are needed to determine necessity for historical revision.

ANSI/ANS-58.9-2002; R2009, "Single Failure Criteria for Light Water Reactor Safety-Related Fluid Systems" (re-approval of ANSI/ANS-58.9-1981; R1987 -- new standard)

Scope:

This standard provides criteria for the designer which interpret the requirements of Title 10, Code of Federal Regulations, Part 50, "Licensing of Production and Utilization Facilities," Appendix A, "General Design Criteria for Nuclear Power Plants," with respect to design against single failures in safety-related Light Water Reactor (LWR) fluid systems. Means of treating both active and passive failures are addressed for safety-related fluid systems following various initiating events. Current acceptable practice is used as a basis for these criteria.

Failure criteria for the electric power systems and the protection systems are provided in IEEE Std 308-1980 "IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations", IEEE Std 279-1971 "IEEE Standard Criteria for Protection Systems for Nuclear Power Generating Stations" (N42.7-1972), IEEE Std 379-1977 "IEEE Standard for Application of the Single-Failure Criterion to Nuclear Power Generating Station Class IE Systems", and IEEE Std 603-1980 "Standard Criteria for Safety Systems for Nuclear Power Generating Stations." Failures of structural components, such as braces, supports, or restraints, as well as occurrences involving common mode failures, are excluded.

Membership:

Leroy E. Kreider, Chair, Engineering Planning and Management, Inc.; Robert Burg, Engineering Planning and Management, Inc.; Prasad Kadambi, U.S. Nuclear Regulatory Commission

Status: Reaffirmation approved by ANSI 2/24/2009. No activity in 2013.

ANS-58.11, "Design Criteria for Safe Shutdown Following Selected Design Basis Events in Light Water Reactors" (historical revision of ANSI/ANS-58.11-1995; R2003 – proposed new standard)

Scope:

This standard provides design criteria for systems that perform the safety-related functions necessary to shut down a reactor and maintain it in a safe shutdown condition for selected design basis events; i.e., any design basis events that do not require operation of engineered safety features. For design basis events that require operation of engineered safety features, this standard can be selectively applied because of plant features specifically designed for these conditions. For systems that serve multiple functions, the design criteria associated with the most limiting function shall be applied.

The following safety-related functions are required for safe shutdown and are addressed in this standard:

(1) Reactor core reactivity control
(2) Reactor core heat removal
(3) Reactor coolant pressure boundary integrity provided by:
(a) Temperature control
(b) Pressure control, and
(c) Inventory control.

Membership:
OPEN

Status: The standard was administratively withdrawn by ANSI on 7/23/2012 for lack of maintenance. Without an active working group and subject matter experts to review the standard, concern was expressed that an appropriate analysis of the standard was not possible and therefore was not a candidate for review. A new working group chair and members are needed to update the standard.

ANSI/ANS-58.14-2011, "Safety and Pressure Integrity Classification Criteria for Light Water Reactors" (historical revision of ANSI/ANS-58.14-1993 – new standard)

Scope:
This standard specifies deterministic criteria for the safety classification of items (SSCs and parts, including consumables) in a light water reactor (LWR) nuclear power plant as either safety-related (Q), non-safety-related (N), or supplemented (S). In addition, pressure integrity classification criteria are provide for the assignment of Classes 1 to 5 to the pressure-retaining portions of items.

Membership:
Mark Linn, Chair, ORNL; David Blanchard, Applied Reliability Engineering; Sara Highley, AREVA NP; Rick Hill, ERIN; Gary Locklear, Individual; Paul Sicard, Entergy; Russell Williston, Xcel Energy

Status: This standard received ANSI approval on 4/22/2011. No activity needed.

Power Generation and Plant Support Systems Subcommittee

Membership:
Leroy (Rocky) Krieder, Chair, Engineering Planning & Management, Inc.
James Saldarini, Co-chair, Bechtel Power Corporation

Power Generation & Plant Support Systems Subcommittee manages the following projects and current standards:

ANS-56.1, "Containment Hydrogen Control" (proposed standard to be considered)

ANS-58.2, "Design Basis for Protection of Light Water Nuclear Power Plants Against the Effects of Postulated Pipe Rupture" (historical revision of ANSI/ANS-58.2-1988; W1998 – new standard)

Scope:

This standard addresses the design basis for the protection of light water reactor nuclear power plants from the potentially adverse effects of postulated pipe ruptures.

Membership:
OPEN

Status: There was no activity to report in 2013.

ANSI/ANS-58.3-1992; R1998; R2008, "Physical Protection for Nuclear Safety-Related Systems and Components" (revision of ANSI/ANS-58.3-1977)

Scope:

This standard sets forth physical protection criteria for nuclear safety-related systems and components in stations using light water reactors (LWRs). This standard includes an identification of potential hazards to nuclear safety-related systems and components and acceptable means of ensuring the protection of this equipment from these hazards.

Membership:
OPEN

Status: Reaffirmation received ANSI approval 3/18/08. No activity in 2013.

ANS-59.3, "Nuclear Safety Criteria for Control Air Systems" (historical revision of ANSI/ANS-59.3-1992; R2002 -- proposed new standard)

Scope:

This standard provides criteria for the control air system that furnishes compressed air to nuclear safety-related components and other equipment that could affect any nuclear safety-related function in nuclear power plants.

This standard provides: (1) the system nuclear safety design requirements and the non-nuclear safety design recommendations for equipment, piping, instruments, and controls that constitute the control air system; and (2) the nuclear safety design requirements and the non-nuclear safety design recommendations to accommodate the testing and maintenance necessary to ensure adequate performance of the control air system.

This standard applies only to the control air system and does not apply to air-operated devices or the emergency diesel generator starting air system.

Membership:
OPEN

Status: This standard was administratively withdrawn by ANSI on 8/30/2012. A last minute effort to reaffirm the standard was made. The reaffirmation ballot resulted in a few concerns. Without an active working group and subject matter experts to address, it was not possible to resolve the comments. A new working group chair and members are needed.

ANSI/ANS-59.51-1997; R2007, "Fuel Oil Systems for Safety-Related Emergency Diesel Generators" (revision of ANSI/ANS-59.51-1989)

Scope:

This standard provides functional, performance, and initial design requirements for the fuel oil system for diesel generators that provide safety-related emergency onsite power for light water reactor nuclear power plants. This standard addresses the mechanical equipment associated with the fuel oil system, with the exception of the engine mounted components. These components, which are mounted directly to the engine structure itself, are excluded except to define interface requirements. It also includes the instrumentation and control functional requirements. The standard excludes motors, motor control centers, switchgear, cables, and other electrical equipment used in the operation of the fuel oil system, except to define interface requirements.

Membership:
OPEN

Status: Reaffirmation received ANSI approval 10/4/07. No activity in 2013.

ANSI/ANS-59.52-1998; R2007, "Lubricating Oil Systems for Safety-Related Emergency Diesel Generators" (new standard)

Scope:

This standard provides functional, performance, and design requirements for lubricating oil systems for diesel generators that provide emergency onsite power for light water reactor nuclear power plants. The standard addresses all mechanical equipment associated with the lubricating oil system, with the exception of engine mounted components. These components, which are mounted directly to engine structure itself, are excluded, except to define interface requirements. This standard also includes the lubricating oil system instrumentation and control functional requirements. It excludes motors, motor control centers, switchgear, cables, and other electrical equipment used in the operation of the lubricating oil system, except to define interface requirements.

Membership:
OPEN

Status: Reaffirmation received ANSI approval 10/4/07. No activity in 2013.

Simulators, Instrumentation, Control Systems, Software and Testing Subcommittee

Membership:
Ronald Bruno, Chair, Tennessee Valley Authority
Pranab Guha, Vice Chair, U.S. Department of Energy
James August, CORE, Inc.
James Florence, Nebraska Public Power District
James Glover, Graftel, Inc.
Pranab Guha, U.S. Department of Energy
Evan Lloyd, Exitech Corporation
Patrick Salkeld, Westinghouse Electric Company, LLC
Julie Sickle, Constellation Energy Nuclear Group
Marion Smith, STP Nuclear Operating Company
Barbara Stevens, Exelon Corporation

Subcommittee – Simulators, Instrumentation, Control Systems, Software Testing manages the following current standards and projects:

ANS-3.1, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants" (revision of ANSI/ANS-3.1-1993; R1999 – proposed new standard)

Scope:
This standard provides criteria for the selection, qualification, and training of personnel for nuclear power plants. The qualifications of personnel in the operating organizations appropriate to safe and efficient operation of a nuclear power plant are addressed in terms of the minimum education, experience, and training requirements.

Membership:
Julie Sickle, Chair, Constellation Energy Nuclear Group; Ted Amundson, Southern Nuclear Operating Co.; Scott Bauer, Nuclear Energy Institute; Hamer Carter, Progress Energy; Theodore Green, Arizona Public Service; Paul Harlos, Southern Nuclear Operating Co.; Jerry Hiatt, Bartlett Inc.; Al Lindsay, Duke Engery; Gregg Ludlam, Exelon; Paul McNulty, First Energy; Joseph Murray, Public Service Electric and Gas Company; Rick Pelton, U.S. Nuclear Regulatory Commission; Jay Phelps, STP; Chuck Sizemore, Florida Power & Light; Greg Sparks, Entergy; Geoffrey Steele, South Carolina Electric and Gas

Status: The draft was completed and approved by the subcommittee. Subsequently the draft was issued to the Nuclear Facilities Standards Committee (NFSC) for ballot. Comments from the NFSC ballot are currently under consideration by the working group. It is anticipated that a revised draft will be ready mid-2014.

ANSI/ANS-3.2-2012, "Managerial, Administrative, and Quality Assurance Controls for the Operational Phase of Nuclear Power Plants" (revision of ANSI/ANS-3.2-2006)

Scope:

This standard provides requirements and recommendations for managerial and administrative controls to ensure that activities associated with operating a nuclear power plant are carried out without undue risk to the health and safety of the public.

This standard provides requirements for implementing managerial and administrative controls consistent with requirements of 10 CFR 50, Appendix B.

This standard is not specifically intended for application to test, mobile, or experimental reactors, nor reactors not subject to U.S. Nuclear Regulatory Commission (NRC) licensing. Although this standard is based on NRC requirements, the approach is applicable with modifications to reflect the regulatory requirements in the country of application. Applicable sections of this standard may be used in those cases for activities similar to those addressed herein.

Membership:

Marion Smith, Chair, STP Nuclear Operating Company; Clint Eldridge, Vice Chair, Diablo Canyon; Mark Harvey, Unistar/Constellation; Michael Hayse, Exelon Nuclear; Michael Janus, Progress Energy; Charles H. Moseley, Individual; Thomas Niessen, Tennessee Valley Authority; Paul Prescott, U.S. Nuclear Regulatory Commission; George Reed, PSEG Nuclear LLC; Kerry Rhoads, Dominion; Richard Rogalski, Individual; Stanley Stasek, Detroit Edison Company; Richard Sweigart, Duke Energy; Donato Visco, Arizona Public Service Co.; Thomas White, Entergy Nuclear; Dennis Winchester, Exelon

Status: Revision approved by ANSI on 3/20/2012. The standard was reviewed by the NRC and RG 1.33 was revised to endorse the standard. No changes in the standard are anticipated and the standard will be reviewed for update at the five-year interval.

ANSI/ANS-3.4-2013, "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants" (revision of ANSI/ANS-3.4-1996; R2002)

Scope:

This standard defines and updates medical, mental health, and physical requirements for licensing of nuclear power plant reactor operators and senior operators. It also addresses the content, extent, methods of examination, and continual monitoring of licensed operators' medical health.

Membership:

Barbara Stevens, Chair, Exelon Corp.; George Rombold, Vice Chair, Scientech, a business unit of Curtiss-Wright Flow Control Company; Michael Ardaiz, U.S. Department of Energy, Sam Hansell, U.S. Nuclear Regulatory Commission; Tom Jetzer, Occupational Medicine Consultants; Laurie Kubec, NextEra Energy Corp.; Hironori Peterson, U.S. Nuclear Regulatory Commission; Julianne Peterson, Xcel Energy; William Pilkey, Exelon Corp.; Carole Revelle, U.S. Nuclear Regulatory Commission; Jennifer Shaver, Southern California Edison; Michael Zaruba, Auburn Family Health Center

Status: This standard received ANS Standard Board Certification on April 24, 2013, and ANSI approval on April 29, 2013. ANSI/ANS-3.4-2013 was published in July 2013. The USNRC has indicated that they are reviewing the revision, and we expect them to endorse it in Rev. 4 to RG 1.134. It is expected that RG 1.134 Rev 4 will be circulated for public comment in the first quarter 2014. The working group is monitoring and supporting the NRC endorsement process.

ANSI/ANS-3.5-2009, "Nuclear Power Plant Simulators for Use in Operator Training and Examination" (historical revision of ANSI/ANS-3.5-1998 – new standard)

Scope:

This standard establishes the functional requirements for full-scope nuclear power plant control room simulators for use in operator training and examination. The standard also establishes criteria for the scope of simulation, performance, and functional capabilities of the simulators. This standard does not address simulators for test, mobile, and research reactors, or for reactors not subject to U.S. Nuclear Regulatory Commission licensing. This standard does not establish criteria for application of simulators in training programs.

Membership:

James B. Florence, Chair, Nebraska Public Power District-Cooper; Robert A. Felker, Vice Chair, Western Services Corporation; Keith P. Welchel, Secretary, Duke Energy-Oconee; F. J. (Butch) Colby, Editor, L-3 Communications MAAPS; Lawrence Vick, Parliamentarian, U.S. Nuclear Regulatory Commission; Shih-Kao Chang, Dominion Resources-Millstone; William Fraser, Westinghouse Electric Company; Robert Goldman, Entergy; David Goodman, TXU Energy; William Hendy, Institute of Nuclear Power Operations; Jody Lawter, VC Summer Nuclear Station; George S. McCullough, GSE Systems, Inc.; Mac McDade, Progress Energy; Michael Petersen, Xcel Energy; Pablo Rey, Tecnatom, S.A.; James Sale, North Anna Power Station; Frank A. Tarselli, Individual

Status: The ANS-3.5 Working Group is on schedule to submit a draft for the revision of ANSI/ANS-3.5-2009 to being the multi-level approval process in January 2014; our five year maintenance activity ends on 09/04/14.

The ANS-3.5 Working Group met in Tampa, Florida, at the annual Society for Simulation's Conference for Power Plant Simulation in January 2013 to present the following information to nuclear power plant simulation professionals: (1) introduce the membership of the working group, (2) focus areas for the ANS-3.5-201x standard, (3) proposed enhancements to the ANS-3.5-201x standard, (4) industry transition status between standard editions, (5) provide public information regarding the ANS-3.5 webpages, and (6) provide opportunity for questions and answers between standard users and the working group.

The ANS-3.5 Working Group scheduled three working group meetings in 2013: (1) Goodyear, Arizona in April 2013; hosted by the Palo Verde Nuclear Generating Station (Arizona Public Service Company); (2) Plymouth, Massachusetts in July 2013; hosted by the Pilgrim Nuclear Power Station (Entergy); Auburn, Nebraska in November 2013; and (3) hosted by the Cooper Nuclear Station (Nebraska Public Power District). The purpose of each meeting was to address current industry issues not addressed in the ANS-3.5-2009 standard. The largest effort in the development of the

ANS-3.5-201x standard is to address the functional/physical requirements and testing/validation requirements to support next generation (new construction) nuclear power plant simulators. The next working group meeting will be scheduled in early 2014 once comment resolution scope is known regarding the ANS-3.5-201x standard.

ANS-3.13, "Nuclear Facility Reliability Assurance Program (RAP) Development" (proposed new standard)

Scope:

This standard provides criteria to describe nuclear facility reliability assurance programs and to perform scheduled maintenance and/or monitoring of operating conditions. This standard identifies and provides for scheduled maintenance based upon design principles. It provides guidance on how to select components' failure modes and maintenance requirements.

Membership:

James K. August, Chair, CORE, Inc.; Henry Carlton Fuqua, Southern Co.; Jorge Hernandez, Bechtel; Todd Hilsmeier, U.S. Nuclear Regulatory Commission; Al Paglia, South Carolina Electric & Gas Co.; N. Prasad Kadambi, Individual; Curtis Shiley, Southern Nuclear Operating Company; Donald J. Spellman, Oak Ridge National Laboratory

Status: The PINS went through a significant rewrite and was reissued to the Standards Board for approval. Comments from the second review were minimal. It is expected that the PINS will be submitted to ANSI shortly. Members were solicited and teleconferences were held to discuss goals; an outline of the draft was presented to working group members for comment.

ANSI/ANS-56.8-2002; R2011, "Containment System Leakage Testing Requirements" (revision of ANSI/ANS-56.8-1994)

Scope:

This standard specifies acceptable primary containment leakage rate test requirements to assure valid testing. The scope includes (1) Leakage test requirements; (2) Test instrumentation; (3) Test procedures; (4) Test methods; (5) Acceptance criteria; (6) Data analysis;(7) Inspection and recording of test results.

Membership:

James Glover, Chair, Graftel Inc.; Jerome Bettle, U.S. Nuclear Regulatory Commission; Wendell Brown, Shaw Group; Kenneth Clark, Individual; Mark Gowan, TVA (Corporate); Kelvin Green, Tennessee Valley Authority; Howard Hill, Individual; Gary Holtz, Pacific Gas & Electric, Diablo Canyon; Murray Jennex, University of Arizona; Steven Leighty, Westinghouse; Daniel Oakley, Exelon Corporation; Babul Patel, Consultant

Status: The current standard received ANSI approval of a reaffirmation on 8/9/2011. The group is active and meeting and working on a revision to the current standard. We expect to get a final version approved by the working group by the end of 2014.

ANSI/ANS-58.8-1994; R2001, R2008, "Time Response Design Criteria for Safety-Related Operator Actions" (revision of ANSI/ANS-58.8-1984)

Scope:

This standard establishes time response design criteria for safety-related operator actions to be used in the design of light water reactor (LWR) nuclear power plants. The criteria are used to determine the minimum response time intervals for safety-related operator actions that are taken to mitigate design basis events (DBEs) which result in an automatic reactor trip. This standard specifies time requirements that are to be met to receive credit in the safety analysis for operator actions that initiate or control safety-related functions.

Specifically, the criteria provide bases: (1) For establishing certain requirements for determining whether a particular action to initiate or control a safety-related system might be accomplished by operator action or must be accomplished by an automatic action, (2) For determining when design modifications can obviate the need for automatic actions that would otherwise be required, and (3) For general guidance for hardware, such as instrumentation, controls, indicators, and annunciators necessary to support safety-related operator actions.

Membership:
Patrick Salkeld, Chair, Westinghouse; Randall Belles, UT-Battelle/ORNL; David Desaulniers, U.S. Nuclear Regulatory Commission; Robert Fuld, Westinghouse;Göran Hultqvist, Forsmark-Vattenfall; Huafei Liao, Bechtel; Julius Persenky, Idaho National Laboratory

Status: Reaffirmation received ANSI approval 8/25/08. A revised PINS was prepared and submitted to ANSI in 2011. Progress has been slow. The chair is looking for additional working group members to help with the project.

Emergency Planning and Response Subcommittee

Membership*:*
Evan Lloyd, Chair, Exitech Corporation
Steven Gebers, Vice Chair, Quantum Nuclear Services
Ronald Markovich, Contingency Management Consulting

Emergency Planning and Response Subcommittee manages the following projects and current standards:

ANS-3.8.1, "Properties of Radiological Emergency Response Functions and Organizations for Nuclear Facilities" (historical revision of ANSI/ANS-3.8.1-1995 – proposed new standard)

Scope:

This standard establishes properties for identifying emergency response functions and subsequently developing an overall pre-planned emergency response organization for nuclear facilities. The properties address a) basic emergency response functions, b) emergency response support functions, c) emergency response organization, and d) personnel responsibilities.

Membership:
Ronald Markovich, Contingency Management Consulting Group, LLC; Lori Thomas, U.S. Department of Energy; Steve Hook, Individual; William Renz, Entergy Operations

Status: Project Initiation Notification System (PINS) forms were approved and submitted to ANSI for historical revisions to seven emergency preparedness standards; ANS-3.8.1, ANS-3.8.2, ANS-3.8.3 (to incorporate ANS-3.8.4), ANS-3.8.6 (to incorporated ANS-3.8.5), and ANS-3.8.7. A decision was made to initiate ANS-3.8.7 as a risk-informed, performance-based (RIPB) standard as a pilot. Once further along, a path forward for completing the remaining emergency preparedness standards will be determined. No activity in 2013.

ANS-3.8.2, "Properties of Functional and Physical Characteristics of Radiological Emergency Response Facilities at Nuclear Facilities" (historical revision of ANSI/ANS-3.8.2-1995 – proposed new standard)

Scope:
This standard establishes functional and physical properties for facilities needed to provide an adequate overall emergency response. The properties address a) emergency response facilities, b) facility features and requirements, and c) parameters needed to provide a basis for determining an adequate inventory of equipment and supplies for anticipated emergency responses.

Membership:
Ronald Markovich, Chair, Contingency Management Consulting Group, LLC; William Froh, U.S. Department of Energy; Kevin Keyes, Department of Homeland Security; Steve Hook, Individual

Status: Project Initiation Notification System (PINS) forms were approved and submitted to ANSI for historical revisions to seven emergency preparedness standards; ANS-3.8.1, ANS-3.8.2, ANS-3.8.3 (to incorporate ANS-3.8.4), ANS-3.8.6 (to incorporated ANS-3.8.5), and ANS-3.8.7. A decision was made to initiate ANS-3.8.7 as a risk-informed, performance-based (RIPB) standard as a pilot. Once further along, a path forward for completing the remaining emergency preparedness standards will be determined. No activity in 2013.

ANS-3.8.3, "Properties of Radiological Emergency Response Plans and Implementing Procedures and Maintaining Emergency Response Capability for Nuclear Facilities" (historical revision and consolidation of ANSI/ANS-3.8.3-1995 and ANSI/ANS-3.8.4-1995 – proposed ew standard)

Scope:
This standard establishes properties for developing a radiological emergency response plan, emergency plan implementing procedures, and emergency plan administrative procedures for nuclear facilities. Properties include exercises, drills, surveillance, and training.

Membership:
Ronald Markovich, Chair, Contingency Management Consulting Group, LLC; David Freshwater, U.S. Department of Energy; Richard J. Stuhler, U.S. Department of Energy; Kevin Keyes, Department of Homeland Security; Steve Hook, Individual

Status: Project Initiation Notification System (PINS) forms were approved and submitted to ANSI for historical revisions to seven emergency preparedness standards; ANS-3.8.1, ANS-3.8.2, ANS-3.8.3 (to incorporate ANS-3.8.4), ANS-3.8.6 (to incorporated ANS-3.8.5), and ANS-3.8.7. A decision was made to initiate ANS-3.8.7 as a risk-informed, performance-based (RIPB) standard as a pilot. Once further along, a path forward for completing the remaining emergency preparedness standards will be determined. No activity in 2013.

ANS-3.8.6 "Properties of the Conduct of Offsite Radiological Assessment for Emergency Response and Emergency Radiological Field Monitoring, Sampling and Analysis for Nuclear Facilities" (historical revision and consolidation of ANSI/ANS-3.8.5-1992 and ANSI/ANS-3.8.6-1995 – proposed new standard)

Scope:
This standard establishes properties for consequence assessment properties, as well as field monitoring, and sampling and analysis strategy during all phases of and after an emergency to be used for Protective Action Recommendations for nuclear facilities.

Membership:
Ronald Markovich, Chair, Contingency Management Consulting Group, LLC; Lori Thomas, U.S. Department of Energy; Mohammad Pourgol-Mohammad, FM Global

Status: Project Initiation Notification System (PINS) forms were approved and submitted to ANSI for historical revisions to seven emergency preparedness standards; ANS-3.8.1, ANS-3.8.2, ANS-3.8.3 (to incorporate ANS-3.8.4), ANS-3.8.6 (to incorporated ANS-3.8.5), and ANS-3.8.7. A decision was made to initiate ANS-3.8.7, as a risk-informed, performance-based (RIPB) standard as a pilot. Once further along, a path forward for completing the remaining emergency preparedness standards will be determined. No activity in 2013.

ANS-3.8.7, "Properties of Planning, Development, Conduct, and Evaluation of Drills and Exercises for Emergency Preparedness at Nuclear Facilities" (historical revision of ANSI/ANS-3.8.7-1998 – proposed new standard)

Scope:
This standard establishes properties for the planning, development, conduct and evaluation of radiological emergency response drills and exercises in support of emergency preparedness at nuclear facilities. In addition, this standard will incorporate the requirements for the conduct of Hostile Action-Based Emergency Response drills.

Membership:

Ronald Markovich, Chair, Contingency Management Consulting Group, LLC; ; Stephen Luckett, DOE; Steve Hook, Individual; William Renz, Entergy Nuclear; Kevin Keyes, Department of Homeland Security; Steven Erickson, Contingency Management Consulting Group, LLC; Martin Hug, NEI; Scott McCain, EP Tec, Inc; Randy Sullivan, U.S. Nuclear Regulatory Commission; Donald Tailleart, U.S. Nuclear Regulatory Commission

Status: ANS-3.8.7 is the standard to be developed as a pilot for the proposed EP standards; it is a document to be used by both the commercial nuclear industry and DOE. The concept continues to be for the ANS commercial nuclear membership to develop the standard (since the NRC new rulemaking addressed this area) and then present to the ANS Department of Energy membership for incorporation of their requirements. Unfortunately, continued push back has been received by the commercial nuclear industry, thru NEI, stating that they will not participate in development of the standard. NEI issued a letter on October 23, 2012, to ANS indicating their disapproval of development of this standard and requesting that ANS not develop one. Additionally, the industry, through INPO, are in the process of development of an industry drill and exercise manual. After internal discussions, ANS determined it would continue with the development of the EP standards citing that ANS has multiple customers, not only the commercial nuclear industry, and issued its response in a letter dated December 17, 2012. As such, the ANS-3.8.7 membership re-engaged in the finalization of the standard, however, this push back by the industry has significantly delayed progressing on the development of the standard. A draft has been completed which includes the NRC new rulemaking requirements and has been through internal review. Team members have been in the process of engaging DOE to provide input to the draft standard, however have been unsuccessful to date. Concern continues regarding the acceptance of this standard by the commercial nuclear industry.

Large Light Water Reactor (LLWR) Consensus Committee
Organizational Chart
Chair: William B. Reuland Vice Chair: Timothy K. Meneely

Light Water Reactor & Reactor Auxillary Systems Designs	Power Generation & Plant Support Systems	Simulators, Instrumentation, Control Systems, Software & Testing	Emergency Planning & Response
Chair: Dennis Newton Vice-Chair: Bill Bell	**Chair: Rocky Kreider Vice-Chair: James Saldarini**	**Chair: Ronald Bruno Vice-Chair: Pranab Guha**	**Chair: Evan Lloyd Vice-Chair: Steven Gebers**
4 = Active Projects	3 = Active Projects	2 = Active Project	5 = Active Projects
3 = Current Standards	3 = Current Standards	5 = Current Standards	0 = Current Standards
ANS-18-1-(W2009) Radioactive Source Term for Normal Operation of Light Water Reactors	ANS-56.1 Containment Hydrogen Control	ANS-3.1-(W2009) Selection, Qualification, and Training of Personnel for Nuclear Power Plants	ANS-3.8.1-(W2005) Properties of Radiological Emergency Response Functions and Organizations for Nuclear Facilities
ANS-50.1 Nuclear Safety Criteria for the Design of Stationary Light Water Reactor Plants	ANS-58.3-1992 (R2008) Physical Protection for Nuclear Safety-Related Systems and Components RF 10/28/08	ANS-3.2-2012 Managerial, Administrative, and Quality Assurance Controls for the Operational Phase of NPPs Approved 3/20/12	ANS-3.8.2-(W2005) Properties of Functional and Physical Characteristics of Radiological Emergency Response Facilities at Nuclear Facilities
ANS-51.10-1991 (R2008) Auxiliary Feedwater System for Pressurized Water Reactors RF 10/14/08	ANS-58.2-(W1998) Design Basis for Protection of Light Water Nuclear Power Plants Against the Effects of Postulated Pipe Rupture	ANS-3.4-2013 Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants Approved 4/29/13	ANS-3.8.3-(W2005) Properties of Radiological Emergency Response Plans and Implementing Procedures and Maintaining Emergency Response Capability for Nuclear Facilities
ANS-58.6-(W2011) Criteria for Remote Shutdown for Light Water Reactors Facilities	ANS-59.3-(W2010) Nuclear Safety Criteria for Control Air Systems	ANS-3.5-2009 Nuclear Power Plant Simulators for Use in Operator Training and Examination Approved 9/4/09	ANS-3.8.6-(W2005) Properties of Radiological Emergency Response Plans and Implementing Procedures and Maintaining Emergency Response Capability for Nuclear Facilities
ANS-58.9-2002 (R2009) Single Failure Criteria for Light Water Reactor Safety-Related Fluid Systems RF 2/24/09	ANS-59.51-1997 (R2007) Fuel Oil Systems for Safety-Related Emergency Diesel Generators RF 10/4/07	ANS-3.13 (NEW) Nuclear Facility Reliability Assurance Program (RAP) Development	ANS-3.8.7-(W2008) Properties of Planning, Development, Conduct, and Evaluation of Drills and Exercises for Emergency Preparedness at Nuclear Facilities
ANS-58.11-(W2012) Design Criteria for Safe Shutdown Following Selected Design Basis Events in Light Water Reactors	ANS-59.52-1998 (R2007) Lubricating Oil Systems for Safety-Related Emergency Diesel Generators RF 10/4/07	ANS-56.8-2002 (R2011) Containment System Leakage Testing Requirements RF 8/9/11	
ANS-58.14-2011 Safety and Pressure Integrity Classification Criteria for Light Water Reactors Approved 4/22/11		ANS-58.8-1994 (R2008) Time Response Design Criteria for Safety-Related Operator Actions RF 8/25/08	

Table 4 – LLWR Organizational Chart

Nonreactor Nuclear Facilities (NRNF) Consensus Committee

James O'Brien, Chair
U.S. Department of Energy

Scope:

The NRNF Consensus Committee is responsible for the preparation and maintenance of voluntary consensus standards for the safety analysis, design, maintenance, operator selection and training, and quality requirements for nonreactor nuclear facilities including facilities using radioactive isotopes, remote handling of radioactive materials, fuel processing, mixed oxide fuel processing and other fuel cycle facilities other than spent fuel handling and storage. The ANS Standards Committee Procedures Manual for Consensus Committees shall be used to guide the activities of this consensus committee.

NRNF Membership:

James O'Brien, Chair, U.S. Department of Energy
Jeffery R. Brault, Vice Chair, Individual
Robert A. Bari, Brookhaven National Laboratory
Robert G. Eble, Jr., AREVA
Mukesh K. Gupta, URS Safety Management Solutions
Gerald E. Hicks, U.S. Department of Energy / NNSA
Herbert W. Massie, Jr., Defense Nuclear Facilities Safety Board
Carl A. Mazzola, CB&I Special Services
James F. Miller, SABIA, Inc.
Mohammad Modarres, University of Maryland
Brian Smith, U.S. Nuclear Regulatory Commission
Donald J. Spellman, Oak Ridge National Laboratory
Jennifer K. Wheeler, Nuclear Fuel Services, Inc.

Report of NRNF:

The NRNF held its inaugural meeting on November 13, 2013, during the ANS Winter Meeting in Washington D.C.

Approved in 2013:

No standards approved in 2013.

Active Standards/Projects:

ANS-3.14, "Process for Aging Management and Life Extension for Nonreactor Nuclear Facilities" (proposed new standard)

ANS-57.11, "Integrated Safety Assessments for Fuel Cycle Facilities" (proposed new standard)

ANS-58.16, "Safety Classification and Design Criteria for Nonreactor Nuclear Facilities" (proposed new standard)

The NRNF Consensus Committee supervises the work of the following projects:

ANS-3.14, "Process for Aging Management and Life Extension for Nonreactor Nuclear Facilities" (proposed new standard)

Scope:

This standard addresses requirements for systematically evaluating structures, systems, and components (SSCs) for extending the life of nonreactor nuclear facilities. This standard is applicable to facilities that are 15 to 30 years old and expect to operate for an additional 20 to 30 years. This standard provides a systematic process to determine the scope of the aging management/life extension program in terms of SSCs. For those SSCs, a process for the evaluation of remaining lifetime and determining the need for additional analysis, repairs, inspections, and replacements is developed.

Membership:

Herbert W. Massie, Chair, Defense Nuclear Facilities Safety Board; Mark Blackburn, Department of Energy; Frederic Grant, Simpson Gumpertz & Heger Inc.; William Gunther, Brookhaven National Laboratory; Craig McMullin, Savannah River National Laboratory; Mark Sapia, General Electric; Brian Smith, Nuclear Regulatory Commission; James Wittkop, Nuclear Fuel Services

Status: The PINS was approved in 2013 and submitted to ANSI. The ANS-3.14 Working Group Chair is recruiting additional members for the working group to prepare the draft.

ANS-57.11, "Integrated Safety Assessments for Nonreactor Nuclear Facilities" (proposed new standard)

Scope:

This standard provides an ISA method consistent with 10 CFR Part 70 regulations to identify credible accident sequences that can lead to "high" or "intermediate" consequences as outlined in performance requirements. The ISA also specifies safety controls to prevent or mitigate those potential accidents and assess the likelihood that the facilities would meet the performance requirements, and management measures a facility operator will rely on to ensure that safety controls are available to perform their function. ISAs evaluate not just radiological and nuclear criticality hazards, but chemical and fire hazards as well.

The emphasis of this standard is aimed at making nonreactor nuclear facility safety requirements more risk-informed, performance-based, predictable and objective. The results of this standard, i.e., identification of hazards and design events can be integrated into that of ANS-58.16 Safety Categorization and Design Criteria for Nonreactor Nuclear Facilities.

Membership:

Robert Eble, Chair, AREVA MOX; Sven Bader, AREVA MOX; David Faidley, B&W; Robert Faris, Westinghouse Fuel Fabrication; Thomas Hiltz, Department of Energy; Gary Kaplan, RSL Safety; Al Kennedy, Global Laser Enrichment; Calvin Manning, AREVA Richland; Andrew Maurer, Nuclear Energy Institute; Arielle Miller, AREVA; Kevin Morrissey, U.S. Nuclear Regulatory Commission; Wyatt Padgett, Urenco; Robert Pierson, Talisman; Janet Schlueter- Nuclear Energy Institute; Jennifer Wheeler, Nuclear Fuel Solutions; Mosi Dayani, NNSA-Savannah River; Associate Member

Status: To date we have developed a draft that has been through internal review. Comments totaling 337 were received and resolved at the annual ANS meeting in DC in November. Comment resolutions were incorporated into the revised draft and will be sent out for final review in early 2014. We are in the process of revising the PINS to expand the scope for all nonreactor nuclear facilities. The current draft reflects this position. Future activities include: Preparing a clean draft for external review by mid-March 2014. This review will include representatives from all stakeholder organizations. The working group is planning to meet in April 2014 to resolve comments and have a clean draft for the consensus committee review by June. To date the working group has met 12 times via teleconference and 2 times in person.

ANS-58.16, "Safety Categorization and Design Criteria for Nonreactor Nuclear Facilities" (proposed new standard)

Scope:

This standard provides guidance and criteria for safety categorization of items structures, systems, components (SSCs) and administrative controls associated with nuclear safety in nonreactor nuclear facilities such as: nuclear storage and processing facilities, nuclear material and radioactive waste facilities, and nuclear fuel examination facilities. This standard elaborates on how to derive safety functions, and develop design and operational requirements to satisfy these functions. It also associates the safety categorization of items to engineering (e.g., civil/structural, mechanical, electrical) and programmatic (e.g., QA) classification levels. Finally, this Standard defines functional and boundary criteria for safety SSCs to include associated SSCs necessary for the operation of a safety SSC when called upon to provide its safety function.

Membership:

Pranab Guha, Chair, U.S. Department of Energy; Robert Eble, Co-Chair, Savannah River Solutions MOX; Randy Bunt, Southern Nuclear Co.; Chris Chaves, U.S. Department of Energy; David Cook, Oak Ridge National Laboratory; Gerald Couture, Westinghouse Electric; Mosi Dayani, Savannah River Solutions MOX; Richard Englehart (late), Individual; Gregory Jones, ORP; Pradyot K. Niyogi, U.S. Department of Energy; Mark Ramsay, U.S. Department of Energy/ORP; Kevin Ramsey, U.S. Nuclear Regulatory Commission; Louis Restrepo, Nuclear Safety Associates; Subir Sen, U.S. Department of Energy; John Stevenson, Individual.

Status: NFSC members have many significant comments on this first-of-its-kind standard for nonreactor nuclear facility design. In 2013, the working group worked on resolution of these comments through a number of conference calls, and modified the standard accordingly. Unlike reactors, for nonreactor nuclear facilities, pre-determination of safety categorization based on system design and safety analyses is not possible because of the variations in facility types and their hazards. Therefore, a generic set of criteria and guidelines are presented to support identification of safety categorization of SSCs, using hazard analysis and establishment of design criteria, commensurate with their safety importance. The hazard analysis and determination of safety functions for hazard controls, however, is not in the scope of this standard. A new standard, ANS-57.11-201x, "Integrated Safety Assessments for Fuel Cycle Facilities," is being developed that would supplement this standard.

The draft standard was sent for the second round of review/comments/ballot by the Nuclear Facilities Standards Committee (NFSC) members during the third quarter of 2013. The second round of comments from NFSC members were received during the last quarter of 2013. The working group is finalizing the resolutions of these comments and will release the draft standard for final review and balloting in early 2014.

Nonreactor Nuclear Facilities (NRNF) Consensus Committee List of Standards/Projects Chair: James O'Brien Vice Chair: Jeffery R. Brault		
ANS-3.14	Process for Aging Management and Life Extension for Nonreactor Nuclear Facilities	Active Project
ANS-57.11	Integrated Safety Assessments for Fuel Cycle Facilities	Active Project
ANS-58.16	Safety Classification and Design Criteria for Nonreactor Nuclear Facilities	Active Project
ANS-11.1	General Criteria for Design, Construction, Operation, Maintenance, and Decommissioning for Radioactive Materials Handling Facilities	Inactive Project
ANS-11.3	Shielding Wall Service Penetrations	Inactive Project
ANS-11.4	Direct View Windows	Inactive Project
ANS-11.6	Direct Viewing/TV-Audio	Inactive Project
ANS-11.7	Access Doors and Transfer Devices for Personnel and Equipment	Inactive Project
ANS-11.8	Illumination	Inactive Project
ANS-11.9	Manipulators, Auxiliary Tools and Remote Handling Devices	Inactive Project
ANS-11.2	Hot Cell Atmosphere Control Systems	Inactive Project
ANS-11.13	In-Cell Utility Requirements	Inactive Project
ANS-11.14	Design Guide for Fire Prevention, Detection and Control for Radioactive Materials Handling Facilities	Inactive Project
ANS-11.15	Wall Finishes and Protective Coatings	Inactive Project
ANS-11.16	Gloveboxes	Inactive Project
ANS-11.17	Operations and Maintenance of Radioactive Materials Handling Facilities	Inactive Project
ANS-40.6	Design Guide for a Radioisotope Laboratory (Type B)	Inactive Project

Table 5 – NRNF List of Standards/Projects

Research and Advanced Reactors (RAR) Consensus Committee

George Flanagan, Chair
Oak Ridge National Laboratory

Scope:

The RAR Consensus Committee is responsible for the preparation and maintenance of voluntary consensus standards for the design, operation, maintenance, operator selection and training, and quality requirements for current and future research and test reactors including pulsed critical facilities, reactors used for the production of isotopes for industrial, educational, and medical purposes and current and advanced non-large LWRs. The scope includes but is not limited to: water-cooled and non-water cooled Small Modular Reactors, Generation III+ and IV reactors, and future non-light water cooled/moderated large commercial reactors.

The RARCC standards include but are not limited to the design and operation of the nuclear island, the balance of plant, and other systems within the plant boundary affecting safety and operations. The ANS Standards Committee Procedures Manual for Consensus Committees shall be used to guide the activities of this consensus committee.

Subcommittees have been established to manage the activities of working groups and to erform detailed reviews of proposed standards for technical need, relevance, and acceptability. Each subcommittee has been assigned a unique and specific area of technical responsibility.

These subcommittees have been organized as follows:

Operation of Research Reactors (ANS-15)
Advanced Initiatives (ANS-29)

Each subcommittee has established various working groups to develop specific proposed standards and maintain existing standards within its respective area of responsibility. These working groups create the text of RARCC standards and resolve review and ballot comments.

RAR Membership:

George Flanagan, Chair, Oak Ridge National Laboratory
Bruce B. Bevard, Vice Chair, Oak Ridge National Laboratory
D. Sean O'Kelly, Vice Chair, National Institute of Standards & Technology
Alexander Adams, Jr., U.S. Nuclear Regulatory Commission
Gary Adkins, Tennessee Valley Authority
James K. August, CORE, Inc.
Edward D. Blandford, University of New Mexico
Robert E. Carter, Individual
Leslie P. Foyto, University of Missouri
Tony Grenci, CB&II
Thomas A. Kevern, U.S. Nuclear Regulatory Commission
David R. Lawson, U.S. Department of Energy
Matthew J. Memmott, Westinghouse Electric Company
Marya K. Morrison, Idaho National Laboratory
Thomas J. Myers, National Institute of Standards & Technology

Mark W. Peres, Fluor Enterprises, Inc.
Steven R. Reese, Oregon State University
Theodore R. Schmidt, Individual
Richard S. Turk, Rick Turk, LLC

Report of RAR:
The RAR held its inaugural meeting on November 13, 2013, during the ANS Winter Meeting in Washington D.C.

Approved in 2013:
ANSI/ANS-15.1-2007 (R2013), "The Development of Technical Specifications for Research Reactors" (reaffirmation of ANSI/ANS-15.1-2007)

ANSI/ANS-15.8-1995 (R2013), "Quality Assurance Program Requirements for Research Reactors" (reaffirmation of ANSI/ANS-15.8-1998; R2013))

Active Standards/Projects:
ANS-15.4, "Selection and Training of Personnel for Research Reactors" (revision of ANSI/ANS-15.4-2007)

ANS-20.1, "Nuclear Safety Criteria and Design Process for Fluoride Salt-Cooled High-Temperature Reactor NPPs" (proposed new standard)

ANS-54.1 "Nuclear Safety Criteria and Design Process for Liquid-Sodium-Cooled-Reactor NPPs" (historical revision of ANSI/ANS-54.1-1989 – proposed new standard)

Advanced Initiatives Subcommittee (ANS-29)

Membership:
Bruce Bevard, Chair, Oak Ridge National Laboratory
Edward Blandford, University of New Mexico
James August, CORE, Inc.
Zhimin Dai, Chinese Academy of Sciences
Matthew Denman, Sandia National Laboratory
George Flanagan, Oak Ridge National Laboratory

Advanced Initiatives subcommittee manages the following projects and current standards:

ANS-20.1, "Nuclear Safety Design Criteria for Fluoride Salt-Cooled High-Temperature Reactor Nuclear Power Plants" (proposed new standard)

Scope:
This standard establishes the nuclear safety design criteria and design requirements for a fluoride salt-cooled, high-temperature reactor. The standard reflects performance-based, risk-

informed criteria wherever possible. It also describes the design process to establish those criteria and addresses structures, systems, and component classifications.

Membership:
Edward Blandford, co-chair, University of New Mexico; Zhimin Dai, co-chair, Chinese Academy of Sciences; Matthew Denman, co-chair, Sandia National Laboratory; George Flanagan, Oak Ridge National Laboratory; Tom Kevern, US Nuclear Regulatory Commission; Matt Memmott, Westinghouse Corporation; Charles Forsberg, Massachusetts Institute of Technology; Ron Cocherell, Southern Nuclear Company; Per Peterson, University of California at Berkeley; Zhaolin Chen, Chinese National Nuclear Safety Administration; Bojan Petrovich, Georgia Institute of Technology; Carl Stoots, Idaho National Laboratory

Status: A PINS for this proposed new standard was approved and submitted to ANSI. Work has begun on the proposed standard.

ANSI/ANS-53.1-2011, "Nuclear Safety Design Process for Modular Helium-Cooled Reactor Plants" (new standard)

Scope:
This standard applies to the safety design process for MHR nuclear power plants. This standard provides a process for establishing top-level safety criteria (TLSC), safety functions, top-level design criteria (TLDC), licensing basis events (LBEs), design basis accidents (DBAs), safety classification of systems, structures, and components (SSC), safety analyses, defense-in-depth (DID), and adequate assurance of special treatment requirements for safety-related SSC throughout the operating life of the plant. The standard does not provide detailed guidance for design; other existing standards cover those.

Membership:
James August, Chair, CORE, Inc.; John Bolin, GATech; Karl Fleming, Tech Insights (PBMR); John Gaertner, Electric Power Research Institute; Ben Holtzman, Westinghouse; Lewis Lommers, AREVA; Pete Lowry, PNL; Stuart Rubin, U.S. NRC; Farshid Shahrokhi, AREVA; Don Spellman, ORNL; Edward Wallace, NuScale Power Inc.

Advisory Group: Stephen Asztalos, LBL; Syd Ball, ORNL; Richard Black, U.S. DOE (retired); Rob Bratton, INL; Mark Holbrook, INL; Kamiar Jamali, NNSA DOE; Phillip Mills, INL; Nicholas Tricot, IAEA

Status: Received ANSI approval on December 21, 2011. No activity needed.

ANS-54.1, "Nuclear Safety Criteria and Design Process for Liquid-Sodium-Cooled Nuclear Power Plants" (historical revision of ANSI/ANS-54.1-1989 – proposed new standard)

Scope:
This standard establishes the nuclear safety criteria, functional performance and design

requirements for liquid-sodium-cooled nuclear power plants. The document uses performance-based, risk-informed PRA criteria wherever possible. It also describes the design process to be followed to establish those criteria and perform structures, systems, and component classifications.

Membership:
George Flanagan, Chair, ORNL, Robert Budnitz, Vice Chair, LBNL; Robert Bari, BNL; Neil Brown, Individual; Kamal El-Sheikh, The Cameron Group, Inc.; Michael Garrett, TerraPower; Chris Grandy, Argonne National Lab.; Tony Grenci Westinghouse; Prasad Kadambi, Individual; Thomas Kevern, U.S. Nuclear Regulatory Commission; Thomas King, Information Systems Laboratory, Inc; Christian Lobscheid, NuScale Power LLC; Eric Loewen, GE Hitachi Nuclear Energy; Imitiaz Madni, U.S. Nuclear Regulatory Commission; Hisato Matsumiya, Toshiba; Arielle Miller, AREVA; Yasushi Okano, Japan Atomic Energy Agency; Ronald Omberg, Battelle-NW; Toshiba; Roald Wigeland, INL

Status: The technical sections of the standard have been drafted and were reviewed by members of the working group. These are being edited and reformatted within the standard as agreed to by the working group members. Checks are being made to assure requirements are clearly stated. The plan is to have a draft available to begin the multi-level review and approval process by the end of 2014.

Operation of Research Reactors Subcommittee (ANS-15)

Membership:
Sean O'Kelly, Chair, National Institute of Standards & Technology
Alexander Adams, Jr., U.S. Nuclear Regulatory Commission
Leslie Foyto, University of Missouri
Thomas Myers, National Institute of Standards & Technology
Daniel Pinkston, Oak Ridge National Laboratory
Steven Reese, Oregon State University
Joseph Reyenga, National Institute of Standards & Technology
Theodore Schmidt, Individual
Randolph Strader, National Institute of Standards & Technology

Operation of Research Reactors Subcommittee manages the following projects and current standards:

ANSI/ANS-1-2000; R2007, R2012, "Conduct of Critical Experiments" (revision of ANSI/ANS-1-1987; R1992)

Scope:
This standard provides for the safe conduct of critical experiments. Such experiments study neutron behavior in a fission device where the energy produced is insufficient to require auxiliary cooling, and the power history is such that the inventory of long-lived fission products is insignificant.

Membership:

Theodore Schmidt, Chair, Sandia National Laboratories; Robert Busch, University of New Mexico; Gary A. Harms, Sandia National Laboratories; Ronald Knief, Sandia National Laboratories; Thomas McLaughlin, Individual; Richard Paternoster, Los Alamos National Laboratory; Steven Payne, U.S. Department of Energy; Jeffrey Philbin, Sandia National Laboratories; [Robert Seale, University of Arizona—Emeritus (deceased)]; Abraham Weitzberg, Individual

Status: Reaffirmation received ANSI approval 10/5/2012. Dr. Searle passed away in 2013. We expect to have the standard reaffirmed in 2017.

ANSI/ANS-14.1-2004; R2009, "Operation of Fast Pulse Reactors" (revision of ANSI/ANS-14.1-1975; R1982; R1989; R2000)

Scope:

This standard is for those involved in the design, operation, and review of fast pulse reactors. It has been formulated in general terms to be applicable to all current fast pulse reactors. This standard does not apply to periodically pulsed reactors or booster assemblies.

Membership:

Theodore Schmidt, Chair, Sandia National Laboratories; Rick Anderson, Los Alamos National Laboratory; James Bryson, Sandia National Laboratories; Matt Burger, Sandia National Laboratories; Armando De La Paz, Vista Technologies; James Felty, Science Applications International Corporation; Michael Flanders, White Sands Missile Range; Abdul Kazi, Aberdeen Pulse Radiation Facility; Ronald Knief, Sandia National Laboratories; Marvin Mendonca, U.S. Nuclear Regulatory Commission; Douglas Minnema, National Nuclear Security Administration; Gerald Schlapper, National Nuclear Security Administration

Status: This standard received ANSI approval of a reaffirmation on 10/27/09. There were a few minor comments during the reaffirmation process that will be addressed once there is sufficient need for a revision. The standard will be reviewed and consideration for reaffirmation again in 2014.

ANSI/ANS-15.1-2007, "The Development of Technical Specifications for Research Reactors" (revision of ANSI/ANS-15.1-1990; R1999)

Scope:

This standard identifies and establishes the content of technical specifications (TS) for research and test reactors. Areas addressed are: Definitions, Safety Limits (SL), Limiting Safety System Settings (LSSS), Limiting Conditions for Operation (LCO), Surveillance Requirements (SR), Design Features, and Administrative Controls. Sufficient detail is incorporated so that applicable specifications can be derived or extracted.

Membership:

Les Foyto, Chair, University of Missouri; Alexander Adams, U.S. Nuclear Regulatory Commission, Leo Bobek, University of Massachusetts-Lowell; Dan Cronin, University of Florida; Steve Miller, Armed Forces Radiobiology Research Institute; Sean O'Kelly, National Institute of Standards and

Technology; Steve Reese, Oregon State University; Theodore Schmidt, Sandia National Laboratories; Brian Shea, University of Florida

Status: Research reactor licensees and NRC staff have discussed updating definitions and phrases in the standard from lessons learned during recent license renewals. Standard was reaffirmed in 2013. A PINS is expected to be submitted in 2014 to initiate changes to the standard.

ANSI/ANS-15.2-1999; R2009, "Quality Control for Plate-Type Uranium-Aluminum Fuel Elements" (revision of ANSI/ANS-15.2-1990)

Scope:

This standard sets forth general requirements for the establishment and execution of a program designed to verify that the quality of plate-type uranium-aluminum fuel elements being purchased for research reactors conforms to the requirements of the contract and applicable technical documents, including specifications, standards, and drawings.

Membership:
Daniel Pinkston, Co-Chair, Oak Ridge National Laboratory; Marya Morrison, Co-Chair, Idaho National Laboratory; Jeff Brower, Idaho National Laboratory; Clinton Cooper, Idaho National Laboratory; Randy Strader, National Institute of Standards and Technology; John Sease, Retired

Status: No updates are planned for this standard in the immediate future.

ANSI/ANS-15.4-2007, "Selection and Training of Personnel for Research Reactors" (revision of ANSI/ANS-15.4-1988; R1999)

Scope:

This standard sets the qualification, training, and certification criteria for operations personnel at research reactors and establishes the elements of a program for periodic re-qualification and re-certification. The standard is predicated on levels of responsibility rather than on a particular organizational concept.

Membership:
Thomas Myers, Chair, National Institute of Standards and Technology; Leo Bobek, University of Massachusetts – Lowell; Christopher Heysel, McMaster University; Daniel Hughes, National Institute of Standards and Technology; Michael Krause, University of Texas at Austin; Steve Miller, Armed Forces Radiobiology Research Institute; Phillip Young, U.S. Nuclear Regulatory Commission.

Status: Received ANSI approval 8/17/2007. A PINS was approved in 2013 for revision of the current standard. Reviews by the working group of the draft revisions have been completed and comments addressed, including updates to the medical section of the standard and resolution of perceived inconsistencies with the requirements of one regulatory authority. A final draft of the standard will be sent to the members of the working group in early 2014 confirming agreement with

the content of the standard, followed by submittal to the subcommittee of the draft standard in April 2014.

ANSI/ANS-15.8-1995; R2005; R2013, "Quality Assurance Program Requirements for Research Reactors" (revision of ANSI/ANS-15.8-1976; R1986)

Scope:

The standard provides criteria for quality assurance in the design, construction, operation, and decommissioning of research reactors.

Membership:

Randy Strader, Chair, National Institute of Standards and Technology; Paul Brand, National Institute of Standards and Technology; Les Foyto, University of Missouri; William Schuster, Nuclear Regulatory Commission

Status: A reaffirmation was approved by ANSI on 5/10/2013. No activity planned for 2014.

ANSI/ANS-15.11-2009, "Radiation Protection at Research Reactor Facilities" (revision of ANSI/ANS-15.11-1993; R2004)

Scope:

This standard establishes the elements of a radiation protection program and the criteria necessary to provide an acceptable level of radiation protection for personnel at research reactor facilities and the public consistent with keeping exposures and releases as low as is reasonably achievable (ALARA).

Membership:

Steve Reese, Chair, Oregon State University; Craig Bassett, U.S. Nuclear Regulatory Commission; David Brown, National Institute of Standard and Technology; Ronald Dobey, University of Missouri; Wesley Frey, University of California at Davis

Status: Work will begin in 2014 to update the standard to reflect changes in regulation and timely review of applicability. A PINS will be prepared.

ANS-15.15, "Criteria for the Reactor Safety Systems of Research Reactors" (revision of historical standard ANSI/ANS-15.15-1978 – proposed new standard)

Scope from 1978 standard:

This standard documents the criteria from which appropriate specific design requirements may be established for the reactor safety system of an individual research reactor.

Membership:

Joseph Reyenga, Chair, National Institute of Standards and Technology; Leo Bobek, University of Massachusetts-Lowell; Dan Cronin, University of Florida; Duane Hardesty, U.S. Nuclear Regulatory Commission; Leroy Hardin, Nuclear Regulatory Commission; Jere Jenkins, Thermo-Fisher Scientific

Status: A project to resurrect the 1978 standard is expected to start in 2014.

ANSI/ANS-15.16-2008, "Emergency Planning for Research Reactors" (revision of ANSI/ANS-15.16-1982; R1988; R2000)

Scope:

This standard identifies the elements of an emergency plan which describes the approach to coping with emergencies and minimizing the consequences of accidents at research reactor facilities. The emphasis given each of these elements shall be commensurate with the potential risk involved. The emergency plan shall be implemented by emergency procedures.

Membership:

Steve Reese, Chair, Oregon State University; Alexander Adams, Nuclear Regulatory Commission; Leo Bobek, University of Massachusetts-Lowell; James Bryson, Sandia National Laboratories; Les Foyto, University of Missouri; Dan Hughes, National Institute of Standards and Technology; Steve Miller, Chair, Armed Forces Radiobiology Research Institute

Status: A project to update and revise the standard will be initiated in 2014.

ANSI/ANS-15.21-1996; R2006, "Format and Content for Safety Analysis Reports for Research Reactors" (new standard)

Scope:

This standard identifies specific information and analyses for inclusion in the safety analysis report for research reactors and establishes a uniform format for the repot. This standard provides the criteria for the format and content for safety analysis reports for research reactors.

Membership:

Alexander Adams, Nuclear Regulatory Commission; Steven Miller, Armed Forces Radiobiology Research Institute, National Naval Medical Center; Steven Reese, Oregon State University; Clifford Stanley, Idaho National Laboratory

Status: A revision of ANSI/ANS-15.21-1996; R2006 was approved by ANSI in 2012, but an error identified in the standard during publication resulted in a request to void their approval. This allowed disclosure to the consensus committee and a request for their approval to make the correction as it was deemed a substantive change. Once approval is acquired, a request will be made to ANSI to reapprove the standard with the year of 2012 in the designation.

Research & Advanced Reactors (RAR) Consensus Committee Organizational Chart

Chair: George F. Flanagan
Vice Chairs: Bruce B. Bevard & Sean O'Kelly

ANS-15	ANS-29
Operation of Research Reactors	**Advanced Initiatives**
D. Sean O'Kelly (Chair)	**Bruce B. Bevard (Chair)**
9 Current Standards	**1 Current Standards**
1 Project	**2 Projects**
1-2000 (R2012) Conduct of Critical Experiments RF 10/5/2012	20.1-(NEW) Nuclear Safety Criteria and Design Process for Fluoride Salt-Cooled High-Temperature Reactor NPPs
14.1-2004 (R2009) Operaton of Fast Pulse Reactors RF 10/27/09	53.1-2011 Nuclear Safety Design Process for Modular Helium-Cooled Reactor Plants App'd 12/22/11
15.1-2007 (R2013) Develoment of Technical Specifications for Research Reactors App'd 4/24/13	54.1-(W1999) Nuclear Safety Criteria and Design Process for Liquid-Sodium-Cooled-Reactor NPPs
15.2-1999 (R2009) Quality Control for Plate-Type Uranium-Aluminum Fuel Elements RF 3/23/09	
15.4-2007 Selection and Training of Personnel for Research Reactors App'd 8/17/07	
15.8-1995 (R2013) Quality Assurance Program Requirements for Research Reactors RF 5/10/13	
15.11-2009 Radiation Protection at Research Reactors App'd 10/8/09	
15.15 (W1996) Criteria for the Reactor Safety Systems of Research Reactors	
15.16-2008 Emergency Planning for Research Reactors App'd 9/23/08	
15.21-1996 (R2006) Format and Content for Safety Analysis Reports for Research Reactors App'd 9/26/06	

Table 6 – RAR Organizational Chart

Safety and Radiological Analysis (SRA) Consensus Committee

Andrew O. Smetana, Chair
Savannah River National Laboratory

Scope:

The SRA Consensus Committee is responsible for the preparation and maintenance of voluntary consensus standards for physics methods and measurements for nuclear facilities, shielding materials and methods for shielding analyses, safety analyses and for the associated computational methods and computer codes. Input data for calculations and codes, such as nuclear cross sections, are included in this scope. The ANS Standards Committee Procedures Manual for Consensus Committees shall be used to guide the activities of this consensus committee.

Subcommittees have been established to manage the activities of working groups and to perform detailed reviews of proposed standards for technical need, relevance, and acceptability. Each subcommittee has been assigned a unique and specific area of technical responsibility.

These subcommittees have been organized as follows:

Mathematics & Computation (ANS-10)
Reactor Physics (ANS-19)
Shielding (ANS-6)

Each subcommittee has established various working groups to develop specific proposed standards and maintain existing standards within its respective area of responsibility. These working groups create the text of SRA standards and resolve review and ballot comments.

SRA Membership:

Andrew O. Smetana, Chair, Savannah River National Laboratory
Abraham Weitzberg, Vice Chair, Individual
F. Arzu Alpan, Westinghouse Electric Company
Richard S. Amato, Bechtel Bettis, Inc.
Michaele C. Brady Raap, Battelle-Northwest Division
Richard R. Brey, Health Physiscs Society (Employed by Idaho State University)
Robert E. Carter, Individual
Dimitrios M. Cokinos, Brookhaven National Laboratory
Michael L. Corradini, NCRP, Employed by University of Wisconsin – Madison
Donald J. Dudziak, Los Alamos National Laboratory
Mukesh K. Gupta, URS Safety Management Solutions
Nolan E. Hertel, Georgia Institute of Technology
Charles T. Rombough, CTR Technical Services, Inc.
Charlotta E. Sanders, University of Las Vegas – Nevada

Report of SRA:

The SRA held its inaugural meeting on November 13, 2013, during the ANS Winter Meeting in Washington D.C.

Approved in 2013:

ANSI/ANS-5.10-1998 (R2013), "Airborne Release Fractions at Non-Reactor Nuclear Facilities" (reaffirmation of ANSI/ANS-5.10-1998)

ANSI/ANS-6.1.2-2013, "Group-Averaged Neutron and Gamma-Ray Cross Sections for Radiation Protection and Shielding Calculations for Nuclear Power Plants" (revision of ANSI/ANS-6.1.2-1989)

ANSI/ANS-10.7-2013, "Non-Real Time, High-Integrity Software for the Nuclear Industry: Developer Requirements" (new standard)

Active Standards/Projects:

ANS-5.1, "Decay Heat Power in Light Water Reactors" (revision of ANSI/ANS-5.1-2005)

ANS-6.4.2, "Specification for Radiation Shielding Materials" (revision of ANSI/ANS-6.4.2-2006)

ANS-6.4.3, "Gamma-Ray Attenuation Coefficients & Buildup Factors for Engineering Materials" (historical revision of ANSI/ANS-6.4.3-1991 – proposed new standard)

ANS-6.6.1, "Calculation and Measurement of Direct and Scattered Gamma Radiation from LWR Nuclear Power Plants" (revision of ANSI/ANS-6.6.1-1987; R2007)

ANS-10.8, "Non-Real Time, High Integrity Software for the Nuclear Industry-User Requirements" (proposed new standard)

ANS-19.1, "Nuclear Data Sets for Reactor Design Calculations" (revision of ANSI/ANS-19.1-2002; R2011)

ANS-19.5, "Requirements for Reference Reactor Physics Measurements" (historical revision of ANS-19.5-1995 – proposed new standard)

ANS-19.11, "Calculation and Measurement of the Moderator Temperature Coefficient of Reactivity for Pressurized Water Reactors" (revision of ANSI/ANS-19.11-1997; R2011)

Mathematics & Computations Subcommittee (ANS-10)

Scope:

The scope of the Mathematics & Computations Subcommittee includes the development of standards which will promote effective utilization and enhance the reliability of computer programs throughout the nuclear community. The intent of such standards is to improve the ease of use, facilitate the exchange, and simplify the conversion of programs.

Membership:

OPEN, Chair
Mark Baird, Radiation Safety Information Computational Center
Phillip Ellison, GE-Hitachi
Byron Frank, Westinghouse Electric Company

Keith A. Morrell, Savannah River Nuclear Solutions
Yuri Orechwa, U.S. Nuclear Regulatory Commission
Edward (Ted) Quinn, Longenecker and Associates
Robert Singleterry, National Aeronautics and Space Administration
Charlie Sparrow, Mississippi State University

Mathematics & Computations Subcommittee manages the following active projects and current standards:

ANSI/ANS-10.2-2000; R2009, "Portability of Scientific and Engineering Software" (revision of ANSI/ANS-10.2-1988)

Scope:

This standard provides recommended programming practices and requirements to facilitate the portability of computer programs prepared for scientific and engineering computations.

Membership:

Robert Singleterry, Chair, National Aeronautics and Space Administration
Balance of membership OPEN

Status: A reaffirmation was approved by ANSI on 8/14/2009. No activity in 2013.

ANS-10.3, "Documentation of Computer Software" (historical revision of ANSI/ANS-10.3-1995 – proposed new standard)

Scope:

This standard addresses the documentation of computer software prepared for scientific and engineering applications.

Membership:

Edward (Ted) Quinn, Chair, Longenecker and Associates

Status: The intent is to start a revision to this withdrawn standard. Working group members need to be recruited. No activity in 2013.

ANSI/ANS-10.4-2008, "Verification and Validation of Non-Safety Related Scientific and Engineering Computer Programs for the Nuclear Industry" (historical revision of ANSI/ANS-10.4-1987; R1998 – new standard)

Scope:

This standard provides requirements for the verification and validation (V&V) of scientific and engineering computer programs developed for use by the nuclear industry.

Membership:
Andrew Smetana, Chair, Savannah River National Laboratory; Jennifer Manneschmidt, Oak Ridge National Laboratory; Keith Morrell, Westinghouse Savannah River Company

Status: This standard was approved 10/28/2008. No current activity in 2013.

ANSI/ANS-10.5-2006, R2011, "Accommodating User Needs in Scientific and Engineering Computer Software Development" (historical revision of ANSI/ANS-10.5-1994 – new standard)

Scope:
This standard presents criteria for accommodating user needs in the preparation of computer software for scientific and engineering applications.

Membership:
Andrew Smetana, Chair, Savannah River National Laboratory; Jennifer Manneschmidt, Oak Ridge National Laboratory; Keith Morrell, Westinghouse Savannah River Company

Status: No activity in 2013.

ANSI/ANS-10.7-2013, "Non-Real Time, High Integrity Software for the Nuclear Industry: Developer Requirements" (new standard)

Scope:
This standard addresses rigorous, systematic development of high integrity, non-real time safety analysis, design, simulation software which includes calculations or simulations that can have critical consequences if errors are not detected, but that are so complex that typical peer reviews are not likely to identify errors. This may include nuclear design and performance codes, codes used to assign safety classification levels to systems, structures and components at nuclear facilities, computational fluid dynamics or structural mechanics codes, complex Monte Carlo simulations, radiation dosimetry analysis codes, and nuclear medical physics analytical codes.

Membership:
OPEN, Chair, National Security Technologies; Mark Baird, Oak Ridge National Laboratory; Forrest Brown, Los Alamos National Laboratory; Phillip Ellison, GE-Hitachi; Paul Hulse, Sellafield Ltd.; Keith A. Morrell, Westinghouse Savannah River Company; Vincent S. Penkrot, Westinghouse Electric Company; Bradley T. Rearden, Oak Ridge National Laboratory; William J. Rider, Sandia National Laboratories; J. R. Shultz, U.S. Department of Energy; Shivaji S. Seth, U.S. Department of Energy; Andrew O. Smetana, Savannah River National Laboratory; Jin Yan, Westinghouse Electric Company

In addition, substantial contributions towards the development of earlier drafts of this proposed standard were received from the following: Toni Austin, U.S. Department of Energy; Brett Dooies, GE-Hitachi; Jim Fawks, GE-Hitachi; Ahmad Haidari, ANSYS; Sherry Hardgrave, Y-12 Site Office, National Nuclear Security Administration; Edwin Harvego, Idaho National Laboratory; Harvey S.

Hopkins, Lawrence Livermore National Laboratory; Jed Jordan, GE-Hitachi; Bernadette Kirk, Oak Ridge National Laboratory; Timothy M. Lloyd, BNFL Fuel Solutions; Jennifer Manneschmidt, Oak Ridge National Laboratory; Yuri Orechwa, U.S. Nuclear Regulatory Commission; Julio Pardo, Savannah River Technology Center; David Peercy, Sandia National Laboratories; Gregory Pope, Lawrence Livermore National Laboratory; and R. C. Singleterry, NASA Langley Research Center; Robert Singleterry, NASA Langley Research Center; Charles Sparrow, Consultant

Status: ANSI approval was received 3/18/2013 and publication followed. Charles Martin stepped down as working group chair. A new chair will be sought when maintenance needed.

ANS-10.8, "Non-Real Time, High-Integrity Software for the Nuclear Industry: User Requirements" (proposed new standard)

Scope:

This standard provides minimum requirements for assurance that high-integrity design and analysis software developed for use by the nuclear industry meets state of the practice expectations for quality when employed by end users to solve complex physical problems. Final validation of such software for its intended use is ultimately the responsibility of the user. The developer is responsible for validation of the software over the parameter space defined by the developer; however, the end user may extrapolate beyond the intended validation envelope providing additional benchmarks or appropriate non-dimensional scaling analysis. The requirements in this standard may be graded or tailored for less significant applications than high-integrity software. The intent is to set a minimum level of quality assurance and critical technical process requirements to satisfy due diligence.

Membership:

Open, Chair; Forrest Brown, Los Alamos National Laboratory; Phillip Ellison, GE-Hitachi; Paul Hulse, Sellafield Ltd.; Keith A. Morrell, Savannah River Nuclear Solutions; Vincent S. Penkrot, Westinghouse Electric Company; Bradley T. Rearden, Oak Ridge National Laboratory; William J. Rider, Sandia National Laboratories; Shivajli S. Seth, U.S. Department of Energy; J. R. Shultz, U.S. Department of Energy; Andrew O. Smetana, Savannah River Nuclear Solutions

Status: This standard has been initiated to complement ANS-10.7-2013, "Non-Real Time, High-Integrity Software Industry: Developer Requirements." Charles Martin resigned as working group chair. A new chair is being sought.

ANSI/ANS-41.5-2012, "Verification and Validation of Radiological Data for Use in Waste Management and Environmental Remediation" (new standard)

Scope:

This standard 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.

Membership:
Thomas L. Rucker, Co-Chair, SAIC; Saleem Salaymeh, Co-Chair, Individual; James E. Chambers, Fluor; Pamela Greenlaw, US DOE; John Griggs, EPA; Chung King Liu, DOE; David E. McCurdy, Individual; Dennis Poyer, U.S. Army CHPPM; Ann Rosecrance, Core Laboratories;

Status: This standard was approved by ANSI on 2/15/2012. No activity needed.

Reactor Physics Subcommittee (ANS-19)

Membership:
Dimitrios Cokinos, Chair, Brookhaven National Laboratory
Michaele Brady Rapp, Pacific Northwest National Laboratory
Mark DeHart, Idaho National Laboratory
Ian Gauld, Oak Ridge National Laboratory
Alireza Haghighat, Virginia Tech Research Center
Robert Little, Los Alamos National Laboratory
Russell Mosteller, Individual
Charles Rombough, CTR Technical Services, Inc.
Benjamin Rouben, Individual
William Wilson, Individual

Reactor Physics Subcommittee manages the following projects and current standards:

ANSI/ANS-5.1-2005, "Decay Heat Power in Light Water Reactors" (historical revision of ANSI/ANS-5.1-1994 – new standard)

Scope:
This standard sets forth values for the decay heat power from fission products and ^{239}U and ^{239}Np following shutdown of light water reactors containing ^{235}U, ^{238}U, and plutonium. The decay heat power from fission products is presented in tables and equivalent analytical representations. Methods are described that account for the reactor operating history, for the effect of neutron capture in fission products, and for assessing the uncertainty in the resultant decay heat power. Decay heat power from other actinides and activation products in structural materials, and fission power from delayed neutron-induced fission, are not included in this standard.

Membership:
Ian Gauld, Chair, Oak Ridge National Laboratory; Mourad Aissa, U.S. Nuclear Regulatory Commission; David Carpenter, Bettis Atomic Power Laboratory; Ren-Tai Chiang, AREVA; Michaele Brady Raap, Pacific Northwest National Laboratory; Arnold Fero, Westinghouse Electric Company, LLC; Jun-ichi Katakura, Japan Atomic Energy Agency; Ed Knuckles, Florida Power and Light; Holly Trellue, Los Alamos National Laboratory; Sylvia Wang, Westinghouse; William Wilson, Los Alamos National Laboratory; Tadashi Yoshida, Musashi Institute of Technology; Dmitri Ziabletsev, AREVA

Status: Approved by ANSI 4/1/2005. Work continued on the draft.

ANSI/ANS-19.1-2002; R2011, "Nuclear Data Sets for Reactor Design Calculations" (revision of ANSI/ANS-19.1-1983; R1989)

Scope:

This standard identifies and describes the specifications for developing, preparing, and documenting nuclear data sets to be used in reactor design calculations. The specifications include (a) criteria for acceptance of evaluated nuclear data sets, (b) criteria for processing evaluated data and preparation of processed continuous data and averaged data sets (c) identification of specific evaluated, processed continuous, and averaged data sets that meet these criteria for specific reactor types.

Membership:

Robert Little, Chair, Los Alamos National Laboratory; Arzu Alpan, Westinghouse; Steve Baker, Transware Enterprises; Dimitrios Cokinos, BNL; Dermott Cullen, Individual; Michael Dunn, ORNL; Mike Garland, ORNL; Donald Harris, RPI - Retired; Michal Herman, BNL; Albert Kahler, LANL; Russell Mosteller, Individual; Benjamin Rouben, AECL; Mike Zerkle, Bettis

Status: Reaffirmation received ANSI approval 6/17/2011. Progress continues to be made on the draft.

ANSI/ANS-19.3-2011, "Steady-State Neutronics Methods for Power Reactor Analysis" (revision of ANSI/ANS-19.3-2005)

Scope:

This standard provides guidance for performing and validating the sequence of steady-state calculations leading to prediction, in all types of commercial nuclear reactors, of (1) reaction-rate spatial distributions; 2) reactivity; 3) change of isotopic compositions with time. The standard provides 1) guidance for the selection of computational methods; 2) criteria for verification and validation of calculational methods used by reactor core analysts; 3) criteria for evaluation of accuracy and range of applicability of data and methods; 4) requirements for documentation of the preceding.

Membership:

Benjamin Rouben, Chair, 12 & 1 Consulting; Steven Baker, Transware Enterprises; Ren-Tai Chiang, AREVA; Dimitrios Cokinos, Brookhaven National Laboratory; Ronald Ellis, Oak Ridge National Laboratory; Donald Harris, Rensselaer Polytechnic Institute-retired; Greg Hobson, AREVA NP; Ken Kozier, Atomic Energy of Canada Limited; Russell Mosteller, Individual; Eledor Nichita, University of Ontario Institute of Technology; Scott Palmtag, General Electric; Charles Rombough, CTR Technical Services; Wei Shen, Atomic Energy of Canada; Robert St. Clair, Duke Energy; Scott Thomas, Duke Power; Peter Yarsky, U.S. Nuclear Regulatory Commission

Status: Revision received ANSI approval 8/26/2011 with a new title. The standard should be revised or reaffirmed by 2015. The working group has not started to work on this. A new working group chair is currently being sought, as the present chair has indicated his intention to retire from the position.

ANSI/ANS-19.3.4-2002; R2008, "The Determination of Thermal Energy Deposition Rates in Nuclear Reactors" (revision of ANSI/ANS-1976; R1983; R1989)

Scope:

It is the purpose of this standard to provide criteria for 1) determination of the energy allocation among the principal particles and photons produced in fission, both prompt and delayed; 2) adoption of appropriate treatment of heavy charged particle and electron slowing down in matter; 3) determination of the spatial energy deposition rates resulting from the interactions of neutrons; 4) calculation of the spatial energy deposition rates resulting from the various interactions of photons with matter; and 5) presentation of the results of such computations, including verification of accuracy and specification of uncertainty. This standard addresses the energy generation and deposition rates for all types of nuclear reactors where the neutron reaction rate distribution and photon and beta emitter distributions are known. Its scope is limited to the reactor core, including blanket zones, control elements and core internals, pressure vessel, and the thermal and biological shielding.

Membership:

Dimitrios Cokinos, Chair pro tem, Brookhaven National Laboratory

Status: A reaffirmation received ANSI approval 10/31/2008. Working group members and a permanent chair are being sought.

ANS-19.4, "A Guide for Acquisition and Documentation of Reference Power Reactor Physics Measurements for Nuclear Analysis Verification" (historical revision of ANSI/ANS-19.4-1976; R1983; R1989; R2000 – proposed new standard)

Scope:

This standard applies to measurements of reactor parameters in light water power reactors that are intended to serve as reference measurements to be used in evaluating reactor physics computational procedures. It includes: identification of the types of parameters of interest as reference measurements; a brief description of test conditions and experimental data required for such reference measurements; identification of problems and concerns which may affect the accuracy or interpretation of the data; and criteria to be used in documenting the results of reference measurements.

Membership:

Dimitrios Cokinos, Chair pro tem, Brookhaven National Laboratory

Status: Working group members and a permanent chair are being sought to initiate a historical revision.

ANS-19.5, "Requirements for Reference Reactor Physics Measurements" (historical revision of ANSI/ANS-19.5-1995 – proposed new standard)

Scope:

This standard provides criteria for the qualification of reference reactor physics measurements obtained from subcritical (including non-multiplying), critical and experiments performed in any nuclear facility for verification of nuclear design and analysis methods. It also provides criteria for documentation of reference data and review of proposed reference reactor physics data to ensure compliance with this standard. The burden falls upon the user to determine the applicability and relevance of such experimental data to a given reactor design.

Membership:

Mark DeHart, Chair, Idaho National Laboratory; Anthony Attard, U.S. Nuclear Regulatory Commission; John Bess, Idaho National Laboratory; Blair Briggs, Idaho National Laboratory; Jeffrey Brown, Westinghouse; James Felty, Science Applications International Corporation; Sedat Goluoglu, Oak Ridge National Laboratory; Louis Grobmyer, Westinghouse; Albert Hanson, Brookhaven National Laboratory; Gary Harms, Sandia National Laboratories; Germina Ilas, Oak Ridge National Laboratory; James Parry, Idaho National Laboratory; Trent Primm, Primm Consulting; Alan Wells, Consultant; Won Sik Yang, Purdue University

Status: A PINS was approved and submitted to ANSI on 11/6/2012 for a resurrection of historic standard ANSI/ANS-19.5-1995. The working group has been reformed and the draft is in development.

ANSI/ANS-19.6.1-2011 "Reload Startup Physics Tests for Pressurized Water Reactors" (revision of ANSI/ANS-19.6.1-2005)

Scope:

This standard applies to the reactor physics tests that are performed following a refueling or other core alteration of a 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.

This standard specifies the minimum acceptable startup reactor physics test program to determine if the operating characteristics of the core are consistent with the design predictions, which provides assurance that the core can be operated as designed. This standard does not address surveillance of reactor physics parameters during operation or other required tests such as mechanical tests of system components (for example, the rod drop time test), visual verification requirements for fuel assembly loading, or the calibration of instrumentation or control systems (even though these tests are an integral part of an overall program to ensure that the core behaves as designed).

Membership:

Charles Rombough, Chair, CTR Technical Services, Inc.; Paul Adam, Wolf Creek NOC; Tony Attard, U.S. NRC; Robert Borchert, Dominion Nuclear Connecticut; Jason Dever, AREVA; Mark Eckenrode, AREVA; Fred Gershkoff, Southern California Edison; Louis Grobmyer, Westinghouse Electric, LLC; Dan Kelley, FENOC; Moussa Mahgerefteh, Exelon Corporation; Michael Presnell, Duke Power Company; Paul Rohr, Westinghouse Electric Co.; Ken Sahadewan, Exelon Nuclear; John Singleton, Constellation Energy; Carl Stafford, Arizona Public Service Co.; Daniel Wellbaum, Duke Energy

Status: The current standard was approved by ANSI on 1/13/2011. A response to an inquiry on this standard was issued at the end of 2012. No activity has occurred since then.

ANS-19.8, "Fission Product Yields for 235U, 238U, and 239P" (proposed new standard)

Unapproved Scope:

This standard provides a reference set of fission yield data for thermal and fast neutron-induced fission of ^{233} U, ^{235}U, ^{239}Pu, and ^{241}Pu; fast neutron-fission of ^{232}Th, ^{238}U, and ^{240}PU; and spontaneous fission of ^{252}CF. The standard includes an extensive compilation of mass chain yields and uncertainties in tabular form. This new standard is particularly important in the characterization of radioactive wastes, predicting radiation source terms production of delayed neutrons, reactor spectra, burnup calculations, and various dosimetry applications including medical applications.

Membership:

Dimitrios Cokinos, Chair pro tem, Brookhaven National Laboratory; William Wilson, Los Alamos National Laboratory; Robert Perry, Instituto Nacional de Invest. Nuclear; Michaele Brady Raap, Pacific Northwest National Laboratory

Status: ANS-19.8 was previously designated ANS-5.2. A permanent chair is being sought to initiate this project. A PINS will be the first task.

ANS-19.9, "Delayed Neutron Parameters for Light Water Reactors" (proposed new standard)

Scope:

This standard provides energy-dependent delayed neutron yield and decay data for Light Water Reactor design and control. The standard addresses the identification and characterization of fission products leading to delayed neutron emission; the total delayed neutron yield as a function of energy for U-233, U-235, U-238 and Pu-239; and fractions associated with Individual emitters, half-lives and spectra for the classical group representation of delayed neutron data.

Membership:

Michaele Brady Raap, Chair, Pacific Northwest National Laboratory
Balance OPEN

Status: A skeleton of the standard has been completed. A working group of active participants is needed to move forward.

ANSI/ANS-19.10-2009, "Methods for Determining Neutron Fluence in BWR and PWR Pressure Vessel and Reactor Internals" (new standard)

Scope:

This standard provides criteria for performing and validating the sequence of calculations required for the prediction of the fast neutron fluence t in the reactor vessel. Applicable to PWR and BWR plants the standard addresses flux attenuation from the core through the vessel to the cavity and provides criteria for generating cross sections, spectra, transport and comparisons with in- and ex-vessel measurements, validation, uncertainties and flux extrapolation to the inside vessel surface.

Membership:
Alireza Haghighat, Chair, University of Florida; John Carew, Secretary, Brookhaven National Laboratory; James Adams, Individual; Stanwood Anderson, Westinghouse; Steven Baker, Transware Enterprises; Richard Cacciapouti, Duke Engineering; Robert Little, LANL; Moussa Mahgerefteh, Exelon Corp; Yuri Orechwa, U.S. Nuclear Regulatory Commission; John Wagner, ORNL; Tuck Worsham, AREVA

Status: The current standard was approved by ANSI on 2/24/09. No activity in 2013. Alireza Haghighat accepted the chair position.

ANSI/ANS-19.11-1997; R2002; R2011, "Calculation and Measurement of the Moderator Temperature Coefficient of Reactivity for Water Moderated Power Reactors" (new standard)

Scope:
This standard provides guidance and specifies criteria for determining the MTC in pressurized water reactors. Measurement of the isothermal temperature coefficient of reactivity (ITC) at hot zero power (HZP) conditions is covered in ANSI/ANS-19.6.1-2005, "Reload Startup Physics Tests for Pressurized Water Reactors." This standard therefore addresses the calculation of the ITC at HZP and the calculation and measurement of the MTC at power. This standard addresses the calculation and measurement of the MTC only in PWRs, because that is the only type of power reactor currently sited in the United States for which measurement of the MTC is required.

Membership:
Dimitrios Cokinos, Chair pro tem, Brookhaven National Laboratory; Steven Baker, Transware Enterprises; Robert Borland, First Energy Nuclear Operating Company; James Brittingham, Palo Verde Nuclear Generating Station; Doug Brown, AREVA; Robert Hall, Dominion Energy; Michael Todosow, Brookhaven National Laboratory

Status: Reaffirmation received ANSI approval 6/17/2011. The title of the next revision will be changed to "Calculation and Measurement of the Moderator Temperature Coefficient of Reactivity for Pressurized Water Reactors" reflecting a slightly revised scope. Robert St. Clair has stepped down as working group chair. Some of the conversion errors in the equations were fixed. The draft will be sent to the Reactor Physics Subcommittee for review shortly.

ANS-19.12, "Nuclear Data for the Production of Radioisotope" (proposed new standard)

Scope:
This standard establishes criteria for developing evaluated neutron cross section and branching ratio data for isotope production pathways for fast and thermal reactor systems, providing the data needed to calculate production of the desired medical and other isotopes and associated impurities.

Membership:
Dimitrios Cokinos, Chair pro tem, Brookhaven National Laboratory; Steve Binney, Oregon State University–retired; Ken Krane, Oregon State University–retired; Saed Mirzadeh, Oak Ridge National Laboratory; Frank Schmittroth, Westinghouse; Chuck Alexander; Oak Ridge National Laboratory

Status: PINS approved and submitted to ANSI in 2010. There was no activity in 2013. Project is in need of a permanent chair.

Shielding Subcommittee (ANS-6)

Scope:
The purpose of this committee is to establish standards in connection with radiation shields, radiation analysis, and radiation protection insofar as it affects design of structures or equipment containing or near radiation sources, to provide shielding information to other standards groups, and to prepare and make available recommended related nuclear data and test problem solutions.

Membership:
Charlotta Sanders, Chair, University of Las Vegas - Nevada
F. Arzu Alpan, Westinghouse Electric Company, LLC
Richard Amato, Bechtel Marine Propulsion Corporation
Paul Bergstrom, National Institute of Standards and Technology
Donald Duziak, Los Alamos National Laboratory
Mukesh Gupta, URS Safety Management Solutions
Nolan Hertel, Georgia Institute of Technology
Brian Hinderliter, Virginia Commonwealth University
Steven Nathan, Savannah River Nuclear Institute
Jeffrey C. Ryman, URS Safety Management Solutions
Ali A. Simpkins, Dade Moeller & Associates *(HPS Liaison)*
R. Michael Westfall, Oak Ridge National Laboratory *(At-Large Member)*

Shielding Subcommittee (ANS-6) Report
The Shielding Subcommittee met at the ANS Winter meeting. With the establishment of the Safety & Radiological Analyses (SRA) Consensus Committee, ANS-6 activities fall under the shielding track along with ANS-5.4 and ANS-5.10. Future plans include proposing shielding standards for submittal to the International Organization of Standardization (ISO) for consideration as international standards.

The Shielding Subcommittee manages the following active and current standards:

ANSI/ANS-5.4-2011, "Method for Calculating the Fractional Release of Volatile Fission Products from Oxide Fuel" (historical revision of ANSI/ANS-5.4-1982 – new standard)

Scope:
This standard provides an analytical method for calculating the release of volatile fission products from oxide fuel pellets during normal reactor operation. When used with nuclide yields, this method will give the so-called "gap activity," which is the inventory of volatile fission products that

could be available for release from the fuel rod if the cladding were breached. The standard considers high-temperature (up to the melting point) and low-temperature (where temperature-independent processes dominate) releases and distinguishes between short-halflife (halflife less than one year) and long-halflife (halflife greater than one year) nuclides. This standard requires that releases for nuclides of interest be calculated with both the high-temperature and the low-temperature models, and the larger of the two calculated releases is to be taken as the result.

Membership:
Carl Beyer, Chair, Pacific NW National Laboratory; A. J. Turnbul, Vice Chair, Consultant; Daniel Baron, EDF - France; Michelle Billaux, AREVA; Paul Clifford, U.S. Nuclear Regulatory Commission; Nayem Jahingir, GNF; Erik Kolstad, Institutt for Energiteknikk; Brent Lewis, Royal Military College of Canada; Yun Long, Westinghouse; Robert Montgomery, Anatech; Chuck Patterson, GNF; C.S. Rim, Consultant; John Voglewede, U.S. Nuclear Regulatory Commission; NRC; Bob Weiner, K W Consulting; S.L. Wu, U.S. Nuclear Regulatory Commission

Status: Received ANSI approval on 5/19/2011. No activity in 2013.

ANSI/ANS-5.10-1998; R2006; R2013, "Airborne Release Fractions at Non-Reactor Nuclear Facilities" (new standard)

Scope:
This standard provides criteria for defining Airborne Release Fractions (ARFs) for radioactive materials under accident conditions (excluding nuclear criticalities) at non-reactor nuclear facilities. The criteria in this standard provide requirements for selecting ARFs based on the calculated or assumed forms of radioactive material released. This standard may be applied to determine the ARFs for certain applicable reactor plant events for which alternative methodologies are not mandated by regulatory requirements. Because the predominant physical forms of radioactive materials in non-reactor facilities are solids and liquids, the standard focuses on these forms. Criteria are also provided for gases and materials that can be converted into the form of a vapor.

Membership:
Mukesh Gupta, Chair, URS-SMS; Gerard Couture, Westinghouse; Terry Foppe, Foppe & Associates; Derek Gordon, Los Alamos National Laboratory; Geoffrey Kaiser, Science Applications International Corporation (SAIC); Robert Link, AREVA; Jofu Mishima, Consultant; Lon Paulson, General Electric; David Pinkston, Lawrence Livermore National Laboratory; Louis Restrepo, Omicron; Al Wooten, URS

Status: Reaffirmation approved by ANSI 1/15/2013.

ANS-6.1.1, "Neutron and Gamma-Ray Fluence-To-Dose Factors" (historical revision of ANSI/ANS-6.1.1-1991 – proposed new standard)

Old Scope:

This standard presents data recommended for computing the biologically relevant dosimetric quantity in neutron and gamma-ray radiation fields. Specifically, this standard is intended for use by shield designers to calculate effective dose equivalent. Values are given for effective dose equivalent per unit fluence for neutron energies from 1eV to 14 MeV and for gamma-ray energies from 0.01 to 12 MeV. Establishing maximum permissible exposure limits is outside the scope of this standard.

Membership:

Paul Bergstrom, Co-chair, National Institute of Standards and Technology; Nolan Hertel, Co-chair, Georgia Institute of Technology

Status: This standard was withdrawn in 2001. Paul Bergstrom was added as a co-chair. The working group chairs are considering options for a revision.

ANSI/ANS-6.1.2-2013, "Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants" (revision of ANSI/ANS-6.1.2-1999; R2009)

Scope:

This standard provides information on acceptable evaluated nuclear data and group-averaged neutron and gamma-ray cross section libraries based on the energy range and materials of importance in nuclear radiation protection and shielding calculations for nuclear power plants.

Membership:

Arzu Alpan, Chair, Westinghouse Electric Company; James Adams, Corvus Integration, Inc.; Stanwood Anderson, Westinghouse Electric Company; John Carew, Brookhaven National Laboratory; Juan-Luis Francois, UNAM-Mexico; Patrick Griffin, Sandia National Laboratories; Alireza Haghighat, Virginia Tech; Robert Little, Los Alamos National Laboratory; Yuri Orechwa, U.S. Nuclear Regulatory Commission; Jeffrey Ryman, URS Corporation; Mark Williams, Oak Ridge National Laboratory

Status: The standard was approved by ANSI on 8/28/2013. The revision of this standard was approved by the subcommittee and submitted for formal ballot to its consensus committee. The consensus committee ballot was successful enabling consensus to be declared and the standard to be approved by ANSI on August 28, 2013.

ANSI/ANS-6.3.1-1987; R1998; R2007, "Program for Testing Radiation Shields in Light Water Reactors (LWR)" (revision of ANSI/ANS-6.3.1-1980)

Scope:

This standard describes a test program to be used in evaluating biological radiation shielding in nuclear reactor facilities under normal operating conditions including anticipated operational occurrences. The program encompasses examining and testing to be performed before startup, during startup, and testing subsequent to the startup phase. Post startup tests are required for the shielded components which do not contain sufficient radioactivity during the startup phase to allow valid testing. Shielding of these components is to be tested when radiation sources develop or are introduced into sufficient strength to allow meaningful measurements. Post startup shield tests are also required whenever radioactive or potentially radioactive equipment which could affect the adequacy of the installed shielding is introduced into the plant or relocated within the plant, or when previously tested shielding has been modified. One special category of post start-up testing is the testing of shielding during refueling operations.

Membership:

OPEN

Status: Reaffirmation received ANSI approval 4/20/07. No current activity. A working group chair is being sought.

ANSI/ANS-6.4-2006, "Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants" (revision of ANSI/ANS-6.4-1997; R2004)

Scope:

This standard contains methods and data needed to calculate the concrete thickness required for radiation shielding in nuclear power plants. Where possible, specific recommendations are made regarding radiation attenuation calculations, shielding design, and standards of documentation. The standard provides guidance to architect engineers, utilities, and reactor vendors who are responsible for the shielding design of stationary nuclear plants. This standard does not consider sources of radiation other than those associated with nuclear power plants. It also excludes considerations of economic aspects of shielding design.

Concrete is a mixture of materials, the exact proportions of which will differ from application to application. This standard includes a discussion of the nature of concrete, emphasizing those variable aspects of the material which are important to the shield designer. The document discusses methods of analysis and the shielding input data appropriate to each method. Applications of the analytical methods are given, including bulk transport, radiation heating, streaming, and reflection problems.

Membership:
OPEN, Chair; Richard Donahue, Lawrence Berkeley National Laboratory; Richard Faw, Individual; Christopher Graham, AmerenUE Callaway Plant; Stanley Haynes, Sandia National Laboratories; Timothy Lloyd, Energy Solutions; Jason Olson, Black & Veatch Corporation; Robert Roussin, Individual; Kenneth Shultis, Kansas State University; Karl Warkentin, Individual

Status: This standard received ANSI approval 9/29/2006. No activity in 2013. A chair is needed to maintain this standard.

ANSI/ANS-6.4.2-2006, "Specification for Radiation Shielding Materials" (revision of ANSI/ANS-6.4-2-1985; R1997; R2004)

Scope:
This standard sets forth physical and nuclear properties that shall be reported by the supplier as appropriate for a particular application in order to form the basis for the selection of radiation shielding materials.

Membership:
Steven Nathan, Chair, Savannah River Nuclear Solutions; Peter Caracappa, Rensselaer Polytechnic Institute; Stanley Haynes, Sandia National Laboratories; Brian Hinderliter, Virginia Commonwealth University; Ahmad Ibrahim, Fusion Technology Institute; Timothy Lloyd, Westinghouse Electric Company; Bill McTigue, URS Nuclear Safety Services; Kathryn Robertson-DeMers, Spectrum Technical Services, Inc.; Kenneth Shultis, Kansas State University; Nancy Willoughby, New York City Department of Design & Construction

Status: This standard received ANSI approval 9/28/2006. A PINS was prepared for a revision of this standard and submitted to ANSI in 2012. The working group is developing the draft.

ANS-6.4.3, "Gamma-Ray Attenuation Coefficients & Buildup Factors for Engineering Materials" (historical revision of ANSI/ANS-6.4-3-1991 – proposed new standard)

Scope:
This standard provides evaluated gamma-ray elemental attenuation coefficients and single material buildup factors for selected engineering materials for use in shielding calculations.

Membership:
Jeffrey C. Ryman, Chair, URS Safety Management Solutions; Donald Dudziak, Co-Chair, Individual; F. Arzu Alpan, Westinghouse Electric, LLC; Adam Davis, Los Alamos National Laboratory; Keith Eckerman, Oak Ridge National Laboratory; Richard Faw, Kansas State University, Emeritus; Jack Higginbotham, Oregon State University; Brian Hinderliter, Virginia Commonwealth University; Essam A. Hussein, University of New Brunswick; Darby Kimball, Bechtel Systems & Infrastructure, Inc.; Irina Popova, Oak Ridge National Laboratory; Thomas Rosener, TASC, Inc.; Yukio Sakamoto, Japan Atomic Energy Agency; Charlotta E. Sanders, University of Las Vegas/Sanders Engineering; Sylvia Wang, Westinghouse Electric, LLC

Status: The Project Initiation Notification System (PINS) form for a historical revision of ANSI/ANS-6.4.3-1991 was approved and submitted to ANSI on 3/15/2012. Work continues on the draft.

ANSI/ANS-6.6.1-1987; R1998; R2007, "Calculation and Measurement of Direct and Scattered Gamma Radiation from LWR Nuclear Power Plants" (revision of ANSI/ANS-6.6.1-1979)

Scope:

This standard defines calculational requirements and discusses measurement techniques for estimates of dose rates near light water reactor (LWR) nuclear power plants due to direct and scattered gamma-rays from contained sources onsite. Onsite locations outside plant buildings and locations in the offsite unrestricted area are considered. All sources that contribute significantly to dose rates are identified and methods for calculating the source strength of each are discussed. Particular emphasis is placed on 16N sources as they are significant sources of direct and scattered radiation for boiling water reactors (BWR). The standard specifically excludes radiation from gaseous and liquid effluents. The standard describes the considerations necessary to compute dose rates, including component self-shielding, shielding afforded by walls and structures, and scattered radiation. The requirements for measurements and data interpretation of measurements are given. The standard includes normal operation and shutdown conditions but does not address accident or normal operational transient conditions.

Membership:

Dick Amato, Chair, Individual; Joseph John Bevelacqua, Bevelacqua Resources; Peter Caracappa, Rensselaer Polytechnic Institute; Jianwei Chen, Westinghouse Electric Co.; Brian Hinderliter, Virginia Commonwealth University; Sylvia Wang, Westinghouse Electric Co.

Status: The ANS-6.6.1 Working Group completed a review of the subject standard. Proposed revisions were submitted in an annex accompanying a completed PINS for a revision of the standard. The PINS was approved and submitted to ANSI on 12/4/2013. The proposed revisions include: 1) corrections to editorial errors, 2) updated terminology and 3) update to the tables and figures by folding in gamma dose rate results generated by the working group using the MCNP5 radiation transport Monte Carlo code.

Safety and Radiological Analyses (SRA) Consensus Committee Organizational Chart

Chair: Andrew O. Smetana Vice Chair: Abraham Weitzberg

Shielding (ANS-6)	Mathematics & Computations (ANS-10)	Reactor Physics (ANS-19)
Chair: Charlotta Sanders	Chair: OPEN	Chair: Dimitrios Cokinos
2 = Active Project	2 = Active Projects	2 = Active Projects
7 = Current Standards	5 = Current Standards	7 = Current Standards
ANS-5.4-2011 Method for Calculating the Fractional Release of Volatile Fission Products from Oxide Fuel Approved 5/19/2011	ANS-10.2-2000 (R2009) Portability of Scientific and Engineering Software RF 8/14/2009	ANS-5.1-2005 Decay Heat Power in Light Water Reactors Approved 4/1/2005
ANS-5.10-1998 (R2013) Airborne Release Fractions at Non-Reactor Nuclear Facilities RF 1/15/2013	ANS-10.3 Documentation of Computer Software	ANS-19.1-2002 (R2011) Nuclear Data Sets for Reactor Design Calculations RF 6/17/2011
ANS-6.1.1 Neutron and Gamma-Ray Fluence-To-Dose Factors	ANS-10.4-2008 Verification and Validation of Non-Safety-Related Scientific and Engineering Computer Programs for the Nuclear Industry Approved 10/28/2008	ANS-19.3-2011 Determination of Steady-State Neutron Reaction-Rate Distributions and Reactivity of Nuclear Power Reactors RF 10/31/2011
ANS-6.1.2-2013 Group-Averaged Neutron and Gamma-Ray Cross Sections for Radiation Protection and Shielding Calculations for NPPs Approved 8/28/2013	ANS-10.5-2006 (R2011) Accommodating User Needs in Scientific and Engineering Computer Software Development RF 11/17/2011	ANS-19.3.4-2002 (R2008) The Determination of Thermal Energy Deposition Rates in Nuclear Reactors RF 10/31/2008
ANS-6.3.1-1987 (R2007) Program for Testing Radiation Shields in Light Water Reactors (LWR) RF 4/20/2007	ANS-10.7-2013 Non-Real-Time, High Integrity Software for the Nuclear Industry-developer requirements Approved 3/18/2013	ANS-19.4 Acquisition and Documentation of Reference Power Reactor Physics Measurements for Nuclear Analysis Verification
ANS-6.4-2006 Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants Approved 9/29/2006	ANS-10.8 Non-Real Time, High Integrity Software for the Nuclear Industry-user requirements	ANS-19.5 Requirements for Reference Reactor Physics Measurements
ANS-6.4.2-2006 Specification for Radiation Shielding Materials Approved 9/28/2006	ANS-41.5-2012 Verification and Validation of Radiological Data for Use in Waste Management and Environmental Remediation Approved 2/15/2012	ANS-19.6.1-2011 Reload Startup Physics Tests for Pressurized Water Reactors Approved 1/13/2011
ANS-6.4.3 Gamma-Ray Attenuation Coefficients & Buildup Factors for Engineering Materials		ANS-19.8 Fission Product Yields for 235U, 238U, and 239P
ANS-6.6.1-1987 (R2007), Calculation and Measurements of Direct and Scattered Gamma Radiation from LWR NPPs RF 3/5/2007		ANS-19.9 Delayed Neutron Parameters for Light Water Reactors
		ANS-19.10-2009 Methods for Determining Neutron Fluence in BWR and PWR Pressure Vessel and Reactor Internals Approved 2/24/2009
		ANS-19.11-1997 (R2011) Calculation and Measurement of the Moderator Temperature Coefficient of Reactivity for Pressurized Water Reactors RF 6/17/2011
		ANS-19.12 Nuclear Data for the Production of Radioisotope

Table 7 – SRA Organizational Chart

JCNRM
American Nuclear Society (ANS)/
American Society of Mechanical Engineers (ASME)
Joint Committee on Nuclear Risk Management (JCNRM)

Robert J. Budnitz, ANS Co-chair
Lawrence Berkeley National Laboratory

C. Rick Grantom, ASME Co-chair
South Texas Project Nuclear Operating Company

Scope:

The JCNRM Consensus Committee is responsible for the preparation and maintenance of voluntary consensus standards that establish safety and risk criteria and methods for completion of probabilistic risk analysis (PRA) and risk assessments. Additional related standards activities may be performed as upon concurrence of the ANS Standards Board and the ASME Standards & Certification Board. These criteria and methods are applicable to design, development, construction, operation, decontamination, decommissioning, waste management, and environmental restoration for nuclear facilities. Activities of the consensus committee shall be guided by the Procedures for ASME Codes and Standards Development Committees but shall also meet the intent of ANS Standards Committee Procedures Manual for Consensus Committees unless specifically authorized by the ANS Standards Board.

The JCNRM may be tasked with reviewing / commenting on risk technology related proposed provisions of standards developed by other ASME / ANS Standards Committees at the request of those standards committees.

JCNRM Membership:

Robert J. Budnitz ASME Co-chair, Lawrence Berkeley National Laboratory
Rick Grantom, ANS Co-chair, South Texas Project NOC
Dennis W. Henneke, ANS Co Vice Chair, General Electric
Pamela F. Nelson, ASME Co Vice Chair, National Autonomous University of Mexico
Paul J. Amico, Hughes Associates
Victoria K. Anderson, Nuclear Energy Institute
Robert A. Bari, Brookhaven National Laboratory
Sidney Bernsen, Individual
James R. Chapman, Scientech
Mary Drouin, U.S. Nuclear Regulatory Commission
David Finnicum, Westinghouse Electric Co., LLC
Karl N. Fleming, Individual (KNF Consulting Services)
H. Alan Hackerott, Omaha Public Power District
Eugene A Hughes, Etranco, Inc.
Kenneth L. Kiper, FPL Energy Company/NextEra Energy
Shigeo Kojima, Individual (Kojima Risk Institute, Inc.)
Gregory A. Krueger, Exelon Corp.
Jeffrey L. Lachance, Sandia National Laboratories
Richard H. Lagdon, U.S. Department of Energy
Stanley H. Levinson, AREVA, Inc.
Stuart R. Lewis, Electric Power Research Institute
Mayasandra K. Ravindra, Individual, (MKRavindra Consulting)

Martin B. Sattison, Idaho National Laboratory
Raymond E. Schneider, Westinghouse Electric Co., LLC
Barry D. Sloane, ERIN Engineering & Research, Inc.
Douglas E. True, ERIN Engineering & Research, Inc.
Donald J. Wakefield, ABS Consulting,Inc.
Ian B. Wall, Individual
James W. Young, GE Hitachi
Gilbert L. Zigler, ENERCON

Alternates:
Biff Bradley, Alternate for Victoria Anderson, Nuclear Energy Institute
Kenneth Canavan, Alternate for Stuart Lewis, Electric Power Research Institute
Donnie G. Harrison, Alternate for Mary Drouin, U.S. Nuclear Regulatory Commission
Yunlong Jonathan Li, Alternate for Dennis Henneke, GE Nuclear Energy

Report of JCNRM:
The JCNRM held two four-day meetings; February 2013 in Phoenix, Arizona, and September 2013 in Baltimore, Maryland. A new addenda to the JCNRM's main "flagship" PRA methodology standard for LWR PRA was approved and published in 2013. This "addenda" known colloquially as "Addenda B" and formally designated as ASME/ANS RA-b-2013, contains changes that are mostly of a clarifying or consistency-across-the-standard nature, plus bringing many citations and other things up to date. Work on the next revision, which the JCNRM will call a "new edition", is already underway. This new version is expected to contain many substantive changes based on feedback from recent users of the standard, along with extensive re-formatting and the like. The schedule for this next version is not yet clear, but is expected to be complete by mid-2015. A final ballot of ASME/ANS RA-S-1.4-2013, "Advanced Non LWR PA Standard," was successful and the standard was published and issued in December 2013 for a 36-month trial use period. Another draft of ASME/ANS-58.22, "Low Power Shutdown PRA Methodology," was completed and issued for ballot. The ballot closed on 12/17/2013 requiring additional comment resolutions. Drafts are also being revised for ASME/ANS RA-1.2 (formerly ANS-58.24), "Severe Accident Progression and Radiological Release (Level 2) PRA Methodology to Support Nuclear Installation Applications;" ASME/ANS RA-1.3 (formerly ANS-58.25), "Standard for Radiological Accident Offsite Consequence Analysis (Level 3 PRA) to Support Nuclear Installation Applications;" and ASME/ANS RA-S-1.5, "Advanced Light Water Reactor PRA Standard." All three are expected to submit drafts to JCNRM for ballot in 2014.

The merger creating the JCNRM has two aspects, an "organizational" aspect and a "business" aspect. The "organizational" aspect, which was completed in early 2012 after over two years of administrative and liaison work, involved developing a "Rules and Operating Procedure" and a new structure for the joint committee. The structure consists of four subcommittees and a series of about ten writing groups and working groups, and a half-dozen short-term project teams. The two societies' Boards approved the "Rules and Operating Procedure" in final form in late 2011, and the new structure has also been put into place. The new JCNRM is now formally in existence and has been operating as such since spring 2012, after having operated informally as a single joint entity for over a year prior to that. With this series of steps in place, the former ANS Risk Informed Standards Committee and the former ASME Committee on Nuclear Risk Management have effectively ceased to exist.

The JCNRM "business" aspect is not yet in place. Issues of revenue sharing and sharing of administrative tasks still need to be formally resolved. Negotiations have been advancing recently after a long period of slower movement. The outlines of the final business arrangement are now in place, although nothing has been "approved" in final form yet. ANS assumption of the administrative work of editing and publishing all new JCNRM standards has been initiated. ASME

has assumed the work of arranging meetings, managing the finances, managing the ballot process, and a few other administrative tasks.

Future Plans

The JCNRM's Executive Committee has been meeting more-or-less bi-weekly by conference call to plan the next two years' activities. The main effort is to develop the next version of the main PRA Combined Standard, which is planned now for early 2015. This next version, which we will call a "new edition" instead of an "addendum," is expected to have substantial changes to the format as well as to the content, based largely on feedback received in the past 2-3 years as this standard has been used by the commercial nuclear power operating fleet and by the NRC. During this period of use, many areas have been identified where inconsistencies exist between different parts of the large PRA standard, mostly due to variable interpretations, although a few other problems have been discovered during use. A number of what the JCNRM has called "cross cutting issues" have also been identified, each of which is being evaluated and worked on by one of several ad hoc project teams within the larger JCNRM. Some of these issues have policy implications for how the standard is to be used, but mostly these are issues with technical substance.

The JCNRM has also recently established a separate new subcommittee, the Subcommittee on Risk Applications, with the charter to be the JCNRM interface with ANS and ASME (and other SDOs in the future) so as to provide assistance to other standards-development projects whenever such a project desires to develop a new standard (or modify an existing standard) to provide risk-informed or performance-based requirements. This new JCNRM subcommittee will be the JCNRM interface with the ANS Standards Board's new Risk-informed and Performance-based Principles Policy Committee (RP3C.)

In early 2013, the JCNRM appointed two task groups, one to recommend whether it should begin the development of a new standard for PRA to evaluate the risk from spent fuel pools, and another to evaluate the need and efficacy of a possible new standard covering PRA for small modular reactors of various designs. Decisions on these will be debated by the JCNRM at its upcoming meeting in Palm Springs, FL, in February 2014. There is also some early discussion on whether the JRNRM should start working on PRA standards for nonreactor nuclear facilities, which standards are of great interest to the US Department of Energy.

Active standards/projects:

ANS/ASME-58.22, "Low-Power Shutdown PRA Methodology" (proposed new standard)

ASME/ANS RA-S, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications" (revision of ASME/ANS RA-S-2008)

ASME/ANS RA-S-1.2, "Severe Accident Progression and Radiological Release (Level 2) PRA Methodology to Support Nuclear Installation Applications" (previously ANS/ASME-58.24) (proposed new standard)

ASME/ANS RA-S-1.3, "Standard for Radiological Accident Offsite Consequence Analysis (Level 3 PRA) to Support Nuclear Installation Applications" (previously ANS/ASME-58.25) (proposed new standard)

ASME/ANS RA-S 1.5, "Advanced Light Water Reactor PRA Standard" (proposed new standard)

The following four subcommittees report directly to the JCNRM:

Subcommittee on Standards Development (SC/SD)

Charter:

To assist in the development of standards and guides on probabilistic risk assessment (PRA) methods supporting risk-informed and performance-based applications for nuclear facilities.

SC/SD *Membership:*
Barry D. Sloane, Chair
Dennis W. Henneke, Vice Chair
Victoria K. Anderson
Sidney Bernsen
Edward T. Burns
James R. Chapman
Heather L. Detar
Mary Drouin
Karl N. Fleming
Ching Guey
Eugene A. Hughes
Mark T. Leonard
Stuart R. Lewis
Robert J. Lutz Jr
Zhegang Ma
Michael A. Macfarlane
Martin B. Sattison
Vincent Sorel
Futoshi Tanaka
Donald J. Wakefield
Timothy A. Wheeler
Keith Woodard
Fatma Yilmaz

Alternates:
Amir Afzali (alt to M. Macfarlane)
Kenneth Canavan (alt to S. Lewis)
Gerry W. Kindred (alt to C. Guey)

SC/SD REPORT:
As the development of new standards is authorized by JCNRM, SC-SD establishes or, as in the case of the writing groups in existence when JCNRM was formed, takes responsibility for overseeing the progress of development of these standards. Subcommittee meetings provide a forum for interaction among the writing groups to help ensure appropriate consistency among the new standards, consider issues related to interfacing with the existing PRA standard (RA-S), issues regarding trial use of new standards, readiness for consensus ballot, writing group schedule progress, etc.

A Spent Fuel Pool (SFP) PRA Standard Needs Investigation Project Team was established in late 2012 to determine the need for and feasibility of preparing a PRA standard for SFP PRA, largely in response to early feedback from the Fukushima Daiichi event. The project team has met several times, obtained and considered input from prior and ongoing SFP PRA pilots, developed a list of technical issues, and is categorizing these (e.g., basis for proceeding with a standard, issue requiring further industry research prior to completing a standard, etc.). The results will be reviewed at a project team meeting planned for February 2014 and a recommendation developed for SC-SD

and JCNRM regarding next steps, if any.

The SC/SD is currently responsible for 5 authorized PRA standards in various stages of development, and consideration of the need for one possible new standard. They include the following:

ASME/ANS-58.22, "Low-Power Shutdown PRA Methodology" (proposed new standard)

Scope:

This standard sets forth criteria and specific methods for plant-specific probabilistic risk assessments (PRAs) to be used to develop risk-informed decisions regarding low power and shutdown operations at light water nuclear power plants. It addresses those attributes of a PRA that will ensure that the scope and level of quality of the assessment are appropriate to the decision being considered. The standard addresses the use of risk information for making plant improvements, the risk, ranking of components, and the development of decisions that can benefit from risk information. The scope of this standard is limited to internal and external events (excluding internal fires) while operating at low power and shutdown conditions. Both requirements for quantitative and qualitative methods are included.

Membership:

Donald Wakefield, Chair, ABS Consulting; Robert Budnitz, Lawrence Berkeley National Laboratory; Doug Hance, EPRI; Gene Hughes, ETRANCO; LLC; Kenneth Kiper, FPL; Zhegang Ma, Idaho National Laboratory; Jeff Mitman, US Nuclear Regulatory Commission; Rupert Weston, Westinghouse; Famah Yilmaz, STPEGS; Antonio M. Zoulis (Alternate)

Status: This standard is expected to ultimately be incorporated into RA-S as a new Part. A revised draft standard completed its latest consensus ballot as a trial use standard in December 2013, with 19 approvals and 4 disapprovals. The LP/SD Writing Group is responding to the comments received, and a recirculation ballot is planned for end of 1Q'14. It appears from the nature of the comments that passage is likely on recirculation. If so, the LP/SD PRA standard could be published for trial use by 3Q'14.

ASME/ANS RA-S-1.2, "Severe Accident Progression and Radiological Release (Level 2) PRA Methodology to Support Nuclear Installation Applications" (previously ANS/ASME-58.24) (proposed new standard)

Scope:

Criteria and acceptable methods are defined for the evaluation of containment performance and radiological releases to the environment from accidents in a nuclear power plant that result in damage to fuel within the reactor vessel for use in risk-informed applications requiring Level 2 probabilistic risk assessment (PRA). The Standard will address sequences initiated by internal or external events during all modes of reactor operation. The initial scope will focus on full power operations.

Membership:

Edward Burns (Chair), ERIN Engineering; Donald Helton, U.S. Nuclear Regulatory Commission; Mark Leonard, dycoda, LLC; Raymond Schneider, Westinghouse Electric Corp.

Status: The L2 Writing Group has addressed comments received from the early 2013 ballot, as well as comments from a SC/SD ballot readiness review project team, and a new consensus ballot of this draft standard as a trial use standard is scheduled to begin end of January 2014.

ASME/ANS RA-S-1.3, "Standard for Radiological Accident Offsite Consequence Analysis (Level 3 PRA) to Support Nuclear Installation Applications" (previously ANS/ASME-58.25) (new standard)

Scope:

This standard provides requirements for application of risk-informed decisions related to the consequences of accidents involving atmospheric release of radioactive materials to the environment. The standard is envisioned to apply to current and future light water reactor designs, other reactor designs, and nonreactor applications such as radiological dispersion device (RDD) incidents. The consequences to be addressed include health effects (early and late) and longer term environmental and economic impacts. The required capabilities allow determination of the efficacy of mitigation strategies on reducing consequences.

Membership:

Keith Woodard, Chair, ABS Consulting; Grant Teagarden, Vice Chair, ERIN; David Johnson, ABS; Gerry W. Kindred, Tennesse Valley Authority; Stanley Levinson, AREVA Inc.; Brian T. Wagner; U.S. Nuclear Regulatory Commission; Suchandra Tina Ghosh (Alternate), U.S. Nuclear Regulatory Commission

Status: The L3 Writing Group has responded to comments received from a consensus ballot in late 2012/early 2013 and is preparing the draft standard for another consensus ballot as a trial use standard. However, NRC has not responded to comment dispositions proposed by the Writing Group, despite repeated communication attempts by the Writing Group, and this has significantly delayed proceeding with a new ballot addressing prior comments. At the September 2013 JCNRM meeting, NRC representatives in attendance indicated they would attempt to re-establish active NRC participation on the Writing Group (the original NRC representative had passed away in 2012), but there has been no progress noted to date. This will be a discussion topic at the February 2014 JCNRM SC-SD meeting.

ASME/ANS RA-S-1.4-2013, "Probabilistic Risk Assessment Standard for Advanced Non-LWR Nuclear Power Plants" (new standard issued for trial use and pilot application)

Scope:

This standard establishes requirements for a PRA for advanced non-LWR nuclear power plants. The requirements in this Standard were developed for a broad range of PRA scopes that may include:

a) Different sources of radioactive material both within and outside the reactor core but within the boundaries of the plant whose risks are to be determined in the PRA scope selected by the user. The technical requirements in this trial use version of the Standard are limited to sources of radioactive material within the reactor coolant system pressure boundary. Technical requirements for other sources of radioactive material such as the spent fuel system are deferred to future editions of this Standard.

b) Different plant operating states including various levels of power operation and shutdown modes.

c) Initiating events caused by internal hazards, such as internal events, internal fires and internal floods, and external hazards such as seismic events, high winds, and external flooding

d) Different event sequence end states including core or plant damage states, and release categories that are sufficient to characterize mechanistic source terms, including releases from event sequences involving two or more reactor units or modules for PRAs on multi-reactor or multi-unit plants.

e) Evaluation of different risk metrics including the frequencies of modeled core and plant damage states, release categories, risks of offsite radiological exposures and health effects, and the integrated risk of the multi-unit plant if that is within the selected PRA scope. The risk metrics supported by this Standard are established metrics used in existing LWR Level 3 PRAs such as frequency of radiological consequences (e.g., dose, health effects) which are inherently technology neutral. Surrogate risk metrics used in LWR PRAs such as core damage frequency and large early release frequency are not used as they may not be applicable to non-LWR PRAs.

f) Quantification of the event sequence frequencies, mechanistic source terms, offsite radiological consequences, risk metrics, and associated uncertainties, and using this information in a manner consistent with the scope and applications PRA.

Membership:

Karl. N. Fleming, Chair, KNF Consulting Services, LLC; Frank. Schaaf, Vice Chair, Sterling Refrigeration Corporation; Sidney A. Bernsen, Individual; Robert J. Budnitz, Lawrence Berkeley National Laboratory; Mary Drouin, U.S. Nuclear Regulatory Commission; Bryan A. Erler, Erler Engineering; David Johnson, ABS Consulting; Peter Lowry, Pacific Northwest National Laboratory; L. Lusse, PBMR Proprietary, Ltd.; Andrea Maioli, Westinghouse Electric Company; H. Matsumiya, Toshiba; Martin B. Sattison, Idaho National Laboratory; Nathan. Siu, U.S. Nuclear Regulatory Commission; Grant A. Tinsley, Technology Insights; John Wood, U.S. Nuclear Regulatory Commission; James Young, GE Hitachi

Status: This standard has been approved for trial use and has recently been published. Several potential pilot applications have been identified, e.g., within DOE. The ANLWR Writing Group will remain as an active project team under SC-SD to facilitate trial use and pilot applications of this standard, respond to user inquiries, etc., and, following the trial use period, make a recommendation regarding ballot as an ANSI standard.

ASME/ANS RA-S 1.5, "Advanced Light Water Reactor PRA Standard" (proposed new standard)

Membership:

Jim Chapman (Chair), Scientech; Sidney Bernsen, Individual; Biff Bradley, NEI, Heather L. Detar; Karl N. Fleming, Individual (KNF Consulting Services); Donnie G. Harrison, U.S. Nuclear Regulatory Commission; Dennis W. Henneke, General Electric; Eugene A Hughes, ETRANCO; Jeffrey L. Lachance, Sandia National Laboratories; Robert J. Lutz Jr., Westinghouse; Michael A. Macfarlane; Patrick J. O'Regan, EPRI; Vincent Sorel; Futoshi Tanaka; Timothy A. Wheeler; Amir Afzali (Alternate)

Status: This standard is ultimately expected to be a mandatory appendix to the existing PRA standard, RA-S: This draft standard was planned to be balloted starting in September 2013, but two developments occurred that have delayed this. First, an effort was initiated to engage light water Small Modular Reactor (SMR) vendors to ensure that the standard would address their needs. Then, during the process of participating in this new activity, NRC notified JCNRM late in the process that they had identified inconsistencies between the draft standard and their intended application of that standard to the new plant licensing process. NRC has formed a task team to

better define their issues and make a recommendation (expected in February 2014) to the ALWR Writing Group, which will then attempt to modify the draft standard to help facilitate a successful consensus ballot. Depending on the extent of the changes, a revised draft could be ready for ballot sometime in 2Q'14.

Subcommittee on Standards Maintenance (SC/SM)

SC/SM Membership:
Paul J. Amico, Chair
Andrea Maioli, Vice Chair
Gareth W. Parry, Vice Chair
Vincent Andersen
K. Raymond Fine
David Finnicum
H. Alan Hackerott
Douglas C Hance
Donnie G. Harrison
Thomas G. Hook
Eugene A Hughes
Kenneth L. Kiper
Shigeo Kojima
Eddie A. Krantz
Jeffrey L. Lachance
Stanley H. Levinson
David N. Miskiewicz
Pamela F. Nelson
Steve P. Nowlen
Mayasandra K. Ravindra
Jean B. Savy
Raymond E. Schneider
Ian B. Wall
Rupert A. Weston
James W. Young
Gilbert L. Zigler

Charter:
To discuss, schedule, and approach technical issues related to updates to the current PRA standards. The SC/SD is responsible for the maintenance of the following standard:

ANSI/ASME/ANS RA-S-2008/Addenda A&B, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications" (consolidation and revision of ANSI/ASME RA-S- 2002, ANSI/ANS-58.21-2007, and ANSI/ANS-58.23-2007)

Scope:
PRA of internal and external hazards for all plant operating modes (low power and shutdown modes will be included at a future date). In addition, this Standard establishes requirements for a limited Level 2 PRA sufficient to evaluate large early release frequency (LERF). The only hazards explicitly excluded from the scope are accidents resulting from purposeful human-induced security threats (e.g., sabotage). This Standard applies to PRAs used to support applications of risk-informed decision-making related to design, licensing, procurement, construction, operation, and

maintenance. These requirements are written for operating power plants. They may be used for plants under design or construction, for advanced LWRs, or for other reactor designs, but revised or additional requirements may be needed. This version of the PRA Standard provides specific requirements for the following hazard groups:

a) Internal Events (Part 2)
b) Internal Floods (Part 3)
c) Internal Fires (Part 4)
d) Seismic Events (Part 5)
e) High Winds (Part 7)
f) External Floods (Part 8)
g) Other Hazards (Part 9)
h) Seismic Margin Assessment (Part 10)

Status: ANSI/ASME/ANS RA-S-2008 as initially published in 2008 combined ANSI/ASME/ANS-2002 (internal events/LERF), ANSI/ANS-58.21-2007 (external events), and ANSI/ANS-58.23-2007 (fire). Addenda A (of RA-S) was published in 2009; Addenda B (of RA-S) was approved and published in 2013. Addenda B contains changes that are mostly of a clarifying or consistency-across-the-standard nature, plus bringing many citations and other things up to date. Work on the next revision, which the JCNRM will call a "new edition," is already underway. This new version is expected to contain many substantive changes based on feedback from recent users of the standard, along with extensive re-formatting and the like. The schedule for this next version is not yet clear, but is expected to be complete by mid-2015. RA-S is segregated into 10 parts. Each is listed below with members of the working group:

Part 1, General Requirements for a Level 1 PRA, Including Large Early Release Frequency, Membership:
Gareth W. Parry, Chair; Thomas G. Hook, Vice Chair; Mary Drouin; Shigeo Kojima; Raymond E. Schneider; Ian B. Wall; Donnie G. Harrison (Alternate)

Part 2, Requirements for Internal Events at-Power PRA Membership:
H. Alan Hackerott Chair; Eddie A. Krantz Vice Chair; Mary Drouin; David Finnicum; Jeffrey L. Lachance; Stanley H. Levinson; Pamela F. Nelson; James W. Young; Donnie G. Harrison (Alternate)

Part 3, Requirements for Internal Flood at-Power PRA Membership:
Rupert A. Weston Chair; Karl N. Fleming Vice Chair; Stephen C. Dinsmore; James C. Lin; Vish Patel; Ian B. Wall; Donnie G. Harrison (Alternate)

Part 4, Requirements for Fires at-Power PRA Membership:
Steve P. Nowlen Chair; Dennis W. Henneke Vice Chair; Raymond H. Gallucci; J. S. Hyslop; Francisco J. Joglar; Mardy Kazarians; Jeffrey L. Lachance; Stuart R. Lewis; Ashley M. Lindeman; David N. Miskiewicz; Bijan Najafi; Gareth W. Parry; Nathan O. Siu; Kiang Zee

Parts 5 - 10, External Hazards at-Power PRA Membership:
Mayasandra K. Ravindra, Chair, Vincent Andersen, Vice Chair; Stephen Eder, Vice Chair; K. Raymond Fine, Vice Chair; Robert T. Sewell, Vice Chair; Paul J. Amico; Robert J. Budnitz; Nilesh C. Chokshi; Calin Eftimie; Donnie G. Harrison; Andrea Maioli; Jean B. Savy; Jiejuan Tong; Wen H. Tong; Mary Drouin (Alternate)

Subcommittee on Risk Application (SCoRA)

SCoRA Membership:
Kenneth L. Kiper, Chair
Stanley H. Levinson, Vice Chair
Robert J. Budnitz
Gerry W. Kindred
Lynn A. Mrowca
Pamela F. Nelson
Patrick J. O'Regan
Gilbert L. Zigler

Charter:

To interface with the ANS Standards Board, the ASME Board on Nuclear Codes and Standards, and their subordinate groups, and other standards development organizations (SDOs) regarding nuclear related standards that include or plan to include risk assessment, risk management, and risk-informed applications. The work of the SCoRA is focused on supporting these SDOs in the development and updating of risk-informed standards, as requested by the cognizant SDO. The objective is to strive for consistency in other nuclear-related standards with risk management principles, in general, and to work toward consistency with the JCNRM's PRA standards.

When the SCoRA organizes a technical interface with a specific nuclear-related standard, it will draw upon the membership of the JCNRM, but the interface activity need not be limited to that membership. The interface activity can be informal without a written product, but if a written review product is produced, the report itself is intended to be a product of the SCoRA, even if developed mainly by an ad hoc subsidiary group.

Part of the interface activity includes an education function, for which the SCoRA will avail itself of resources that exist among the broader JCNRM membership. The SCoRA will also consider mechanisms to disseminate "lessons learned" from reviewing and commenting on nuclear-related standards to other SDOs and writing groups who have similar needs.

SCoRA REPORT:
SCoRA's first unofficial (i.e., prior to JCNRM approval of the subcommittee and its charter) was held on February 27, 2013. This was considered an organizational meeting, during which the charter, membership, interaction with the new ANS subcommittee of the Standards Board (Risk and Performance-Based Principles Policy Committee, RPBPPC) [now the RP3C], and involvement of other standard development organizations (SDOs) were discussed. At the February 28, 2013, meeting, JCNRM approved the new subcommittee and its charter. In 2013, SCoRA, via its September 11, 2013, meeting, was trying to clarify its mission and the methods to achieve it. A draft process was developed for existing standards. SCoRA is still trying to understand the organization and leaders of the non-JCNRM portions of the ASME and ANS standards community; initially SCoRA will be entertain requests for assistance to provide risk insights in an existing or new standard, or a standard undergoing modification. A more proactive approach is expected to be developed in the future. SCoRA has reviewed and provided comments on the ASME ISTE document (risk-informed approach to identifying high and low safety significant components for a risk-informed inservice testing program. A review of ASME Code Case N720 was also performed; at this time, no SCoRA help was deemed needed.

Subcommittee on Planning, Implementation & Interpretation (SC-PII)

SC-PII Membership:
Eugene A Hughes, Chair
Gregory A. Krueger, Vice Chair
Amir Afzali
Robert A. Bari
Biff Bradley
Robert J. Budnitz
Allen L. Camp
Gary M. Demoss
Stephen Gosselin
Rick Grantom
Donnie G. Harrison
Artur Lyubarskiy
Andrea Maioli
Pamela F. Nelson
Barry D. Sloane
Barbara Snyder
Douglas E. True
James W. Young
Gilbert L. Zigler
Vincent Sorel
Stanley H. Levinson
David N. Miskiewicz
Gareth W. Parry
Gregory A. Krueger
Sidney Bernsen
Irina B. Kouzmina
Ian B. Wall

Charter:
To assist with planning, implementation & interpretations as they relate to the RA-S standard.

ANS/ASME Joint Committee on Nuclear Risk Management
Organizational Chart

Co-chair: Robert J. Budnitz — Co-chair: C. Rick Grantom
Vice co-chair: Dennis W. Henneke — Vice co-chair: Pamela F. Nelson

Subcommittee on Risk Applications (SCoRA) Kenneth Kiper (Chair) Stanley Levinson (Vice Chair)	**Subcommittee on Standards Development (SC/SD)** Barry Sloane (Chair) Dennis Henneke (Vice Chair)	**Subcommittee on Standards Maintenance (SC/SM)** Paul Amico (Chair) Andrea Maioli (Vice Chair)	**Subcommittee on Planning, Implementation & Interpretation (SC-PII)** Gene Hughes (Chair) Greg Krueger (Vice Chair)
	ANS/ASME-58.22, Low Power Shut Down PRA	ASME/ANS RA-S, Level 1 PRA Including LERF (Part 1)	Working Group on Interpretations
	ASME/ANS RA S-1.2, Level 2 PRA (previously ANS-58.24)	ASME/ANS RA-S, Internal Events At-Power PRA (Part 2)	
	ASME/ANS RA-S-1.3, Level 3 PRA (previously ANS-58.25)	ASME/ANS RA-S, Internal Flood At-Power PRA (Part 3)	
	ASME/ANS RA-S-1.4, Non LWR PRA	ASME/ANS RA-S, Fires At-Power PRA (Part 4)	
	ASME/ANS RA-S-1.5, Advanced LWR PRA	ASME/ANS RA-S, External Hazards At-Power (Parts 5-10)	

Table 8 – JCNRM Organizational Chart

Appendix A
Standards Service Award

Established in 1984, the ANS Standards Service Award recognizes outstanding achievement by individuals in the generation and use of ANS standards in the field of nuclear science and engineering. The purpose of the award is to identify and honor those individuals who have made significant contributions to the development of ANS nuclear Standards accepted by recognized authorities as the most practical and appropriate solution of a recurring problem. Any member of the Society can nominate worthy candidates for the ANS Standards Service Award. The nominees shall be current or past members of the Society in good standing. Past recipients of the award include the following individuals:

Year Awarded	Recipients
2013	Carl A. Mazzola
2012	Elizabeth B. Johnson (posthumously) Patricia A. Schroeder
2011	No recipient selected
2010	Allen L. Camp Thomas P. McLaughlin
2009	Calvin M. Hopper
2008	Donald J. Spellman
2007	William L. Whittemore (posthumously)
2006	Robert J. Budnitz
2005	James F. Mallay
2004	Charles H. Moseley
2003	Wade J. Richards
2002	Francis M. Alcorn
2001	Michael J. Wright
2000	William C. Hopkins
1999	Dimitrios Cokinos
1998	Marilyn D. Weber
1997	David R. Smith
1996	Tawfik M. Raby
1995	Hugh K. Clark
1994	George L. Wessman
1993	Joseph T. Thomas
1992	J. Ed Smith (posthumously)
1991	David K. Trubey
1990	James F. Mallay
1989	Walter H. D'Ardenne
1988	A. Dixon Callihan Ralph G. Chalker Miles C. Leverett

Appendix B
American Nuclear Society – American National Standards
Sales List (*All standards listed are available as individual publications)*

CURRENT STANDARDS

ANS Designation — Order # — Price

ANS-1-2000 (R2012) 240242 $40.00
Conduct of Critical Experiments
(Revision of ANS-1-1987; R1992)

ANS-2.3-2011 240283 $70.00
Estimating Tornado, Hurricane, and Extreme Straight Line Wind Characteristics at Nuclear Facility Sites (Supersedes ANS-2.3-1983)

ANS-2.15-2013 240293 $171.00
Criteria for Modeling and Calculating Atmospheric Dispersion of Routine Radiological Releases from Nuclear Facilities

ANS-2.17-2010 240281 $138.00
Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants (Supersedes ANS-2.17-1980; R1989)

ANS-2.21-2012 240290 $55.00
Criteria for Assessing Atmospheric Effects On the Ultimate Heat Sink

ANS-2.23-2002 (R2009) 240244 $129.00
Nuclear Plant Response to an Earthquake

ANS-2.26-2004 (R2010) 240255 $119.00
Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design

ANS-2.27-2008 240274 $121.00
Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments

ANS-2.29-2008 240275 $138.00
Probabilistic Seismic Hazard Analysis

ANS-3.2-2012 240287 $125.00
Managerial, Administrative, and Quality Assurance Controls for the Operational Phase of Nuclear Power Plants (Revision of ANS-3.2-2006)

ANS-3.4-2013 240294 $138.00
Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants (Supersedes ANS-3.4-1996; R2002)

ANS-3.5-2009 240271 $121.00
Nuclear Power Plant Simulators for Use in Operator Training and Examination
(Supersedes ANS-3.5-1998)

ANS-3.11-2005 (R2010) 240260 $135.00
Determining Meteorological Information at Nuclear Facilities (Revision of ANS-3.11-2000)

ANS-5.1-2005 240256 $152.00
Decay Heat Power in Light Water Reactors
(Revision of ANS-5.1-1994)

CURRENT STANDARDS

ANS Designation — Order # — Price

ANS-5.4-2011 240285 $78.00
Method for Calculating the Fractional Release of Volatile Fission Products from Oxide Fuel
(Revision of ANS-5.4-1982)

ANS-5.10-1998 (R2013) 240233 $132.00
Airborne Release Fractions at Non-Reactor Nuclear Facilities

ANS-6.1.2-2013 240295 $55.00
Group-Averaged Neutron and Gamma-Ray Cross Sections for Radiation Protection and Shielding Calculations for Nuclear Power Plants (Revision of ANS-6.1.2-1999; R2009)

ANS-6.3.1-1987 (R2007) 240158 $78.00
Program for Testing Radiation Shields in Light Water Reactors (LWR)
(Revision of ANS-6.3.1-1980)

ANS-6.4-2006 240264 $208.00
Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants
(Revision of ANS-6.4-1997; R2004)

ANS-6.4.2-2006 240263 $78.00
Specification for Radiation Shielding Materials
(Revision of ANS-6.4-1985; R1997; R2004)

ANS-6.6.1-1987 (R2007) 240153 $142.00
Calculation and Measurement of Direct and Scattered Gamma Radiation from LWR Nuclear Power Plants (Revision of ANS-6.6.1-1979)

ANS-8.1-1998 (R2007) 240234 $95.00
Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors
(Revision of ANS-8.1-1983; R1988)

ANS-8.3-1997 (R2012) 240224 $102.00
Criticality Accident Alarm System
(Revision of ANS-8.3-1986)

ANS-8.5-1996 (R2012) 240220 $64.00
Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material
(Revision of ANS-8.5-1986)

ANS-8.6-1983 (R2010) 240119 $32.00
Safety in Conducting Subcritical Neutron-Multiplication Measurements in Situ
(Revision of N16.3-1975)

ANS-8.7-1998 (R2012) 240235 $87.00
Nuclear Criticality Safety in the Storage of Fissile Materials
(Revision of N16.5-1975; R1982; R1987)

ANS-8.10-1983 (R2005) 240123 $47.00
Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement
(Revision of N16.8-1975)

CURRENT STANDARDS

ANS Designation — Order # — Price

ANS-8.12-1987 (R2011) 240163 $95.00
Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors (Revision of ANS-8.12-1978)

ANS 8.14-2004 (R2011) 240253 $47.00
Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors

ANS-8.15-1981 (R2005) 240102 $87.00
Nuclear Criticality Control of Special Actinide Elements

ANS-8.17-2004 (R2009) 240254 $47.00
Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors
(Revision of ANS-8.17-1984; R1997)

ANS-8.19-2005 240257 $40.00
Administrative Practices for Nuclear Criticality Safety (Revision of ANS-8.19-1996)

ANS-8.20-1991 (R2005) 240178 $47.00
Nuclear Criticality Safety Training

ANS-8.21-1995 (R2011) 240204 $47.00
Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors

ANS-8.22-1997 (R2011) 240227 $56.00
Nuclear Criticality Safety Based on Limiting and Controlling Moderators

ANS-8.23-2007 (R2012) 240269 $119.00
Nuclear Criticality Accident Emergency Planning and Response (Revision of ANS-8.23-1997)

ANS-8.24-2007 (R2012) 240266 $110.00
Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations

ANS-8.26-2007 (R2012) 240268 $40.00
Criticality Safety Engineer Training and Qualification Program

ANS-8.27-2008 240273 $47.00
Burnup Credit for Light Water Reactor Fuel

ANS-10.2-2000 (R2009) 240243 $47.00
Portability of Scientific and Engineering Software (Revision of ANS-10.2-1988)

ANS-10.4-2008 240277 $130.00
Verification and Validation of Non-Safety Related Scientific and Engineering Computer Programs for the Nuclear Industry
(Revision of ANS-10.4-1987; R1998)

ANS-10.5-2006 (R2011) 240261 $56.00
Accommodating User Needs in Scientific and Engineering Computer Software Development
(Supersedes ANS-10.5-1994)

CURRENT STANDARDS

ANS Designation — Order # — Price

ANS-10.7-2013 240292 $110.00
Non-Real Time, High-Integrity Software for the Nuclear Industry—Developer Requirements

ANS-14.1-2004 (R2009) 240252 $47.00
Operation of Fast Pulse Reactors
(Revision of ANS-14.1-1975; R2000)

ANS-15.1-2007 (R2013) 240267 $95.00
The Development of Technical Specifications for Research Reactors
(Revision of ANS-15.1-1990; R1999)

ANS-15.2-1999 (R2009) 240237 $64.00
Quality Control for Plate-Type Uranium-Aluminum Fuel Elements
(Revision of ANS-15.2-1990)

ANS-15.4-2007 240272 $70.00
Selection and Training of Personnel for Research Reactors (Revision of ANS-15.4-1988; R1999)

ANS-15.8-1995 (R2013) 240215 $64.00
Quality Assurance Program Requirements for Research Reactors
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Containment System Leakage Testing Requirements (Revision of ANS-56.8-1994)

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Fuel Assembly Identification
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