AMERICAN NUCLEAR SOCIETY

STANDARDS COMMITTEE
REPORT OF ACTIVITIES

2010

AMERICAN NUCLEAR SOCIETY STANDARDS COMMITTEE

Report of Activities

2010

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TABLE OF CONTENTS

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 2010. 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 development. As of the end of 2010, there were 73 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 four consensus committees:

N16: Nuclear Criticality Safety;

N17: Research Reactors, Reactor Physics, Radiation Shielding & Computational Methods;

NFSC: Nuclear Facilities Standards Committee; and

RISC: Risk Informed Standards Committee.

This report is presented in four 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 more than 90 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 four consensus committees, Nuclear Criticality Safety (N16), Research Reactors, Reactor Physics, Radiation Shielding and Computational Methods (N17), Nuclear Facilities Standards Committee (NFSC), and Risk Informed Standards Committee (RISC). 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.

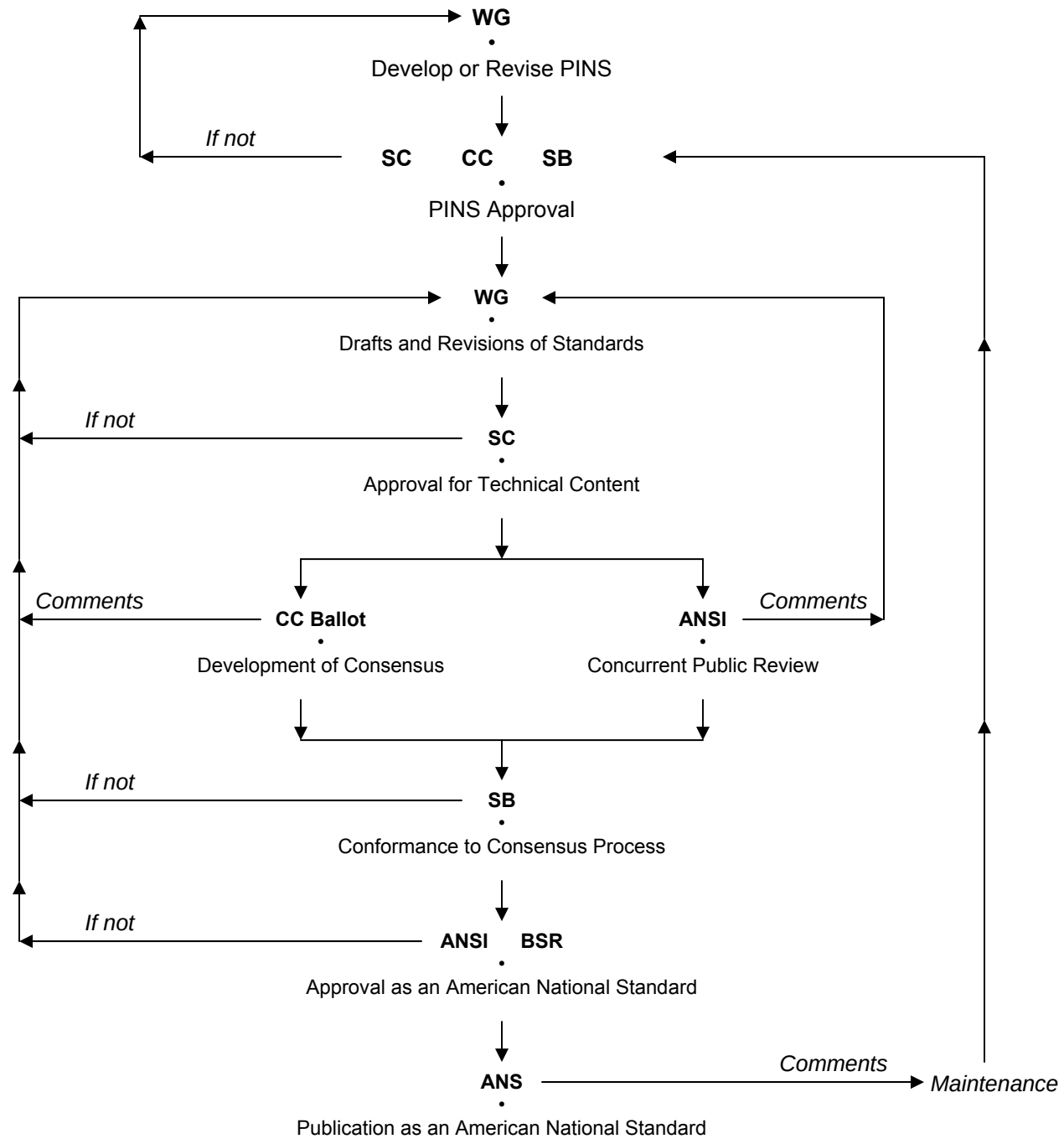
Simultaneous to the CC ballot, public review (PR) is conducted through the auspices of ANSI. ANSI announces a 60-day public review period for the proposed standard in its publication, *Standards Action*. As with CC comments, all comments from PR must be considered and resolved promptly.

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, the proposed standard is sent to the BSR with documentation 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 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

Dr. N. Prasad Kadambi, CHAIR

In 2010, the American Nuclear Society appeared poised to implement major structural changes so as to more effectively present itself as the premier brand representative for nuclear technology. While many technical societies and standards developing organizations include nuclear subjects within their portfolios, only ANS and its members have the breadth and depth to cover the whole technology front. As of this writing, it remains unclear exactly how the ANS standards program will be affected by the modified organization. It does appear quite likely that creation of some new organizational elements may enable the standards program to undertake new initiatives in areas such as professional development. There may also be opportunities to improve the standing of the ANS standards program by including standards related to conformity assessment. By having a conformity assessment standards program, ANS will be better able to direct how the design and operations standards that it has traditionally developed are actually implemented out in the field.

Another hallmark of 2010, viewed in a historical perspective, is likely to be that it was the year before the Fukushima earthquake. In retrospect, 2010 appears so much simpler than the year that follows because certain fundamental assumptions, such as the adequacy of a design basis event approach, were called into question by the earthquake. It appears likely that a source of problems that is identified will be the deterministic and prescriptive process that characterizes the conventional design basis event approach. A more robust risk-informed and performance-based approach may turn out to be the remedy in waiting. The ANS Standards Committee has been on record for some years as championing the more technically advanced risk-informed and performance-based approach.

In pursuing such technical advancements in standards, the ANS works collaboratively with other societies. Specifically, the ANS-ASME Joint Committee on Nuclear Risk Management holds considerable promise for putting out standards that will provide for sound technical judgments in employing probabilistic risk assessments. Substantial progress was achieved in 2010 toward realizing this collaboration.

The ANS standards program was audited by the American National Standards Institute (ANSI) in March of 2010. As a result of the audit, ANSI recommended a few changes to the ANS Standards Committee Rules and Procedures. In compliance, ANSI's suggestions were incorporated and revised procedures were submitted in December 2010 for approval. We expect to gain approval of these revised procedures and be awarded reaccreditation in early 2011.

The ANS Standards Board formally approved a policy on Trial Use and Pilot Application Standards. The policy was formalized for standards considered state of technology or when general industry understanding or acceptance of the technical content does not warrant its publication as an American National Standard until prospective users have had an opportunity to evaluate it under pilot conditions.

Nominated by the ANS Standards Committee, Michael S. Kurzeja was selected as one of the three winners of the International Electrotechnical Commission (IEC) Young Professionals Competition. As recipient, he received support to attend the IEC 2010 General Meeting in October 2010 in Seattle, Washington, and participated in a dedicated workshop alongside

recipients from other nationals where they learned about the IEC, standardization strategies, and conformity assessment.

Special efforts were made during 2010 to highlight the international standing of the ANS standards program:

- A presentation was made on behalf of the ANS Standards Committee at the "U.S. Codes and Standards Workshop: Applications for the Brazilian Oil & Gas and Nuclear Industries," held in Rio de Janeiro, Brazil, in August 2010.
- ANS was represented in a Nuclear Expo in Mumbai, India in October 2010.

On behalf of the ANS Standards Committee, a training opportunity for ANS members was provided at the Utility Working Conference in Amelia Island, Florida, in August of 2010. The seminar provided training on the application aspect of probabilistic risk assessment (PRA) and where regulatory policy fit in.

A presentation was provided at the U.S. Nuclear Regulatory Commission public meeting in October 2010. The public meeting addressed issues raised by the Nuclear Energy Institute about the future plans for the PRA standards. Both ANS and the American Society of Mechanical Engineers (ASME) participated.

The 2010 Standards Service Award was presented to two well-deserving recipients: Allen L. Camp and Thomas P. McLaughlin. With the exception of 1988, the first year the award was presented, this represented the first time that more than one recipient was selected.

The Nuclear Criticality Safety Committee (N16) voted in new leadership at its November 6, 2010, meeting in Las Vegas, Nevada. Robert D. Bush was elected as the fourth chair of the N16 Committee replacing Calvin M. Hopper. Hopper chaired N16 since 2000. The N16 Committee also elected Larry L. Wetzel as N16 Vice Chair and William R. Shackelford as Secretary Pro Temp.

Under the N17 Committee on Research Reactors, Reactor Physics, Radiation Shielding and Computational Methods, ANS-15 Subcommittee Chair Wade Richards retired May 2010. Sean O'Kelly was appointed as his successor of ANS-15 Subcommittee, Operation of Research Reactors.

The Nuclear Facilities Standards Committee approved the reformation of the ANS-26 Subcommittee [Emergency Planning] as well as leadership changes on the ANS-21 Subcommittee [Maintenance, Operations, Testing and Training], and the ANS-27 Subcommittee [Fuel Cycle, Waste Management and Decommissioning]. The newly appointed leadership is as follows:

- C. E. (Gene) Carpenter, ANS-21 Subcommittee Chair
- Sheila Lott, ANS-21 Subcommittee Vice Chair
- Evan Lloyd, ANS-26 Subcommittee Chair
- Charles Brown, ANS-26 Subcommittee Vice Chair
- Donald Eggett, ANS-27 Subcommittee Chair
- Jeffery Brault, ANS-27 Subcommittee Vice Chair

Allen Camp stepped down as chair of the Risk Informed Standards Committee (RISC) in January of 2010. RISC Vice Chair Robert J. Budnitz stepped into the role of chair. This committee continues to work jointly with the American Society of Mechanical Engineers Committee on Nuclear Risk Management in developing probabilistic risk assessment standards. A merger of the two committees is in development and anticipated to be finalized in 2011.

Other major accomplishments/advances worthy of mentioning for 2010 include:

- ANSI/ANS-2.17-2010, “Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants,” was granted approval as an American National Standard.
- Draft standard ANS-2.3, “Estimating Tornado, Hurricane, and Extreme Straight Line Wind Characteristics at Nuclear Facility Sites,” was completed and issued for committee approval.
- Draft standard ANS-2.21, “Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink,” was completed and issued for committee approval.
- Draft standard ANS-5.4, “Method for Calculating the Fractional Release of Volatile Fission Products from Oxide Fuel,” was completed and issued for committee approval.
- Draft standard ANS-19.6.1, “Reload Startup Physics Tests for Pressurized Water Reactors,” was completed and issued for committee approval.
- Draft standard ANS-58.14, “Safety and Pressure Integrity Classification Criteria for Light Water Reactors,” was completed and issued for committee approval.
- Draft standard ANS-58.25, “Standard for Radiological Accident Offsite Consequence Analysis (Level 3 PRA) to Support Nuclear Installation Applications,” was completed and issued for committee approval for trial use and pilot application.

The ANS Standards Committee provided seven clarifications to ANS standards to the public in 2010.

During 2010, 4 standards were certified as American National Standards including one new standard and three reaffirmations. Eight Project Initiation Notification System (PINS) forms were approved for new and revised standards.

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. *Nuclear criticality safety*
b. *Definitions of terminology used in nuclear science and technology*
c. *Facilities for handling radioactive isotopes, including the remote handling of radioactive materials*
d. *Research reactors and critical facilities*
e. *Reactor physics and radiation shielding*
f. *Ensuring the integrity of computer programs in the nuclear field*
g. *Siting requirements for nuclear facilities*
h. *Nuclear facility design, including safety criteria for the facility*
i. *Reactor operation, including operator training and selection*
j. *Fuel design, handling, and storage*
k. *Radioactive waste management*
l. *Remediation and restoration of sites used for nuclear facilities*
m. *Fission product behavior*
n. *Probabilistic risk assessment, risk management, and risk criteria*

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

N. Prasad Kadambi, **Chair,** Individual

Donald J. Spellman, Vice Chair, Oak Ridge National Laboratory

Robert J. Budnitz, Ex Officio Member (RISC), Lawrence Berkeley National Laboratory

Robert D. Busch, Ex Officio Member (N16), University of New Mexico

Peter S. Hastings, Member at Large, Duke Energy

Walter M. Justice, II, Member at Large, Tennessee Valley Authority

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

Carl A. Mazzola, Ex Officio Member (NFSC), Shaw Environmental & Infrastructure, Inc.

Caroline M. McAndrews, Member at Large, Southern California Edison

Charles H. Moseley, Member at Large, Individual

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

Tawfik M. Raby, Ex Officio Member (N17), National Institute of Standards and Technology

R. Michael Ruby, Member at Large, NFSC Vice Chair, Constellation Energy

Steven L. Stamm, Member at Large, Shaw Nuclear Services

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

Michael J. Wright, Member at Large, Entergy Nuclear South Grand Gulf

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Richard K. Blauvelt, ASTM C26 Liaison, Navarro Research & Engineering, Inc.

Nolan Hertel, NCRP & N13 Liaison, Georgia Institute of Technology

Calvin M. Hopper, Observer, Individual

Stanley H. Levinson, ASME Liaison, AREVA-NP

James H. Riley, NEI Liaison

Ex Officio Member = Consensus Committee Chair

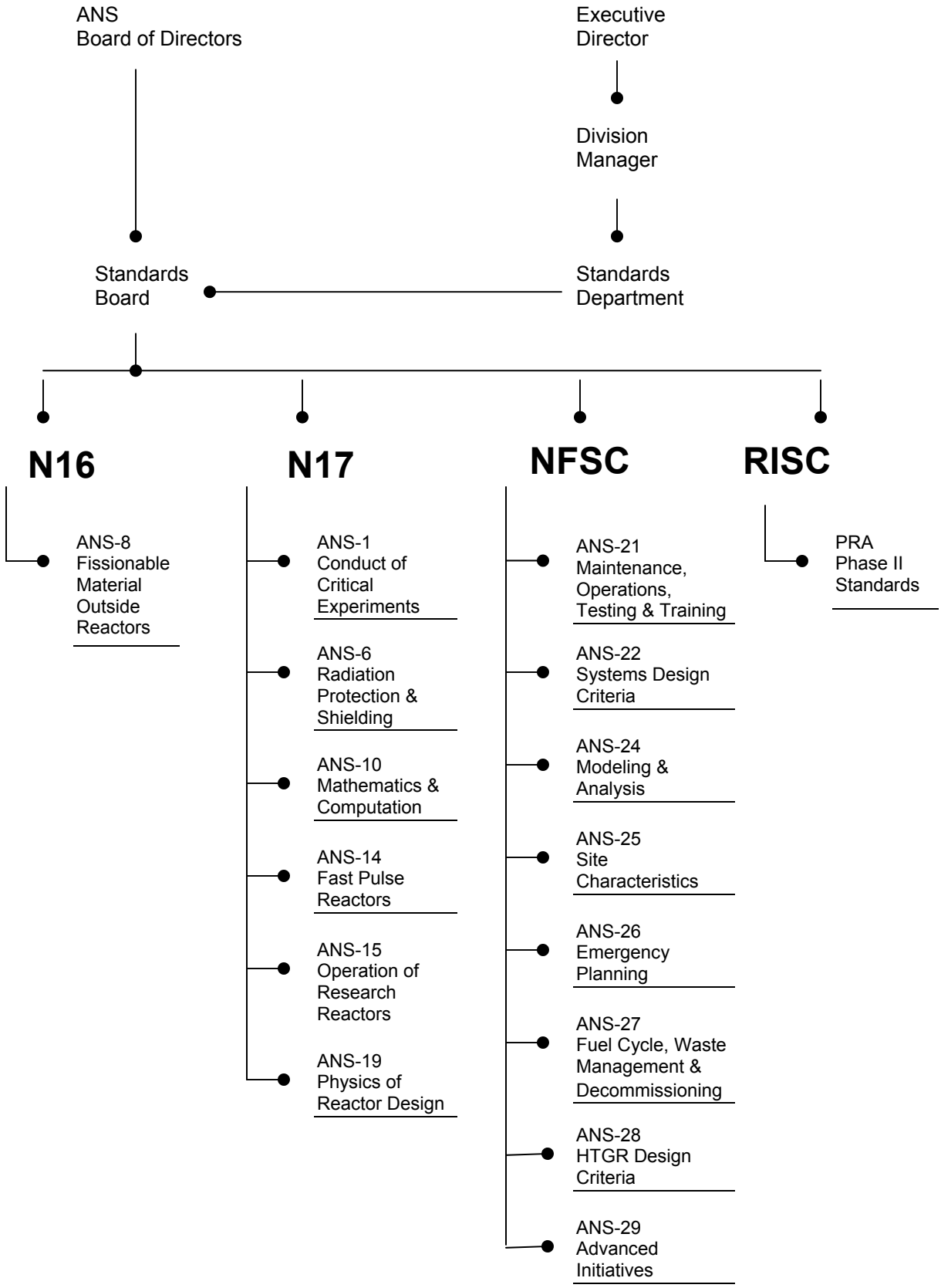

Figure 2 – ANS Standards Committee: Organizational Chart

SUBCOMMITTEES*
Chairmen

ANS-1	Conduct of Critical Experiments (N17)	T. R. Schmidt
ANS-6	Radiation Protection & Shielding (N17)	W. C. Hopkins
ANS-8	Fissionable Material Outside Reactors (N16)	D. Reed
ANS-10	Mathematics & Computation (N17)	A. O. Smetana
ANS-14	Fast Pulse Reactors (N17)	T. R. Schmidt
ANS-15	Operation of Research Reactors (N17)	S. O'Kelly
ANS-19	Physics of Reactor Design (N17)	D. Cokinos
ANS-21	Maintenance, Operations, Testing & Training (NFSC)	C. E. Carpenter
ANS-22	System Design Criteria (NFSC)	D. G. Newton
ANS-24	Modeling & Analysis (NFSC)	J. A. Wehrenberg
ANS-25	Site Characteristics (NFSC)	K. R. Bryson
ANS-26	Emergency Planning (NFSC)	E. Lloyd
ANS-27	Fuel Cycle, Waste Management & Decommissioning (NFSC)	D. R. Eggett
ANS-28	HTGR Design Criteria (NFSC)	J. K. August
ANS-29	Advanced Initiatives (NFSC)	D. J. Spellman

** The Risk Informed Standards Committee (RISC) does not have a subcommittee.*

APPROVED
AMERICAN NATIONAL STANDARDS
Developed by the ANS Standards Committee
(through December 2010)

ANS-1-2000; R2007	Conduct of Critical Experiments (reaffirmed 10/11/2007)
ANS-2.2-2002	Earthquake Instrumentation Criteria for Nuclear Power Plants (approved 11/21/2002)
ANS-2.10-2003	Criteria for the Handling and Initial Evaluation of Records from Nuclear Power Plant Seismic Instrumentation (approved 4/14/2003)
ANS-2.17-2010	Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants (approved 12/23/10)
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-3.2-2006	Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants (approved 7/31/2006)
ANS-3.4-1996; R2002	Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants (reaffirmed 7/23/2002)
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-5.10-1998; R2006	Airborne Release Fractions at Non-Reactor Nuclear Facilities (reaffirmed 11/6/2006)

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	Criticality Accident Alarm System (reaffirmed 6/12/2003)
ANS-8.5-1996; R2002; R2007	Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material (reaffirmed 5/14/2007)
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	Nuclear Criticality Safety in the Storage of Fissile Materials (reaffirmed 9/12/2007)
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	Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors (reaffirmed 3/20/2002)
ANS-8.14-2004	Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors (approved 5/25/2004)
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	Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors (reaffirmed 7/23/2001)
ANS-8.22-1997; R2006	Nuclear Criticality Safety Based on Limiting and Controlling Moderators (reaffirmed 12/8/2006)
ANS-8.23-2007	Nuclear Criticality Accident Emergency Planning and Response (approved 3/23/2007)
ANS-8.24-2007	Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations (approved 3/16/2007)
ANS-8.26-2007	Criticality Safety Engineer Training and Qualification Program (approved 6/20/2007)
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	Accommodating User Needs in Scientific and Engineering Computer Software Development (approved 4/17/2006)
ANS-14.1-2004; R2009	Operation of Fast Pulse Reactors (reaffirmed 10/27/2009)
ANS-15.1-2007	The Development of Technical Specifications for Research Reactors (approved 4/20/2007)
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	Quality Assurance Program Requirements for Research Reactors (reaffirmed 9/14/2005)
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	Nuclear Data Sets for Reactor Design Calculations (approved 7/23/2002)
ANS-19.3-2005	Determination of Steady State Neutron Reaction Rate Distributions and Reactivity of Nuclear Power Reactors (approved 9/16/2005)
ANS-19.3.4-2002; R2008	The Determination of Thermal Energy Deposition Rates in Nuclear Reactors (reaffirmed 10/31/2008)
ANS-19.6.1-2005	Reload Startup Physics Tests for Pressurized Water Reactors (approved 11/29/2005)
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	Calculations and Measurement of the Moderator Temperature Coefficient of Reactivity for Water Moderated Power Reactors (reaffirmed 12/17/2002)
ANS-40.37-2009	Mobile Low Level Radioactive Waste Processing Systems (approved 11/20/2009)
ANS-51.10-2002; R2008	Auxiliary Feedwater System for Pressurized Water Reactors (reaffirmed 10/14/2008)
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	Containment System Leakage Testing Requirements (approved 11/27/2002)
ANS-57.1-1992; R1998; R2005	Design Requirements for Light Water Reactor Fuel Handling 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	Fuel Assembly Identification (reaffirmed 1/12/2005)
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-58.6-1996; R2001	Criteria for Remote Shutdown for Light Water Reactors (reaffirmed 8/31/2001)
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-58.11-1995; R2002	Design Criteria for Safe Shutdown Following Selected Design Basis Events in Light Water Reactors (reaffirmed 7/23/2002)
ANS-59.3-1992; R2002	Nuclear Safety Criteria for Control Air Systems (reaffirmed 8/30/2002)
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)

N16
Nuclear Criticality Safety

Robert D. Busch
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.

N16 Membership:

Robert D. Busch, Chair, University of New Mexico
Larry L. Wetzel, Vice Chair, Babcock & Wilcox Nuclear Operations Group
William R. Shackelford, (Secretary Pro Temp), Nuclear Fuel Services, Inc.
George H. Bidinger, Individual
Robert S. Eby, AIChE Representative (employed by USEC)
Calvin M. Hopper, Individual
Ronald A. Knief, INMM Representative (employed SNL)
Calvin D. Manning, AREVA NP
Thomas Marenchin, U.S. Nuclear Regulatory Commission
Scott P. Murray, HPS Representative (employed by General Electric Co.)
Ronald E. Pevey, University of Tennessee
Davis A. Reed, Oak Ridge National Laboratory
Raymond L. Reed, URS Safety Management Solutions, LLC
Burton M. Rothleder, U.S. Department of Energy
Richard G. Taylor, INM Nuclear Safety Services.
R. Michael Westfall, Oak Ridge National Laboratory
Robert E. Wilson, U.S. Department of Energy

Report of N16

The N16 Nuclear Criticality Safety Committee met at the 2010 ANS Winter Meeting in Las Vegas, Nevada, on November 6, 2010. Robert D. Busch was elected as the fourth chair of the N16 Committee replacing Calvin M. Hopper who held the position since 2000. Larry Wetzel was elected N16 Vice Chair replacing Ronald Knief.

Approved in 2010

ANSI/ANS-8-6-1983; R1988; R1995; R2001; R2010 "Safety in Conducting Subcritical Neutron-Multiplication Measurements in Situ" (reaffirmation)

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)

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

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

Subcommittee 8 – Fissionable Material Outside Reactors

(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.

ANS-8 Membership:
Davis A. Reed, Chair, Oak Ridge National Laboratory
Brian Kidd, Vice Chair, Babcock & Wilcox Nuclear Operations Group
Michael Crouse, Secretary, Washington Safety Management Solutions, LLC
Francis Alcorn, Individual
James Baker, Los Alamos National Laboratory
Adolf Garcia, U.S. Department of Energy
Thomas McLaughlin, Los Alamos National Laboratory
Dennis Morey, U.S. Nuclear Regulatory Commission
Thomas Reilly, Individual
Hans Toffer, Individual

Elliott Whitesides, Individual
Dominic Winstanley, Sallafield Ltd.

Report:
Neil Harris withdrew from membership in the ANS-8 Subcommittee and was replaced by Dominic (Fred) Winstanley of Sallafield. James Baker of Los Alamos National Laboratory was added as a member. The ANS-8 Subcommittee held a standards forum at each of the two annual ANS conferences, San Diego in June 2010, and Las Vegas in November 2010.

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, Los Alamos National Laboratory; Nicholas Brown, Co-Chair, Nuclear Fuel Services; Rob Beck, Paducah Gaseous Diffusion Plant; Mike Corum, Nuclear Safety Assoc.; Adolf Garcia, U.S. Department of Energy; Sedat Goluoglu, ORNL; Clint Gross, Paschal Solutions; Chris Haught, BWXT Y12; David Heinrichs, Lawrence Livermore National Laboratory; Jerry Hicks, U.S. Department of Energy; Richard Lell, Argonne National Laboratory; Maria LeTellier, CE Engineering; John Miller, Sandia National Laboratories; Lee Montierth, Idaho National Laboratory; Dennis Morey, U.S. Nuclear Regulatory Commission; James Morman, Argonne National Laboratory; Lane Paschal, Paschal Solutions, Inc.; Lon Paulson, GNF; Kevin Reynolds, BWXT Y12; Ellen Saylor, ORNL; Fred Winstanley, British Nuclear Fuels; 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. In December 2009, a clarification was published in Nuclear News to address an inquiry regarding the relationship and meaning of the Process Analysis requirement (Section 4.1.2) and the Double Contingency Principle recommendation (Section 4.2.2). The revision is focused on editorial clarifications and enhancements to the current content including incorporating information from the clarification. The revision will also consider new subcritical limits for uranium metal and compounds for enrichments up to 10 wt. % ^{235}U. A tentative list of uranium compounds have been proposed for the new calculations: UO_2F_2, UF_4, UF_6, U_3O_8, and UO_2. Four working group meetings, two at the ANS Summer meeting in San Diego, CA, and another two at the ANS Winter meeting in Las Vegas, NV, were convened to work on the revision and calculation efforts. Monthly telephone conferences have also been initiated to speed up progress on the revision.

ANSI/ANS-8.3-1997; R2003, "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:
Shean Monahan, Chair, Los Alamos National Laboratory; Richard Anderson, Los Alamos National Laboratory; Peter Angelo, BWXT Y-12; Debdas Biswas, Lawrence Livermore National Laboratory; Warner Blyckert, Mohr and Associates; Wesley Don Dotson, AREVA NP; Ed Kendall, DOE YSO (Y-12 NSC); Clinton King, BWXT Lynchburg; Bill Lee, BWXT Y-12; John McMahan, Westinghouse Savannah River Co.; Ron Pevey, University of Tennessee; Tamara Powell, U.S. Nuclear Regulatory Commission; Valerie Putman, Idaho National Laboratory; Davis Reed, Oak Ridge National Laboratory

Status: Reaffirmation received ANSI approval 6/12/2003. The working group has embarked on a line-by-line revision of the standard with objectives to 1) update the standard in recognition of the content and role of ANSI/ANS-8.23, 2) address lessons learned from use of the current version, and 3) address N16 and public review comments received during the 2003 reaffirmation. The goal is to make the standard self-consistent and consistent with other ANSI/ANS-8 standards. One meeting of the working group was held at the San Diego summer ANS 2010 Annual Meeting. Progress has been slow with about 1/8th of the standard having been reviewed and altered to date. A reaffirmation of this standard is being considered to keep this standard current while the revision is completed.

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; Christopher Tripp, U.S. Nuclear Regulatory Commission; Robert Wilson, U.S. Department of Energy; Robert Rothe, Individual; Carol Cise, Nuclear Associates

Status: Reaffirmation received ANSI approval 5/14/2007. This standard is being incorporated into ANS-8.21. As it will be some time before ANS-8.21 is completed, a reaffirmation of this standard may need to be considered in 2012.

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; 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. ANS-8.6 was reaffirmed with comments in 2010; the comments will be reviewed and incorporated during the next review cycle as part of the update.

ANSI/ANS-8.7-1998; R2007, "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, USNRC

Status: Reaffirmation received ANSI approval 9/12/2007. There has been no activity since the 2007 reaffirmation. Recruiting for new working group members will be done in 2011.

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:
Linda M. Farrell, Chair, AREVA NP, Inc.; Warner Blyckert, Individual; Ernest Elliott; Defense Nuclear Facilities Safety Board; Darby Kimball, Bechtel; Thomas Marenchin, U.S. Nuclear Regulatory Commission; Pran Paul, U.S. Department of Energy-Y12; Andrew Prichard, Pacific Northwest National Laboratory; Todd Taylor, Idaho National Laboratory

Status: A reaffirmation received ANSI approval 4/1/2005. The working group met at the 2010 ANS Winter Meeting to discuss updates that are needed. A revision is in the process.

ANSI/ANS-8.12-1987; R1993; R2002, "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; Dennis Mennerdahl, EMS-Sweden; Lester Petrie, Oak Ridge National Laboratory; Burton Rothleder, U.S. Department of Energy; Christopher Tripp, U.S. Nuclear Regulatory Commission; Scott Revolinski, Nuclear Safety Associates; Dominic Winstanley, Sellafield-UK

Status: ANS-8.12 was first published in 1978, and it obtained its latest reaffirmation on 3/20/2002. The standard is going through another reaffirmation at this time and reaffirmation is expected in early 2011. The reaffirmation is necessary to retain ANS-8.12 as a current standard while the revision is being completed. A PINS was approved in 2007 for the revision of this standard. The working group is currently working to extend the areas of applicability by providing a wider range of subcritical data. 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. Substantial progress was made in generating subcritical limits by Monte Carlo calculations using the ISO MOX specifications. Work is ongoing to select critical benchmark experiments for validation.

ANSI/ANS-8.14-2004, "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: Received ANSI approval 5/25/2004. No recent working group activity.

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; Angela Clayton, Atomic Weapons Establishment-United Kingdom; Hiroshi Okuno, Japan Atomic Energy Research Institute; Michael Westfall, Oak Ridge National Laboratory; Kenneth Yates, Savannah River Company

Status: Reaffirmation received ANSI approval 7/15/2005. The working group completed a draft revision of the standard in August 2010; the draft then went out for ballot by ANS-8. There were a number of negative ballots in the areas of 1) references and 2) eliminating material from the current standard. These areas will be addressed by the working group in the coming months.

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 Kidd, Chair, Babcock & Wilcox Nuclear Operations Group; Dale Lancaster, NuclearConsultants.com; Calvin Manning, AREVA; Christian Fisher, U.S. Nuclear Regulatory Commission; Cecil Parks, Oak Ridge National Laboratory; Stanley Turner, Holtec International

Status: Reaffirmation received ANSI approval on 9/14/2009. There has been no current activity.

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, NISYS A Division of ENERCON; Bill Anderson, AREVA; Jim Baker, Los Alamos National Laboratory; Tom Marenchin, US Nuclear Regulatory Commission

Status: This standard was approved by ANSI on 5/16/2005. A PINS form for a revision was approved in 2007. The working group met in June 2010 in Lynchburg, Virginia. A draft was completed and reviewed by the ANS-8 Subcommittee. The working group met again in December 2010 to address the comments received from the ANS-8 review.

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; Allison Barber, Sandia National Laboratories; Paul Burdick, Washington Safety Management Solutions; Doug Harris, Washington Safety Management Solutions; Christopher Haught, B&WY-12; Deborah Hill, National Nuclear Laboratory (UK); Jesse McBurney-Rebol, Bechtel Marine Propulsion Corp.; Dennis Morey, U.S. NRC; Valerie Putman, Idaho National Laboratory; Christine Racicot, 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. The working group met in June and November 2010 at the ANS Meetings in San Diego and Las Vegas, respectively. The new PINS was submitted, approved by ANS-8 (with comments) and N-16, and is awaiting Standards Board approval. We continue to focus on defining representative nuclear facility constituencies for NCS training and identifying associated training content requirements and recommendations. The working group plans to convene during both of the 2011 ANS national meetings.

ANSI/ANS-8.21-1995; R2001, "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. NRC

Status: Reaffirmation received ANSI approval 7/23/2001. A revised PINS incorporating ANS-8.5 into ANS-8.21 was approved by all required entities and submitted to ANSI on 2/12/2008. The working group met twice during 2010 (at both ANS meetings) with two primary focuses. The first was a focus on reaffirmation to keep the standard current while a revision was completed. The process to reaffirm was started with initiation of an ANS-8 Subcommittee ballot resulting in a few comments to be considered for incorporation in the revision. A reaffirmation ballot will be issued to the N16 Committee in early 2011. Once reaffirmation is granted, the PINS for revision will be resubmitted. The second focus was on continuing the editing of the new version of ANS-8.21. The draft was reviewed multiple times and significant discussion took place to ensure the appropriate focus was maintained. It has been decided that the text of ANS-8.5 will be included in the standard as an

appendix. The revised version of the fixed neutron absorber standard will have text changes and several example appendices; the appendices are now being drafted.

ANSI/ANS-8.22-1997; R2006, "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, Washington Safety Management Solutions; Marvin Barnett, URS Safety Management Solutions; Donna D'Aquila, PORTS; Sean Gough, Westinghouse Electric Company; Chris Haught, Y-12; Deborah Hill, NNL, UK; Robert Maurer, Nuclear Fuel Services; Thomas Marenchin, NRC; Rahn Ross, SRS; Burton Rothleder, U.S. DOE; Richard Stachowiak, Fluor Government Group

Status: Reaffirmation received ANSI approval on 12/8/2006. The working group held one meeting at the 2010 ANS Winter Meeting in Las Vegas, Nevada. Although a revision is planned, the working group has decided to pursue reaffirmation to allow more time to complete the revision to the standard.

ANSI/ANS-8.23-2007, "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, is in use.

This standard does not apply to nuclear power plant sites, or to those licensed research reactor facilities, which are addressed by the provisions of other standards. This standard does not apply to offsite accidents, or offsite emergency planning and response.

Membership:
James Baker, Chair, Los Alamos National Laboratory; Peter Angelo, Y-12 National Security Complex; Bill Carson, NISYS; Neil Harris, BNFL; Tracey Henson, USEC; Calvin Hopper, Individual; George Lim, AECL Chalk River Laboratories; Valerie Putman, Idaho National Laboratory; Raymond Reed, Washington Safety Management Solutions; Ludovic Reverdy, CEA Valduc, France

Status: Reaffirmation received ANSI approval 3/23/2007. 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 and revision. But with our encouragement, the Health Physics Society has recently revived that effort. Dann Ward of Sandia National Laboratories is the new chair of the N13.3 Working Group. He is currently recruiting working group members. ANS-8.23 Working Group Chair James Baker will act as liaison between the ANS-8.23 and N13.3 working groups. Therefore, ANSI/ANS-8.23 will be maintained (reaffirmed as appropriate) pending completion of the new N13.3. Other suggestions and comments on ANSI/ANS-8.23 that the working group has received, including those from the last ANS-8 and N16 balloting, will be addressed at that time. The ANS-8.23 Working Group does not need new members at this time.

ANSI/ANS-8.24-2007, "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:

Robert Busch, Chair, University of New Mexico; Jack Bullington, Washington Safety Management Solutions LLC; Chuck Harmon, Los Alamos National Laboratory; Jerry Hicks, U.S. DOE; Kevin Kimball, Enercon Services; Dennis Morey, U.S. Nuclear Regulatory Commission; Cecil Parks, Oak Ridge National Laboratory; Andy Prichard, Pacific NW National Laboratory; Burt Rothleder, U.S. DOE; Robert Tayloe, R. Tayloe Engineering Consultancy, Inc.; Chris Tripp, U.S. Nuclear Regulatory Commission; Fitz Trumble, Washington Safety Management Solutions; Larry Wetzel, Babcock & Wilcox Nuclear Operations Group

Status: New standard received ANSI approval 3/16/07. There has been no activity in 2010 with this standard, however, the ANS-8.24 Working Group will gather information on the usefulness of the standard and will likely have a meeting in the spring of 2011 to start looking at a revision.

ANS-8.25, "Development of Nuclear Criticality Safety Related Postings" (new standard)

Scope:

From 2006 unapproved draft PINS: This standard provides a basic reference source to aid industry and governmental agencies in providing criteria and guidance on the proper development and placement of Nuclear Criticality Safety (NCS) limits and related postings for maximum effectiveness. The factors that may impinge on safety effectiveness must be considered in the final operational use of NCS limits and related postings.

Membership:

Gerard Couture, Chair, Westinghouse Electric Company; Chris Haught, BWX Technologies, Inc.; Mark Jensen, Flour Hanford Company; Amadeo Ramos, CH2M-WG-Idaho, LLC; Rachel E. (Beth) Vail, Washington Safety Management Solutions

Status: Consideration is being given to terminate this project.

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

Scope:

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; Warner Blyckert, Mohr and Associates; Kevin Carroll, BWXT Y12 LLC; Lawrence Livermore National Laboratory; Mayme Crowell, Individual; James Felty, U.S DOE; Adolf Garcia, US DOE NE-ID; Calvin Hopper, Individual; Steve Kessler, Lawrence

Livermore National Laboratory; Ronald Knief, Sandia National Laboratories; Bill Lee, U.S. DOE; Jerry McKamy, U.S. DOE; Lon Paulson, GNF; Ronald Pevey, University of Tennessee - Nuclear Engineering Dept.; Chad Pope, Idaho National Laboratory; Tamara Powell, U.S. Nuclear Regulatory Commission; Christa Reed, BWX Technologies, Inc.; Kevin Reynolds, BWXT Y12 LLC; Bonnie Rumble, Enercon Services; Norm Schwers, Sandia National Laboratories; Jim Stewart, Department for Transport - UK; Fitz Trumble, Washington Safety Management Solutions; Robert Wilson, U.S. DOE

Status: Received ANSI approval as a new standard 6/20/07. The working group met during the June 2010 ANS meeting. Thirteen members of the working group were present plus two visitors. No comments or suggested improvements to ANS-8.26 have been received by any of the working group members. Minor changes were suggested by members at the meeting, including one to make the words related to safety basis documents more generic. It was suggested to check with ANS-8 or N16 to determine the best way to handle such a minor change. The reaffirmation or revision process for ANS-8.26 will be initiated in early 2011.

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; Kris Cummings, Westinghouse; Mark DeHart, INL; Michael DeVoe, Progress Energy Carolinas; Jill Fisher, Exelon Corp.; Jim Gulliford, Nexia Solutions; 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; Richard McKnight, Argonne National Laboratory; 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; Charlotta Sanders, Westinghouse; Dan Thomas, AREVA NP; John Wagner, ORNL; Chris Walker, Entergy; Alan Wells, EPRI; Kent Wood, NRC; Al Zimmer, General Atomics; John Zino, GE Nuclear

Status: This standard received ANSI approval on 8/14/2008. The working group is slowly working toward application examples for appendices. Although the working group did not meet in 2010, significant e-mail communications have been used to move forward with the appendices.

ANS-8.28, "Administrative Practices for the Use of Non-Destructive Assay Measurements for Nuclear Criticality Safety" (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:

Jerry McKamy, Chair, U.S. Department of Energy; Larry Berg, U.S. DOE; Mikey Brady Raap, PNNL; David Dolin, SRS; Nichole Ellis, Individual; Brian Keele, Hanford; Frank Lamb, Individual; Tom Nirider, U.S. DOE; Bob Wilson, U.S. DOE; John Winkel, Hanford

Status: The PINS has been approved by ANS-8 and N16. Comments from the Standards Board review are being considered and the PINS should be submitted to ANSI in early 2011. The original working group roster was formed back in 2009, and we have been awaiting approval to begin work. Some additional representation from NRC and other interested parties will be sought to augment the current working group.

ANS-8.29, "Nuclear Criticality Safety in Fuel Reprocessing Facilities" (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; Nick Schira, Co-Vice Chair, URS; Joseph Christensen, Co-Vice Chair, U.S. Department of Energy; Brian Collins, PNL; Matthieu Duluc, IRSN; Eric Guillou, AREVA; Jerry Hicks, DOE; Dennis Mennerdahl, EMS; John Miller, Sigma Science; Leland Montierth, INL; Morman, ANL; Andrew Prichard, PNL; Thomas Reilly URS; James Rendell, Sellafield; Ellen Saylor, ORNL; Wade Scates, INL; Timothy Sippel, NRC; Hans Toffer, Individual; Christopher Tripp, NRC; Mike White, KAPL; Robert Wilson, DOE; Dominic Winstanley, Sellafield

Status: The PINS ballot was sent to the ANS-8 Subcommittee for approval. The working group is preparing consensus answers to questions discussed during the last ANS-8 meeting, in preparation for the comment resolution phase (to start immediately after the ballot results are received). The original working group was formed back in 2008 and remained unchanged until the last few meetings when it grew to its present size. It is rather large, but this was done on purpose because the large amount of work necessary to collect existing data that will be used as basis for the intended guidance. The working group membership is now practically closed, with the exception that additional representation from South Korea, Japan, Russia, and AREVA are still being sought. We are awaiting approval of the PINS.

N17
Research Reactors, Reactor Physics, Radiation Shielding and Computational Methods

Tawfik M. Raby, Chair
National Institute of Standards and Technology

Scope:

To develop standards for the location, design, construction, operation, and maintenance of all nuclear reactors for training and research, both as mechanisms for investigating reactors per se and as sources of radiation, and excluding reactors designed for the production of electrical energy; standards for the location, design, construction, operation, and maintenance of critical facilities; standards for calculational methods and computer codes for use in nuclear-reactor and reactor-physics calculations, including shielding. Inputs into calculations and codes, such as nuclear cross sections, are included in this scope.

The N17 consensus committee supervises the work of six subcommittees. These are as follows:

ANS-1, Conduct of Critical Experiments
ANS-6, Radiation Protection and Shielding
ANS-10, Mathematics and Computation
ANS-14, Fast Pulse Reactors
ANS-15, Operation of Research Reactors
ANS-19, Physics of Reactor Design

N17 Membership:

Tawfik M. Raby, Chair, National Institute of Standards and Technology
Abraham Weitzberg, Vice Chair, Individual
Stanwood Anderson, Westinghouse
William H. Bell, AIChE Representative (employed by South Carolina Electric & Gas Co.)
Richard Brey, HPS Representative (employed by Idaho State University)
Robert E. Carter, Individual
Dimitrios M. Cokinos, Brookhaven National Laboratory
Michael L. Corradini, NCRP Representative (employed by University of Wisconsin-Madison)
Brian K. Grimes, Individual
Nolan Hertel, Georgia Institute of Technology
Chris Heysel, McMaster University
William C. Hopkins, Individual
Matthew A. Hutmaker, U.S. Department of Energy
Andrew Kadak, Massachusetts Institute of Technology
Laurence I. Kopp, Individual
Patrick M. Madden, U.S. Nuclear Regulatory Commission
James F. Miller, IEEE Representative (employed by James F. Miller Consulting Services)
Thomas J. Myers, National Institute of Standards Technology
Jack E. Olhoeft, Individual
Ronald E. Pevey, University of Tennessee
Sean O'Kelly, National Institute of Standards Technology
Charles Rombough, CTR Technical Services
Theodore R. Schmidt, Sandia National Laboratories
Andrew O. Smetana, Savannah River National Laboratory
Ray Tsukimura, Aerotest Operations
Anthony R. Veca, General Atomics

Alternates:
Alexander Adams (for Patrick Madden), U.S. Nuclear Regulatory Commission
Seymour H. Weiss (for Thomas Myers), National Institute of Standards and Technology
Robert D. Zimmerman (for William Bell), American Institute of Chemical Engineers

Report of N17

After more than 30 years of ANS standards work, Wade Richards retired as ANS-15 Subcommittee Chair in May 2010. Sean O'Kelly accepted the position of ANS-15 Subcommittee Chair and assumed his ex officio position on the N17 Consensus Committee.

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

ANS-6.1.2, "Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants" (revision of ANSI/ANS-6.1.2-1994; R2009)

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

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

ANS-10.7, "Non-Real Time, High Integrity Software for the Nuclear Industry" (new standard)

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

ANS-15.8, "Quality Assurance Program Requirements for Research Reactors" (revision of ANSI/ANS-15.8-1995; R2005 – new standard)

ANS-15.17, "Fire Protection Program Criteria for Research Reactors" (historical revision of ANSI/ANS-15.17-1981; R1987; R2000)

ANS-15.19, "Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor Facilities" (historical revision of ANSI/ANS-15.19-1991 – new standard)

ANS-15.20, "Criteria for the Reactor Control and Safety Systems of Research Reactors" (new standard)

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

ANS-19.1, "Nuclear Data Sets for Reactor Design Calculations" (revision of ANSI/ANS19.1-2002)

ANS-19.3, "Determination of Steady State Neutron Reaction Rate Distributions and Reactivity of Nuclear Reactors" (revision of ANSI/ANS-19.3-2005)

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

ANS-19.9, "Delayed Neutron Parameters for Light Water Reactors" (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; R2002)

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

Subcommittee ANS-1 – Conduct of Critical Experiments

This subcommittee oversees a single project, ANSI/ANS-1-2000 (R2007). The members of the subcommittee are also the members of the working group.

Membership:
Theodore Schmidt, Chair, Sandia National Laboratories
Robert Busch, University of New Mexico
Ronald Knief, Sandia National Laboratories
Thomas McLaughlin, Los Alamos National Laboratory
Richard Paternoster, Los Alamos National Laboratory
Steven Payne, U.S. Department of Energy
Jeffrey Philbin, Sandia National Laboratories
Robert Seale, University of Arizona
Abraham Weitzberg, Individual

ANSI/ANS-1-2000; R2007, "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, Los Alamos National Laboratory; Richard Paternoster, Los Alamos National Laboratory; Steven Payne, U.S. Department of Energy; Jeffrey Philbin, Sandia National Laboratories; Robert Seale, University of Arizona; Abraham Weitzberg, Individual

Status: Reaffirmation received ANSI approval 10/11/07. No activity in 2010, but we anticipate seeking reaffirmation again in 2012.

Subcommittee ANS-6 – Radiation Protection and Shielding

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:
William Hopkins, Chair, Individual
Arzu Alpan, Westinghouse Electric Company
Richard Faw, Individual
Nolan Hertel, Georgia Institute of Technology
Jeffrey C. Ryman, Chair, Bechtel SAIC
Jennifer Tanner, Pacific Northwest National Laboratory
Michael Westfall, Oak Ridge National Laboratory

ANS-6 manages the following active projects and current standards:

ANS-6.1.1, "Neutron and Gamma-Ray Fluence-To-Dose Factors" (historical revision of ANSI/ANS-6.1.1-1991 – 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:
Nolan Hertel, Chair, Georgia Institute of Technology

Status: This standard was withdrawn in 2001. The working group chair is considering options for a revision.

ANSI/ANS-6.1.2-1999; R2009, "Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants" (revision of ANSI/ANS-6.1.2-1989)

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, University of Florida; Robert Little, Los Alamos National Laboratory; Yuri Orechwa, U.S. Nuclear Regulatory Commission; Jeffrey Ryman, URS Corporation; Mark Williams, Oak Ridge National Laboratory

Status: A reaffirmation was approved by ANSI on 2/23/2009. Work continues on the revision.

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:
Jennifer Tanner, Chair, Pacific Northwest National Laboratory

Status: Reaffirmation received ANSI approval 4/20/07.

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:
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: ANSI/ANS-6.4-2006 received ANSI approval 9/29/2006. No activity in 2010. Richard Faw retired as working group chair but will continue to support this project as a working group member.

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; Timothy Lloyd, Westinghouse Electric Company; Kenneth Shultis, Kansas State University; Nancy Willoughby, New York City Department of Design & Construction

Status: ANSI/ANS-6.4.2-2006 received ANSI approval 9/28/2006. Richard Faw retired as working group chair but will continue to support as a working group member. Steven Nathan agreed to take over as working group chair. No activity in 2010, but the working group anticipates seeking reaffirmation in 2011.

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

OLD Scope:
This standard presents evaluated gamma-ray elemental attenuation coefficients and single-material buildup factors for selected engineering materials for use in shielding calculations of structures in power plants and other nuclear facilities. The data cover the energy range 0.015-15 MeV and up to 40 mean free paths (mfp). These data are intended to be standard reference data for use in radiation analyses employing point-kernel methods.

Membership:
Jeffrey C. Ryman, Chair, Bechtel SAIC; F. Arzu Alpan, Westinghouse Electric Company; Keith Eckerman, ORNL; Richard Faw, Retired; George Xu, RPI; S. R. Manohara, Shridevi Institute of Engineering and Technology; Charlotta E. Sanders, Westinghouse Electric Company/UNLV

Status: A PINS is being drafted to initiate a revision to the historical standard.

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

Status: Reaffirmation received ANSI approval 3/5/2007. Dick Amato accepted the position of chair. Members are being recruited. A reaffirmation will be sought in 2012.

Subcommittee ANS-10 – Mathematics and Computation

Scope:
The scope of the ANS-10 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:
Andrew Smetana, Chair, Savannah River National Laboratory
Mark Baird, Radiation Safety Information Computational Center
Phillip Ellison, GE-Hitachi
Charles Martin, Defense Nuclear Facilities Safety Board
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

ANS-10 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
Balance of membership OPEN

Status: A reaffirmation was approved by ANSI on 8/14/2009. No activity in 2010.

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

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

Membership:
Edward (Ted) Quinn, Chair, Longenecker and Associates
Balance of membership OPEN

Status: The intent is to start a revision to this withdrawn standard. Working group members need to be recruited. No activity in 2010 but plans to assemble a technical expert core team in the coming year.

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; Bernadette Kirk, Oak Ridge National Laboratory; Jennifer Manneschmidt, Oak Ridge National Laboratory; Charles Martin, Defense Nuclear Facilities Safety Board; Keith Morrell, Westinghouse Savannah River Company

Status: This standard was approved 10/28/2008. No current activity in 2010.

ANSI/ANS-10.5-2006, "Accommodating User Needs in Computer Program 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; Bernadette Kirk, Oak Ridge National Laboratory; Jennifer Manneschmidt, Oak Ridge National Laboratory; Charles Martin, Defense Nuclear Facilities Safety Board; Keith Morrell, Westinghouse Savannah River Company

Status: The revision received ANSI approval 4/17/06. No current activity in 2010.

ANS-10.7, "Non-Real Time, High Integrity Software for the Nuclear Industry" (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:
Charles Martin, Chair, Defense Nuclear Facilities Safety Board; Forrest Brown, Los Alamos National Laboratory; Robert Busch, University of New Mexico; Phillip Ellison, GE-Hitachi; Ahmad Haidari,

ANSYS Corp; Paul Hulse, Sellafield Ltd.; Keith Morrell, Westinghouse Savannah River Company; Bradley T. Rearden, Oak Ridge National Laboratory; Bill Rider, Sandia National Laboratories; Shivaji Seth, U.S. Department of Energy; John R. Shultz, U.S. DOE; Robert Singleterry, NASA Langley Research Center; Andrew Smetana, Savannah River National Laboratory; Jin Yan, Westinghouse Electric Company

Status: Because of the potential consequences of errors and the difficulty of timely detection and correction of errors in such software, this standard will need to go beyond verification and validation to include both quality assurance and technical provisions not currently found in ANS-10.4. The working group met four times this year: April 15-16, 2010, in Wilmington, North Carolina; June 12, 2010, in San Diego, California; August 9-10, 2010, at the University of New Mexico in Albuquerque, New Mexico; and November 6, 2010, in Las Vegas, Nevada. The working group also held periodic teleconferences throughout the year. The working group has completed its review of the final draft for the standard and now plans to forward the draft to the full ANS-10 Subcommittee for comment in preparation for balloting in early 2011.

Subcommittee ANS-14 – Fast Pulse Reactors

Scope:

The aim of this committee is to establish standards for the safe and responsible design and operation of fast burst reactors, including performance of associated experimental programs and maintenance operations.

ANS-14 oversees one standard. The members of the subcommittee and the working group are the same.

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, Individual
Ronald Knief, Sandia National Laboratories
Douglas Minnema, National Nuclear Security Administration
Gerald Schlapper, National Nuclear Security Administration

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; Rondal 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.

Subcommittee ANS-15 – Operation of Research Reactors

Scope:

The purpose of this committee is to develop, prepare, and maintain standards for the design, construction, operation, maintenance, and decommissioning of nuclear reactors intended for research and training. The reactor may be used for research per se, or as a source of radiation for experimental purposes. Excluded are pulse reactors comprised of unmoderated fissile material in which fissions are produced predominately by high energy fissions.

Membership:

Sean O'Kelly, Chair, National Institute of Standards and Technology
Alexander Adams, U.S. Nuclear Regulatory Commission
Leo Bobek, University of Massachusetts – Lowell
James Bryson, Sandia National Laboratories
Clinton Dana Cooper, Idaho National Laboratory
Les Foyto, University of Missouri – Research Reactor Center
Max Gildner, Oak Ridge National Laboratory
Michael Krause, University of Texas
Charles McKibben, University of Missouri – MURR
Steve Miller, AFRRI/NNMC
Thomas Myers, National Institute of Standards and Technology
Steve Reese, Oregon State University
Theodore Schmidt, Sandia National Laboratories
John Sease, Oak Ridge National Laboratory
Marcus H. Voth, U.S. Nuclear Regulatory Commission

ANS-15 manages the following current standards and active projects:

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:

Theodore Schmidt, Co-Chair, Sandia National Laboratories; Alexander Adams, Jr., Co-Chair, U.S. Nuclear Regulatory Commission; Sean O'Kelly, National Institute of Standards and Technology; Tawfik Raby, National Institute of Standards and Technology

Note: Many members of the ANS-15 Subcommittee made significant contributions to the current version of this standard.

Status: Revision approved by ANSI 4/20/07. No current activity. We anticipate seeking reaffirmation in 2012.

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:
John Sease, Co-Chair, Oak Ridge National Laboratory; Clinton Dana Cooper, Co-Chair, Idaho National Laboratory

Status: A reaffirmation was approved by ANSI 3/23/09. The reaffirmation was processed to allow sufficient time for the revision to be completed. The high power, reduced enrichment, aluminum plate fuel development is not complete. No action should be taken until the fuel form for high power aluminum plate fuel reactors has been approved. Incorporation of the information along with a complete editorial review should be the next revision for this standard.

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; Donald Feltz, Individual; Aaron Heinrich, South Texas Project Nuclear Operating Co.; Christopher Heysel, McMaster University; Daniel Hughes, U.S. Nuclear Regulatory Commission; Mathew Hutmaker, U.S. Department of Energy; Sean O'Kelly, National Institute of Standards and Technology; Wade Richards, National Institute of Standards and Technology; Tawfik Raby, National Institute of Standards and Technology; Theodore Schmidt, Sandia National Laboratories; Robert Seale, University of Arizona

Status: Revision received ANSI approval 8/17/2007. No recent working group activity necessary.

ANSI/ANS-15.8-1995; R2005, "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:
William Schuster, Chair, National Institute of Standards and Technology; Dana Cooper, INL; Max L. Gildner, ORNL; Marcus Voth, U.S. Nuclear Regulatory Commission

Status: Reaffirmation received ANSI approval 9/12/2005. Periodic maintenance review was delayed pending a review and issuance of an updated NRC Regulatory Guide 2.5, "Quality Assurance Program Requirements for Research and Test Reactors (June 2010)." This Regulatory Guide constitutes an endorsement of the ANS-15.8-1995; R2005 standard. Comments received by NRC during the public comment period of Regulatory Guide 2.5 will be considered during the maintenance review of ANS-15.8.

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; Dave Brown, National Institute of Standards and Technology; Stephen Frantz, Reed College—Portland, Oregon; Scott Menn, Oregon State University; Donna O'Kelly, National Institute of Standards and Technology

Status: ANSI approval received 10/8/2009. There are no plans to review or change the document in the coming year.

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:
Max Gildner, Chair, Oak Ridge National Laboratory

Status: This standard received ANSI approval 9/23/2008. No activity in 2010.

ANS-15.17, "Fire Protection Program Criteria for Research Reactors" (historical revision of ANSI/ANS-15.17-1981; R1987; R2000)

Scope:
This standard provides criteria for a fire protection program for research reactor facilities and for the reactor safety-related systems included in those facilities. It stresses preservation of the capability to

achieve and maintain safe shutdown of the reactor, and includes consideration of both direct fire hazards and indirect or consequential hazards.

Membership:
OPEN

Status: ANSI/ANS-15.17-1981; R1987; R2000 was administratively withdrawn on 5/3/2010. The 2009 ballot of the revision to ANSI/ANS-15.17-1981; R1987; R2000 resulted in significant comments that included a few negatives. The path forward was discussed at the September 2010 ANS-15 Subcommittee Meeting. The conclusion was to take a second look at the draft standard and engage fire protection engineers from national laboratories or universities who are familiar with the application of fire standards to laboratory and nuclear facilities. No member of the current working group is a fire protection engineer so a complete rewrite of the standard would not be valid without some level of fire protection expertise on the committee. One option discussed was to review requirements in fire protection standards such as NFPA 45 or 803 and determine how to apply these standards to a small research reactor based on risk and if backfitting is a requirement to bring older facilities into compliance. A new chair and members are being sought.

ANS-15.19, "Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor Facilities" (historical revision of ANSI/ANS-15.19-1991 – new standard)

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.

Membership:
Les Foyto, Chair, University of Missouri-Columbia Research Reactor (MURR); Kiratadas Kuttikad, University of Missouri-Columbia Research Reactor (MUIRR)

Status: Chair duties were transferred from Charles McKibben to Les Fotyo. Les Foyto, with assistance from Kiratadas Kuttikad, are working on a full rewrite. Additionally, there are two proposed rules currently out for comment that may affect the standard: (1) 10 CFR 70, "Requirements for Fingerprint-Based Criminal History Records Checks for Individuals Seeking Unescorted Access to Research or Test Reactors," and (2) 10 CFR 73, "Physical Protection of Irradiated Reactor Fuel in Transit." We are waiting on final rulemaking on these two proposed rules before finalizing the full rewrite draft.

ANS-15.20, "Criteria for the Reactor Control and Safety Systems of Research Reactors" (new standard)

Scope*:*
From 1988 PINS --This standard sets forth the criteria from which design and review requirements can be established for the reactor control and safety system of a research reactor.

Membership:
Thomas Myers, Chair, National Institute of Standards and Technology; Leo Bobek, University of Massachusetts—Lowell; Daniel Hughes, U.S. Nuclear Regulatory Commission; Anthony Norbedo, National Institute of Standards and Technology

Status: Additional working group members were added. The main focus of the working group is to define a scope. A PINS form will then be prepared for approval.

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, Chair, U.S. Nuclear Regulatory Commission; Stephen I. Miller, Armed Forces Radiobiology Research Institute; Steven R. Reese, Oregon State University; Clifford J. Stanley, Idaho National Laboratory

Status: Reaffirmation received ANSI approval 9/29/06. The draft was reviewed by ANS-15 and resulted in numerous comments requiring a significant rewrite. The revised draft was returned to ANS-15 for review. Comments from the second ANS-15 review are being incorporated into the standard.

Subcommittee ANS-19 – Physics of Reactor Design

Scope:

Identify needed standards relating to physics calculations for reactor core design, formulate such standards and specify their range of applicability. Such standards will (a) provide criteria for the selection of nuclear data and computational methods; (b) provide appropriate benchmark problem specifications for verification of calculational methods used by reactor core designers; (c) provide criteria for evaluation of accuracy and the range of applicability of data methods; (d) define methods of verification and of estimating uncertainties. Remain cognizant of and coordinate activities with other standards committees involved in more general development of nuclear standards, such as for units and terminology, reactor design criteria, and mathematics and computational methods.

Membership:

Dimitrios Cokinos, Chair, Brookhaven National Laboratory
Charles Rombough, Secretary, CTR Technical Services, Inc.
Steven Baker, Transware
William Bell, AIChE Representative (employed by South Carolina Electric & Gas Co.)
Michaele Brady Raap, Pacific Northwest National Laboratory
David Diamond, Brookhaven National Laboratory
Ian Gauld, Oak Ridge National Laboratory
Jun-ichi Katakura, Japan Atomic Energy Agency
Edward Knuckles, Florida Power and Light
Robert Little, Los Alamos National Laboratory
Russell Mosteller, Los Alamos National Laboratory
Benjamin Rouben, Atomic Energy of Canada, Limited
Enrico Sartori, Individual
Robert Schenter, Smart Bullets, Inc
Abraham Weitzberg, Individual

The following current standards and active projects are under the management of ANS-19.

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; Kirk Dickens, Retired from ORNL; Arnold Fero, Westinghouse Electric Company, LLC; Jun-ichi Katakura, Japan Atomic Energy Agency; Ed Knuckles, Florida Power and Light; Robert Schenter, Smart Bullets, Inc.; 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. A draft of the revision was reviewed and discussed at a working group meeting held at the November 2010 ANS Winter Meeting in Las Vegas. The revision includes new tables with decay heat values for actinides, an improved representation of the neutron capture correction factor for fission products, and a new and expanded representation of fission product uncertainties. Work to complete and approve the draft by the working group is continuing and a final draft should be ready for ANS-19 review in 2011.

ANSI/ANS-19.1-2002, "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; Richard McKnight, ANL; Russell Mosteller, LANL; Ben Rouben, AECL; Mike Zerkle, Bettis

Status: Revision received ANSI approval 7/23/2002. Progress continues to be made on the draft. The appendix and references still need work. The working group is considering reaffirmation of the 2002 standard to keep it a current American National Standard while the revision is being completed.

ANSI/ANS-19.3-2005, "Determination of Steady-State Neutron Reaction-Rate Distributions and Reactivity of Nuclear Power Reactors" (revision of ANSI/ANS-19.3-1983; R1989; R1995)

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, Los Alamos National Laboratory; 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: The current standard was approved 9/16/2005. This standard is being revised under a new title, "Steady-State Neutronics Methods for Power-Reactor Analysis." The working group has finalized the text, and the standard has gone through subcommittee balloting with no objections. Comments from balloting are being addressed. The draft should be ready for N17 ballot in early 2011.

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:
OPEN

Status: A reaffirmation received ANSI approval 10/31/2008. A working group chair and working group members are needed to initiate a revision of this standard.

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

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:
OPEN

Status: This standard was administratively withdrawn 5/3/2010. Working group members are being sought for a revision.

ANSI/ANS-19.6.1-2005 "Reload Startup Physics Tests for Pressurized Water Reactors" (revision of ANSI/ANS-19.6.1-1997)

Scope:
This standard applies to the reactor physics tests 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 and acceptable test methods to determine if the operating characteristics of the core are consistent with the design predictions, and to provide assurance that the core can be operated as designed. The 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.

This standard assumes that the same previously accepted analytical methods are used for both the design of the reactor core and the startup test predictions. It also assumes that the expected operation of the core will fall within the historical database established for the plant or sister plants. When major changes are made in the core design, the test program should be reviewed to determine if more extensive testing is needed. Typical changes that might fall in this category are the initial use of novel fuel cycle designs, significant changes in fuel enrichments, fuel assembly design changes, burnable absorber design changes, or cores resulting from unplanned short cycles, etc. Changes of this nature may lead to operation in regions outside of the plant's database and, therefore, it may be necessary to expand the test program.

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; Louis Grobmyer, Westinghouse Electric, LLC; Dan Kelley, FENOC; Moussa Mahgerefteh, Exelon Corporation; Danny Powers, Southern California Edison; 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 received ANSI approval 11/29/05. The revised draft was issued to N17 for ballot on 8/16/2010 and closed 10/16/2010 with minimal comments that were addressed. ANSI approval is expected in early 2011.

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

Scope:

From November 1989 Rough draft—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 data for these 12 fissioning systems are given as mass chain yields and their uncertainties and are presented in tabular form. Discussions are presented and references given concerning the application of the data. Concerns associated with the uncertainties in the mass chain yields are also discussed.

A set of cumulative fission yields and uncertainties are included explicitly for a number of special purpose fission-product nuclides, particularly those important to dosimetry.

Membership:
OPEN

Status: ANS-19.8 was redesignated ANS-5.2. No activity on this project in 2010. A working group chair and working group members are needed to initiate this project.

ANS-19.9, "Delayed Neutron Parameters for Light Water Reactors" (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; Anthony Attard, U.S. Nuclear Regulatory Commission; Robert Busch, University of New Mexico; William Charlton, Texas A & M University; Dimitrios Cokinos, Brookhaven National Laboratory; Don Harris, retired–Rensselaer Polytechnic; Ed Knuckles, Florida Power & Light Co.; David Loiaza, Los Alamos National Laboratory; Cecil Lubitz; Knolls Atomic Power Laboratory; Richard McKnight, Argonne National Laboratory; Peter Moller, Los Alamos National Laboratory; Robert Perry, retired–Los Alamos National Laboratory; Ben Rouben, retired–Atomic Energy of Canada - AECL CANDU; John Rowlands, retired - UKAEA; Yolanda Rugama, OECD/NEA; Alejandro Sonzogni, BNL; Greg Spriggs, Livermore National Lab; Bill Wilson, retired–Los Alamos National Laboratory

Status: Work continues on the draft.

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:
John Carew, Secretary, Brookhaven National Laboratory; James Adams, NIST; Stanwood Anderson, Westinghouse; Steven Baker, Transware Enterprises; Richard Cacciapouti, Duke Engineering; Alireza Haghighat, University of Florida; William Hopkins, Individual; 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. Lambros Lois retired as chair; no current activity in 2010.

ANSI/ANS-19.11-1997; R2002, "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:
Robert St. Clair, Chair, Duke Energy; Steven Baker, Transware Enterprises; Robert Borland, First Energy Nuclear Operating Company; James Brittingham, Palo Verde Nuclear Generating Station; Doug Brown, AREVA NP; Robert Hall, Dominion Energy; Michael Todosow, Brookhaven National Laboratory

Status: Reaffirmation received ANSI approval 12/17/2002. In 2008, the title of the next revision was changed to "Calculation and Measurement of the Moderator Temperature Coefficient of Reactivity for Pressurized Water Reactors," and the scope was revised slightly. A draft was completed, but reformatting in needed to convert the file from Word Perfect to Word.

ANS-19.12, "Nuclear Data for the Production of Radioisotope" (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:
Robert Schenter, Chair, Smart Bullets, Inc.; 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: Marc Garland stepped down as working group chair; Robert Schenter resumed as the working group chair of this project. Progress has been slow.

Table 1

N17 Research Reactors, Reactor Physics, Radiation Shielding and Computational Methods Organizational Chart					
ANS-1	**ANS-6**	**ANS-10**	**ANS-14**	**ANS-15**	**ANS-19**
Conduct of Critical Experiments	**Radiation Protection & Shielding**	**Mathematics & Computation**	**Fast Pulse Reactors**	**Operation of Research Reactors**	**Physics of Reactor Design**
Theodore Schmidt (Chair)	**William Hopkins (Chair)**	**Andrew Smetana (Chair)**	**Theodore Schmidt (Chair)**	**Sean O'Kelly (Chair)**	**Dimitrios Cokinos (Chair)**
1-2000 (R2007) Conduct of Critical Experiments	6.1.1 (W2001) Neutron and Gamma-Ray Fluence-To-Dose Factors	10.2-2000 (R2009) Portability of Scientific and Engineering Software	14.1-2004 (R2009) Operation of Fast Pulse Reactors	15.1-2007 (R2009) The Development of Technical Specifications for Research Reactors	5.1-2005 Decay Heat Power in Light Water Reactors
	6.1.2-1999 (R2009) Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants	10.3 (W2005) Documentation of Computer Software		15.2-1999 (R2009) Quality Control for Plate-Type Uranium-Aluminum Fuel Elements	19.3-2005 Determination of Steady State Neutron Reaction Rate Distributions and Reactivity of Nuclear Reactors
	6.3.1-1987 (R2007) Program for Testing Radiation Shields in Light Water Reactors (LWR)	10.4-2008 Verification and Validation of Non-Safety-Related Scientific and Engineering Computer Programs for the Nuclear Industry		15.4-2007 Selection and Training of Personnel for Research Reactors	19.3.4-2002 (R2008) The Determination of Thermal Energy Deposition Rates in Nuclear Reactors
	6.4-2006 Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants	10.5-2006 Accommodating User Needs in Scientific and Engineering Computer Software Development		15.8-1995 (R2005) Quality Assurance Program Requirements for Research Reactors	19.4 (W2010) A Guide for Acquisition and Documentation of Reference Power Reactor Physics Measurements for Nuclear Analysis Verification
	6.4.2-2006 Specification for Radiation Shielding Materials	10.7 (NEW) Non-Real Time, High Integrity Software for the Nuclear Industry		15.11-2009 Radiation Protection at Research Reactors	19.6.1-2005 Reload Startup Physics Tests for Pressurized Water Reactors
	6.4.3 (W2001) Gamma-Ray Attenuation Coefficients & Buildup Factors for Engineering Materials			15.16-2008 Emergency Planning for Research Reactors	19.8 (NEW) Fission Product Yields for 235U, 238U, and 239P
	6.6.1-1987 (R2007) Calculation and Measurement of Direct and Scattered Gamma Radiation from LWR Nuclear Power Plants			15.17 (W2010) Fire Protection Program Criteria for Research Reactors	19.9 (NEW) Delayed Neutron Parameters for Light Water Reactors
				15.19 (W2001) Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor	19.10-2009 Methods for Determining Neutron Fluence in BWR and PWR Pressure Vessel and Reactor Internals
				15.20 (NEW) Criteria for the Reactor Control and Safety Systems of Research Reactors	19.11-1997 (R2002) Calculation and Measurement of the Moderator Temperature Coefficient of Reactivity for Water Moderated Power Reactors
				15.21-1996 (R2006) Format and Content for Safety Analysis Reports for Research Reactors	19.12 (NEW) Nuclear Data for the Production of Radioisotope

NFSC
Nuclear Facilities Standards Committee

Carl A. Mazzola, Chair
Shaw Environmental & Infrastructure, Inc.

***Scope*:**

The NFSC is responsible for the preparation and maintenance of standards associated with nuclear facilities. The Committee's standards address siting, design, operation, and waste management activities at these facilities, as well as remediation and restoration of formerly utilized sites.
The ANS Standards Committee, through its Standards Board, coordinates all aspects of standards activities and interests within ANS and makes recommendations to the Society on matters involving standards.
The NFSC consists of the consensus committee (the "Committee"), eight subcommittees, and various working groups. The NFSC is responsible for establishing and managing the activities of the subcommittees and working groups needed to develop proposed standards within its scope of responsibility.

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:

ANS-21	*Maintenance, Operations, Testing & Training*
ANS-22	*Systems Design Criteria*
ANS-24	*Modeling & Analysis*
ANS-25	*Site Characteristics*
ANS-26	*Emergency Planning*
ANS-27	*Fuel Cycle, Waste Management & Decommissioning*
ANS-28	*HTGR Design Criteria*
ANS-29	*Advanced Initiatives*

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 NFSC standards and resolve review and ballot comments.

NFSC Membership:
Carl A. Mazzola, Chair, Shaw Environmental & Infrastructure, Inc.
R. Michael Ruby, Vice Chair, Constellation Energy
James K. August, CORE, Inc.
William H. Bell, South Carolina Electric & Gas Co.
Jeffery R. Brault, Shaw AREVA MOX Project
Charles K. Brown, Southern Nuclear Operating Company
Kevin R. Bryson, Shaw Environmental, Inc.
C.E. (Gene) Carpenter, U.S. Nuclear Regulatory Commission
Donald R. Eggett, Automated Engineering Services Corp.
Richard W. Englehart, Individual
Pranab Guha, U.S. Department of Energy
Peter S. Hastings, Duke Energy (NuStart Liaison)
Richard A. Hill, ERIN Engineering
N. Prasad Kadambi, Individual (Kadambi Engineering Consultants)
Evan M. Lloyd, Exitech Corporation

Sheila A. Lott, Los Alamos National Lab
Robert H. McFetridge, Westinghouse Electric Company, LLC
Timothy K. Meneely, Westinghouse Electric Company, LLC
Charles H. Moseley, Jr., ASME/NQA Liaison
Dennis G. Newton, AREVA NP
William B. Reuland, Individual
James C. Saldarini, Bechtel Power Corp.
Donald J. Spellman, Oak Ridge National Laboratory
Steven L. Stamm, Shaw Nuclear Services
John D. Stevenson, Individual (J.D. Stevenson & Associates)
J. Andrew Wehrenberg, Southern Nuclear Operating Company
Michael J. Wright, Entergy Operations, Inc.
Lawrence M. Zull, Defense Nuclear Facilities Safety Board

Liaisons
George Hutcherson, Institute of Nuclear Power Operations (INPO Liaison)
James H. Riley, Nuclear Energy Institute (NEI Liaison)

Member Alternates
Amy Hull, U.S. Nuclear Regulatory Commission (Alternate for Gene Carpenter)
Louis R. Grobmyer, Westinghouse Electric Company (Alternate for Robert McFetridge)
James O'Brien, U.S. Department of Energy (Alternate for Pranab Guha)
Ralph Surman, Westinghouse Electric Corporation, LLC (Alternate for Tim Meneely)
Allen T. Vieira, Bechtel Power Corporation (Alternate for James Saldarini)
John C. Butler, Nuclear Energy Institute (NEI Liaison for Jim Riley)

Observers
Robert H. Bryan, Jr., Individual
Eric P. Loewen, GE Hatichi Nuclear Energy
Jesse E. Love, Bechtel Power Corp.
C.D. (Tom) Thomas, Jr., Individual
Robert E. Scott, Individual

Report of NFSC

The NFSC met twice during 2010; June 14th, in San Diego, California, and November 8th, in Las Vegas, Nevada, in conjunction with the ANS annual and winter meetings. Richard Hall with Exelon resigned from the committee. The ANS-26 Subcommittee on Emergency Planning was reinstated with Evan Lloyd as chair and Charles Brown as Vice Chair. Several changes were made in subcommittee leadership this year. Gene Carpenter and Sheila Lott were appointed chair and vice chair (respectively) of the ANS-21 Subcommittee. Leadership on the ANS-27 Subcommittee reversed roles; Donald Eggett took over as chair with Jeffery Brault as vice chair.

The NFSC reaffirmed two standards and approved one new standard. Several additional standards were balloted and are resolving comments.

Approved in 2010:
ANSI/ANS-2.17-2010, "Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants" (new standard, supersedes ANS-2.17-1980; R1989)

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

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

Active standards/projects:
ANS-2.2, "Earthquake Instrumentation Criteria for Nuclear Power Plants" (revision of ANSI/ANS-2.2-2002)

ANS-2.3, "Standard for Estimating Tornado and Other Extreme Wind Characteristics at Nuclear Facility Sites" (historical revision of ANSI/ANS-2.3-1983 – new standard)

ANS-2.8, "Determining Design Basis Flooding at Power Reactor Sites" (historical revision of ANSI/ANS-2.8-1992 – new standard)

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

ANS-2.15, "Criteria for Modeling & Calculating Atmospheric Transport of Routine Releases from Nuclear Facilities" (new standard)

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

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

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

ANS-2.25, "Surveys of Terrestrial Ecology Needed to License Thermal Power Plants" (historical revision of ANSI/ANS- 1982; R1989 – new standard)

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

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

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

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

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

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

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

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 – new standard)

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 – new standard)

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)

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 – new standard)

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

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

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

ANS-40.21, "Siting and Operating Commercial Burial Grounds" (new standard)

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

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

ANS-51.10, "Auxiliary Feedwater System for Pressurized Water Reactors" (revision of ANSI/ANS-51.10-1991; R2002; R2008)

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

ANS-54.1, "General Safety Design Criteria for a Liquid Metal Reactor Nuclear Power Plant" (historical revision of ANSI/ANS-54.1-1989 – new standard)

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

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 – new standard)

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

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

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

Subcommittee ANS-21 – Maintenance, Operations Testing & Training

***Membership*:**
Gene Carpenter, Chair, U.S. Nuclear Regulatory Commission
Sheila Lott, Vice Chair, Los Alamos National Laboratory
Donald Eggett, Automated Engineering Services Corp.
James Glover, Graftel, Inc
Robert Kassawara, Electric Power Research Institute
John Dennis Koutouzis, Institute for Nuclear Power Operations
Evan M. Lloyd, Exitech Corporation
Carl Mazzola, Shaw Environmental & Infrastructure, Inc.
Patricia Milligan, U.S. Nuclear Regulatory Commission
Charles H. Moseley, Individual
Matthew Parker, Savannah River Nuclear Solutions, LLC
Jack W. Roe, Nuclear Energy Institute
William J. Rudolph II, First Energy, Corporation
Julie Sickle, Constellation Energy Nuclear Group
Marion Smith, STP Nuclear Operating Company
Barbara Stevens, Exelon Corp.

ANS-21 manages the following active projects and current standards:

ANSI/ANS-2.10-2003, "Criteria for the Handling and Initial Evaluation of Records from Nuclear Power Plant Seismic Instrumentation" (revision of ANSI/ANS-2.10-1979)

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 ANS-2.23-2002.

Membership:
OPEN

Status: Received ANSI approval 4/14/2003. Due to an inability to find a working group chair and members to support this standard, the NFSC is researching the use of this standard and whether it should be allowed to be administratively withdrawn for lack of maintenance.

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.

ANS-3.1, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants" (revision of ANSI/ANS-3.1-1993; R1999 – 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.; Hamer Carter, Progress Energy; Kent Hamlin, INPO; Paul Harlos, Southern Nuclear Operating Co.; Jerry Hiatt, Bartlett Inc.; Al Lindsay, Duke Engery; Gregg Ludlam, Exelon; Paul McNulty, First Energy; Rick Pelton, NRC; Jay Phelps, STP; Chuck Sizemore, FPL; Greg Sparks, Entergy

Status: With the loss of ANS-3.1 Working Group Chair Russell Smith, the working group regrouped. Julie Sickle assumed the chair position in late 2010.

ANSI/ANS-3.2-2006, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants" (revision of ANSI/ANS-3.2-1994; R1999)

Scope:
This standard provides requirements and recommendations for administrative controls and the owners' quality assurance program to help ensure that activities associated with nuclear power plant operation are carried out without undue risk to the health and safety of the public. This standard provides requirements for implementing quality assurance programs consistent with requirements of Code of Federal Regulations, Title 10, Part 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. Applicable sections of this standard can 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; John Adkins, Individual; 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; William J. Rudolph II, First Energy Nuclear Operating Company; Stanley Stasek, Detroit Edison Company; Richard Sweigart, Duke Energy; Donato Visco, Arizona Public Service Co.; Thomas White, Entergy Nuclear; Dennis Winchester, Exelon

Status: The current standard received ANSI approval 7/31/2006. During 2010 the working group addressed the need to revise ANS-3.2. Marion Smith was elected as chair and Clint Eldridge moved to vice-chair. The working group was reconstituted and the new membership represents over 70 operating nuclear plants. The working group is undertaking the revision to develop a standard that is in concert with NQA-1a-2009 and focuses on managerial and administrative requirements that are specific to the operational phase of nuclear power plants. A PINS form was prepared and is in the approval process. The group developed a draft of the revised standard and the revised standard is in the internal review process.

ANSI/ANS-3.4-1996; R2002, "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants" (revision of ANSI/ANS-3.4-1983; R1988)

Scope:
This standard defines the medical and psychological requirements for licensing of nuclear power plant reactor operators and senior operators. It also addresses the content, extent, and methods of examination.

Membership:
Barb Stevens, Chair, Exelon Corp.; Sam Hansell, NRC; Thomas Jetzer, Individual; Laurie Kubec-Krause, Nexter Energery; Hironori Peterson, NRC; Julianne Peterson, Xcel Nuclear; William Pilkey, Exelon Corp.; Carole Revelle, NRC; George Rombold, Scientech; Jennifer Shaver, Southern California Edison

Status: Reaffirmation received ANSI approval 7/23/2002. The ANS-3.4 Working Group held two meetings and additionally had three teleconferences per month. Excellent progress is being made. The draft is approximately 75% completed. It is anticipated that the draft will be ready to start the approval process before the end of 2011.

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; Robert Goldman, Entergy; David Goodman, TXU Energy; J. Dennis Koutouzis, 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 Sales, North Anna Power Station; Frank A. Tarselli, Individual

Status: The current standard received ANSI approval on 9/4/2009. The working group met in San Diego at the annual Society for Simulation's Conference for Power Plant Simulation in February 2010 to discuss significant changes in the ANS-3.5-2009 standard as compared to the ANS-3.5-1998

standard with the nuclear power plant simulation industry. The working group met again at the Oconee Nuclear Station in July 2010 to generate public comments regarding Draft Regulatory Guide 1248; this document is greatly anticipated by our customers as we expect the Nuclear Regulatory Commission to endorse the ANSI/ANS-3.5-2009 standard for use in the nuclear power plant industry. In October 2010 the ANS-3.5 Working Group met at the American Nuclear Society (ANS) facility in La Grange Park, Illinois, to re-organize and select new membership. Nine "legacy" members carry forward from the ANSI/ANS-3.5-2009 standard effort. The ANS received 11 new applications for membership; seven were accepted. The next working group meeting is scheduled for January 2011 at the Crystal River Nuclear Power Plant Training Center in Crystal River, Florida. Topics at this meeting will include finalizing a scope and initiating a PINS for revision to ANSI/ANS-3.5-2009.

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:
Matthew Parker, Chair, Savannah River National Laboratory; Mark Abrams, ABS Consulting Inc.; Robert Banta, NOAA/ERL R/E/ET2; Ron Baskett, Lawrence Livermore National Laboratory; Robert Baxter, T & B Systems, Inc.; Tom Bellinger, B&W Y12; Patrick T. Brennan, Meteorological Evaluation Services Co. Inc.; Jennifer Call, Tennessee Valley Authority; Mark Carroll, Murray & Trettel, Inc; Kirk Clawson, NOAA Air Resources Laboratory FRD; Rachel Coquilla, Otech Engineering, Inc.; Jerry Cresenti, Iderdrola Renewables; Jim Fairobent, US Department of Energy; Paul Fransioli, Kleinfelder; Clifford S. Glantz, Pacific Northwest National Laboratory; R. Brad Harvey, USNRC; Jim Holian, Science Applications International Corp.; Chuck Hunter, SRNL; John Irwin, John Irwin & Assoc.; David Katz, Climatronics; Stanley Krivo, EPA; Stanton Lanham, Duke Energy Corp.; Carl Mazzola, Shaw; Doyle Pittman, Tennessee Valley Authority; Ed McCarthy, Pacific Gas & Electric Co.; Kevin Quinlan, USNRC; Walter Schalk, NOAA-Air Resources Laboratory-SORD; Steven Vigeant, Shaw Environmental & Infrastructure; Ping Wan, Bechtel Corportion, Kenneth Wastrack, Tennessee Valley Authority

Status: ANSI approved a reaffirmation of this standard on 12/23/2010. The working group will hold a meeting to discuss future revisions of the standard during the 14th Meeting of the Nuclear Utility Meteorological Data Users Group (NUMUG) planned for June 2011 in the Chicago, Illinois, vicinity. Stanton Lanham was added to the working group.

ANSI/ANS-56.8-2002, "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:
Jim Glover, Chair, Graftel Inc.; Jerome Bettle, NRC; Wendell Brown, Duke Energy Company; Ken Clark, Individual; Kelvin Green, Tennessee Valley Authority; Howard Hill, Individual; Gary Holtz, PGE,

Diablo Canyon; Murray Jennex, University of Arizona; Steven Leighty, Westinghouse; Dan Oakley, Exelon Corporation; Babul Patel, Consultant; Robert Shirk, ILRT, Inc.

Status: The current standard received ANSI approval 11/27/2002. Although progress is slower than anticipated, the working group remains active and working on producing a revision to the standard. We are projecting a December 2011 date for submittal of the latest revision to ANS for the start of the review/approval process.

ANSI/ANS-58.6-1996; R2001, "Criteria for Remote Shutdown for Light Water Reactors" (revision of ANSI/ANS-58.6-1983; R1989)

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
OPEN

Status: Received ANSI approval 8/31/2001. New working group chair/members needed to maintain this standard before it is administratively withdrawn.

Subcommittee ANS-22 – System Design Criteria

Membership:
Dennis Newton, Chair, AREVA
Mike Ruby, Vice Chair, Constellation Energy
Neil Brown, Lawrence Livermore national Laboratory
Pranab Guha, U.S. Department of Energy
Earnestine Johnson, Bechtel Corp.
Leroy (Rocky) Kreider, Engineering Planning & Management, Inc.
Mark Linn, Oak Ridge National Laboratory
Patrick Salkeld, Westinghouse

ANS-22 manages the following active projects and current standards:

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

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

ANSI/ANS-51.10-1991; R2002; R2008, "Auxiliary Feedwater System for Pressurized Water Reactors" (revision of ANSI/ANS-51.10-1979)

Scope:
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, Chair, Bechtel Corporation; Rick Hill, Erin Engineering; Stanley Gardocki, NRC; Joseph McCumber, AREVA; Tasnima Matin, MPR Associates; David Murphy, Bechtel Power;

Status: Reaffirmation approved by ANSI 10/14/2008. The reaffirmation was achieved with the provision that a revision would be initiated to address several comments. A PINS for a revision was approved and submitted to ANSI in April of 2009. The group welcomed new member, Tasnima Matin, who joined with I&C experience. The working group has been actively working on the revision periodically during the year. It was discussed that the standard will continue to reflect new plant design and that its applicability would have to be limited to those designs docketed with the NRC during the time of this revision work.

ANSI/ANS-55.1-1992; R2000; 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 processing 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:
OPEN, Chair; Edgar Degiovanni, Southern California Edison; Clint Miller, Pacific Gas & Electric; Craig Schmiesing, AREVA; Dick Snell, Snell Consulting; David Vaught, Duke Power; Michael Walsh, Jacobs Engineering; Chang-Yang Li, U.S. NRC

Status: Reaffirmation received ANSI approval 6/15/09. A revision is planned. Several working group members were sought; however, a working group chair is needed to initiate the revision.

ANSI/ANS-55.4-1993; R1999; R2007, "Gaseous Radioactive Waste Processing Systems for Light Water 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:
OPEN, Chair; Edgar Degiovanni, Southern California Edison; Clint Miller, Pacific Gas & Electric; Craig Schmiesing, AREVA; Dick Snell, Snell Consulting; David Vaught, Duke Power; Michael Walsh, Jacobs Engineering; Chang-Yang Li, U.S. NRC

Status: Reaffirmation approved by ANSI 5/14/07. A revision is planned. Several working group members were sought; however, a working group chair is needed to initiate the revision.

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

Status: Reaffirmation approved by ANSI 5/14/07. A revision is planned. Several working group members were sought; however, a working group chair is needed to initiate the revision.

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 2010.

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; Rick Hill, ERIN Engineering; Göran Hultqvist, Forsmark-Vattenfall; Huafei Liao, Bechtel; Julius Persenky, Idaho National Laboratory

Status: Reaffirmation received ANSI approval 8/25/08. A revision of the standard is in development.. Patrick Salkeld replaced Rick Hill as working group chair. A revised PINS was prepared and was in the approval process for resubmittal to ANSI. The working group is actively engaged in defining what needs to be revised.

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 2010.

ANSI/ANS-58.11-1995; R2002, "Design Criteria for Safe Shutdown Following Selected Design Basis Events in Light Water Reactors" (revision of ANSI/ANS-58.11-1983; R1989)

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: Reaffirmation received ANSI approval 7/23/2002. Project looking for working group chair/members.

ANSI/ANS-58.14, "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: The draft of ANS-58.14 is out for final ballot with the NFSC. Following public review and resolution of all comments, it is anticipated that ANS-58.14 will be published in mid 2011.

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

Scope:

This standard provides guidance for the safety classification of items [structures, systems, components (SSCs)and administrative controls associated with nuclear safety in non-reactor 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 design and operational requirements to satisfy these functions. It also associates the safety classification 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 SSCs. Pressure integrity classification criteria are provided for assignment of Safety Design Classes, SDC 1,2,3,4 or 5 to the nuclear safety related and pressure retaining portions of items and to include associated load criteria. Also provides allowable behavior criteria to identify Limit States A, B, C, and D that is currently defined in ANS standards for seismic loads.

Membership:

Pranab Guha, DOE; Randy Bunt, Southern Nuclear; Chris Chaves, DOE; David Cook, ORNL; Gerald Couture, Westinghouse Electric; Dennis R. Damon, NRC; Mosi Dayani, SRS MOX; Robert Eble, SRS MOX; Richard Englehart, Individual; Gregory Jones, ORP; James Kuropatwinski, LANL; Mark Linn, ORNL; Pete Lowry, PNNL; Carl Mazzola, Shaw Group; Pradyot K. Niyogi, DOE; Mark Ramsay, DOE/ORP; Louis Restrepo, Omicron; Rafael Rodriguez, NRC; Subir Sen, DOE; John Stevenson, Individual

Status: A working group was formed and a revised PINS, modifying the scope and title of the proposed standard, was submitted to the NFSC for approval. While waiting for the PINS approval, the working group is actively engaged in developing the standard. The working group conducts monthly conference call meetings and conducted three face-to-face meetings. By the first quarter of 2011, the working group expects to complete the draft standard and circulate it among limited stakeholders for constructive comments and feedback on its usability.

ANSI/ANS-59.3-1992; R2002, "Nuclear Safety Criteria for Control Air Systems" (revision of ANSI/ANS-59.3-1984)

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: Reaffirmation received ANSI approval 8/30/2002. Rick Hill retired as working group chair of this project in 2010.

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 2010.

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 2010.

Subcommittee ANS-24 – Modeling & Analysis

Membership:
Andrew Wehrenberg, Chair, Southern Nuclear Operating Company
Carl Beyer, Pacific NW National Laboratory
John Ciolek, AlphaTRAC, Inc.
James Gilmer, U.S. Nuclear Regulatory Commission
Cliff Glantz, Pacific Northwest National Laboratory
Doyle Pitmann, Tennessee Valley Authority
Thomas Rucker, SAIC
Jean Savy, Individual
Saleem Salayameh, Westinghouse Savannah River Company
Jim Sejvar, Individual

The following current standards and active projects are under the management of ANS-24:

ANS-2.15, "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, PNNL; Mark Abrams, ABS Consulting, Inc.; Tom Bellinger, ORNL; David Brown, U.S. Nuclear Regulatory Commission; Mark Carroll, Murray & Trettel, Inc. Weather Command; Jim Fairobent, NNSA/NA-41; Brad Harvey, U.S. NRC; Chuck Hunter, SRNL; Alex Kasprak, MA Highway; Marsha Kinley, Duke Energy; Y.J. Lin, Bechtel Power Corp.; Mike Mazaika, U.S. Nuclear Regulatory Commission; Carl Mazzola, Shaw Environmental; Ed McCarthy, PG&E; John Nasstrom, LLNL NARAC; Kevin O'Kula, WSMS; Matt Parker, SRNL; Doyle Pittman, TVA; Jeremy Rishel, PNNL; Ali Simpkins, Dade Moeller & Assoc.; Steve Vigeant, Shaw Environmental; Ping Wan, Bechtel; Ken Wastrack, TVA; Judi Williams, Arizona Public Service

Status: NFSC approved the PINS in 2004. The full working group met via five teleconferences during 2010. The group requested and received a slight modification to the standard title which substitutes "dispersion" for "transport" and which adds "radiological" to better differentiate the types of routine releases considered. A sub-working group met to investigate the influence of complex flow features, such as recirculation. The sub-working group determined that complex flow features can influence routine release modeling results. The full working group developed a methodology that requires use of complex modeling systems if the estimated dose levels approach regulatory limits and the modeling domain experiences complex flow during the year. The working group completed all major modifications and is finalizing the standard document for external review.

ANS-2.16, "Criteria for Modeling Design-Basis Accidental 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 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; Cliff Glantz; Co-Chair, PNNL; Mark Abrams, ABS Consulting, Inc.; Tom Bellinger, ORNL; Roger Brode, EPA; Mark Carroll, Murray & Trettel, Inc. Weather Command; Jim Fairobent, NNSA/NA-41; Brad Harvey, U.S. NRC; Chuck Hunter; SRNL; Alex Kasprak, MA Highway; Marsha Kinley, Duke Energy; Joe Laznow, JL & Assoc.; Y.J. Lin, Bechtel Power Corp.; Carl Mazzola, Shaw Environmental; Ed McCarthy, PG&E; John Nasstrom, LLNL NARAC; Kevin O'Kula, WSMS; Matt Parker, SRNL; Doyle Pittman, TVA; Jeremy Rishel, PNNL; Ali Simpkins, Dade Moeller & Assoc.; Steve Vigeant, Shaw Environmental; Ping Wan, Bechtel; Ken Wastrack, TVA; Judi Williams, Arizona Public Service

Status: NFSC approved the PINS in 2004. Work on the draft will begin when ANS-2.15 has reached the review phase. ANS-2.15 will be used as a template for ANS-2.16.

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, Lawrence Livermore National Laboratory; 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 2010.

ANS-3.8.10, "Criteria for Modeling Real-time Accidental Release Consequences at Nuclear Facilities" (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, PNNL; Mark Abrams, ABS Consulting, Inc.; Tom Bellinger, ORNL; Roger Brode, EPA; Mark Carroll, Murray & Trettel, Inc. Weather Command; Jim Fairobent, NNSA/NA-41; Brad Harvey, U.S. NRC; Chuck Hunter; SRNL; Alex Kasprak, MA Highway; Marsha Kinley, Duke Energy; Joe Laznow, JL & Assoc.; Y.J. Lin, Bechtel Power Corp.; Carl Mazzola, Shaw Environmental; Ed McCarthy, PG&E; John Nasstrom, LLNL NARAC; Kevin O'Kula, WSMS; Matt Parker, SRNL; Doyle Pittman, TVA; Jeremy Rishel, PNNL; Ali Simpkins, Dade Moeller & Assoc.; Steve Vigeant, Shaw Environmental; Ping Wan, Bechtel; Ken Wastrack, TVA; Judi Williams, Arizona Public Service

Status: Work will begin on a draft of ANS-3.8.10 once ANS-2.15 and ANS-2.16 are in the review phase.

ANS-5.4, "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; Daniel Baron, EDF - France; Michelle Billaux, AREVA; Paul Cantonwine, GNF; Paul Clifford, U.S. NRC; Nayem Jahingir, GNF; Erik Kolstad, Institutt for Energiteknikk; Brent Lewis, Royal Military College of Canada; Yun Long, Westinghouse; Robert Montgomery, Anatech; Chuck Patterson, GNF; Tony Turnbull, Individual; John Voglewede, U.S. NRC; Bob Weiner, K W Consulting

Status: With subcommittee approval, the draft was issued for formal ballot to the NFSC in April of 2010. Comments from NFSC members were resolved and incorporated into the draft as necessary. A few of the changes were considered substantive requiring a reballot for approval. The reballot is due in January 2011. ANSI approval is anticipated in early 2011.

ANSI/ANS-5.10-1998; R2006, "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; additional members being sought

Status: Reaffirmation approved by ANSI 11/6/06. The old members of the working group were contacted for the participation in the revision of this standard and most have agreed to participate. Additional participation is actively being sought from fuel manufacturing facilities (e.g. enrichment and fabrication), uranium recovery facilities (e.g. mines), waste disposal facilities, spent fuel facilities, NRC and international members. Working group members should be finalized early next year to start the revision process.

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:
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. Roger Spence retired as chair for this project. A new chair will need to be sought.

ANS-18.1, "Radioactive Source Term for Normal Operation for Light Water Reactors" (historical revision of ANSI/ANS-18.1-1999 – 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:
James Sejvar, Chair, Individual; Dennis Hussey, Co-Chair, Electric Power Research Institute; Justin Byard, AREVA NP, Inc.; Olga A. Correal-Pulver, Westinghouse Electric Company Nuclear Fuels; Germina Ilas, Oak Ridge National Laboratory; Jay Y. Lee, USNRC; Erik Kirstein, GE Energy; Mark Rutherford, AREVA NP; Pavel V. Tsvetkov, Texas A&M University

Status: Activity measurements from operating plants to provide the basis for data updates are needed to proceed with the revision of this standard. Several sources have been contacted for the needed data. So far there has been no success.

ANS-41.5, "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: A teleconference was held April 27, 2010, and a resolution found. The working group has a path forward and needs to make a couple last changes to the draft. A few of the changes made have been deemed substantive and will require a third ballot and public review anticipated in 2011.

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:

James M. Gilmer, Chair, Bechtel; Christopher Brennan, Exelon; John Gray, Sargent & Lundy; Bruce Hardy, Savannah River; Phil Kotwicki, Westinghouse; Mohamoud Massoud, Constellation; Wallace McAfee, ORNL; Har Mehta, GENE; Andy Wehrenberg, Southern Company

Status: There was no activity to report in 2010.

Subcommittee ANS-25 – Site Characteristics

Membership:

Kevin Bryson, Chair, Shaw Environmental & Infrastructure
Carl Mazzola, Vice Chair, Shaw Environmental & Infrastructure, Inc.
James Bollinger, Savannah River National Laboratory
Carl Costantino, Individual
William Dornsife, Waste Control Specialists
Angelos Findikakis, Bechtel Corp.
Clifford Glantz, Pacific Northwest National Laboratory
Chris Guggino, Bechtel Corp.
Kathyrn Hanson, AMEC-Geomatrix Consultants
Joe Litehiser, Bechtel Corporation
Ron Markovich, Contingency Management Consulting Group LLC
Farhang Ostadan, Bechtel Corp.
Todd Rasmussen, University of Georgia
John Stevenson, Individual (J.D. Stevenson & Associates)
Lance Vail, Pacific Northwest National Laboratory
Steve Vigeant, Shaw Environmental & Infrastructure, Inc.

The ANS-25 Subcommittee manages the following active projects and current standards:

ANSI/ANS-2.2-2002, "Earthquake Instrumentation Criteria for Nuclear Power Plants" (revision of ANSI/ANS-2.2-1988)

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. NRC; Aejaz Ali, AREVA NP; Vladimir Graizer, U.S. NRC; 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

Status: Work on the revision was slowed to wait for the status of Regulatory Guide 1.12 to maintain consistency between the two documents.

ANS-2.3, "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 (J.D. Stevenson & Associates); Mo Amin, Sargent & Lundy Engineers; Art Buslick, U.S. NRC; Antonio Godoy, IAEA; Brad Harvey, U.S. NRC; Quazi A. Hossein, LLNL; Jeff Kimball, NNSA; Carl A. Mazzola, Shaw Environmental & Infrastructure, Inc.; James R. McDonald, Individual; Sujit K. Samaddar, U.S. NRC; Emil Simiu, NIST

Status: In October of 2010, the draft was issued to the NFSC for committee ballot with a concurrent public review. Comments are being addressed. It is anticipated that this standard will gain ANSI approval in early to mid 2011.

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

Scope:
This standard is designed to provide the applicant with procedures which are generally acceptable in the professional demographics community for estimating present and forecasting future population distributions in the vicinity of a site proposed for a nuclear power plant. This standard will be extended to be applicable to all nuclear facilities and will also address environmental justice considerations.

Membership:
OPEN

Status: This project is on hold due to the lack of industry support.

ANS-2.8, "Determining Design Basis Flooding at Power Reactor Sites" (historical revision of ANSI/ANS-2.8-1992 – 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:

Chair position OPEN; Jim August, CORE, Inc.; Catalino Cecilio, Catalino B. Cecilio Consulting; Kuo-Fu Chen, Washington Savannah River Company; John D. Stevenson, Individual (J.D. Stevenson & Associates) ; Bill Stillwell, South Texas Project Nuclear Operating, Co.; Kit Yin Ng, Bechtel Power Corp.; Ron Noble, Noble Consultants (potential member)

Status: The project is currently on hold until a new chair is identified.

ANS-2.9, "Evaluation of Ground Water Supply for Nuclear Facilities" (historical revision of ANSI/ANS-2.9-1980; R1989 – 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; 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: With the approval of ANSI/ANS-2.17-2010, "Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants," just before the end of 2010, the working group will focus on initiating the revision to ANSI/ANS-2.9-1980; R1989 in 2011.

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

Old Scope:

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:

Lance Vail, Pacific Northwest National Laboratory
Balance of membership OPEN

Status: No activity in 2010.

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.

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

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
Balance of working group OPEN

Status: The intent is to initiate this project beginning with the development of a PINS. Additional membership being sought.

ANS-2.21, "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. NRC; Brad Harvey, U.S. NRC; Stan Gardocki, U.S. NRC; Robert Kannor, Bechtel Power; Al Garrett, SRNL; Matt Parker, SRNL

Status: The draft of the standard was distributed to the Nuclear Facilities Standards Committee (NFSC), which is the formal consensus committee review in parallel to public review in early 2010. The results of the NFSC vote on the standard were received in May 2010 with some negative votes and supplemental comments to improve the standard. Additional supplemental comments were received in June 2010 from one of the reviewers. These supplemental comments were fairly substantial and are in the process of being incorporated into the standard with the goal of re-submitting the standard to ANS in January 2011.

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

Chris Guggino, Chair, Bechtel Power Corporation; Gary Jacob, Shaw Group
Balance of Membership: OPEN

Status: With project approval, working group members are being solicited.

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: No activity in 2010.

ANS-2.30, "*Assessing Capability for Surface Faulting at Nuclear Facilities*" (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:

James E. Beavers, Co-Chair, Individual; Ivan Wong, Co-Chair, URS Corporation; Bill Bryant, California Geological Survey; Rui Chen, California Geological Survey; Keith Kelson, Furgo WLA; Jeffrey K. Kimball, U.S. Department of Energy; Joe Litehiser, Bechtel; Susan Olig, URS Corporation; David Schwartz, U.S. Geological Survey; Donald Wells, AMEC Geomatrix; Alice Stieve, U.S. Nuclear Regulatory Commission

Status: The first two meetings of the reformed ANS-2.30 Working Group were held on October 14 and November 23, 2010, in Oakland, California. The meetings were devoted to discussing the purpose and content of the standard, its relationship to the other seismic hazard standards, and the issues associated with defining and assessing the hazard from tectonic surface fault rupture and deformation. A major issue is the definition of siting criteria and to what extent can general seismic design recommendations be made. A probabilistic approach to surface fault rupture was agreed upon as the principal tool for hazard assessment. An outline of the standard was developed in the second meeting, writing assignments made, and a draft standard is being prepared.

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

Unapproved Scope:

The scope of this standard address extreme natural site hazards associated with extreme precipitation (rain, snow, ice and their combination) while is applicable to important to nuclear safety structures with probabilities of exceedence or return periods consistent with extreme design basis wind and earthquake loads.

Membership:

John D. Stevenson, Chair, Individual (J. D. Stevenson & Associates)
Balance of Membership: OPEN

Status: A Project Initiation Notification System (PINS) form was prepared and issued to the NFSC for review and approval. Comments from the NFSC review are being considered. The working group will be formed once the PINS is approved.

ANS-40.21, "Siting, Construction, and Operation of Commercial Low Level Radioactive Waste Burial Grounds" (new standard)

Unapproved Scope

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.

Membership:
William Dornsife, Chair, Waste Control Specialists; Michael D. Kaminski, ANL; Roger Seitz, SRNL; Leah Spradley, NRC

Status: The working group has reviewed the comments that have been provided on the task. It looks like the consensus is that this standard should not address all three of the issues (siting, construction and operations) in one standard. Siting, in particular, is a state specific issue with some additional requirement in 10 CFR Part 61. We are looking to get some additional members that have experience in these issues and begin drafting the standard.

Subcommittee ANS-26 – Emergency Planning

Membership:
Evan Lloyd, Chair, Exitech Corporation
Charles Brown, Vice Chair, Southern Nuclear Operating Company
Ronald Markovich, Contingency Management Consulting Group LLC

ANS-3.8.1, "Properties of Radiological Emergency Response Functions and Organizations for Nuclear Facilities" (historical revision of ANSI/ANS-3.8.1-1995 – 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, DOE; Steve Hook, Individual; Maureen Zawalick, PGE; 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.

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 – 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, DOE; Kevin Keyes, Department of Homeland Security; Steve Hook, Individual; Maureen Zawalick, PGE.

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.

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 – new 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, DOE; Richard J. Stuhler, DOE; Kevin Keyes, Department of Homeland Security; Steve Hook, Individual, Maureen Zawalick, PGE

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.

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 – 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, DOE; 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.

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 – 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; William Hawkins, DOE; Stephen Luckett, DOE; Steve Hook, Individual; William Renz, Entergy Nuclear; Maureen Zawalick, PGE; Kevin Keyes, Department of Homeland Security; Steven Erickson, Contingency Management Consulting Group, LLC; Martin Hug, NEI; Scott McCain, EP Tec, Inc; Randy Sullivan, NRC; Donald Tailleart, NRC

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. The working group held a one-day meeting at the ANS offices in La Grange Park, IL. Section assignments were made. A rough draft was expected to be completed for a preliminary review in early 2011. It is expected that it will take 2 years to develop the Drill and Exercise standard. The standard would also service DOE.

Subcommittee ANS-27 – Fuel Cycle, Waste Management & Decommissioning

Membership:
Donald Eggett, Chair, Automated Engineering Services Corp.
Jeffery Brault, Vice Chair, AREVA Shaw MOX Project
Dennis Ferrigno, CAF & Associates, LLC
Mark Gerboth, Energy Solutions
Clint Miller, Pacific Gas & Electric Company

ANS-27 manages the following active projects and current standards:

ANS-40.35, "Volume Reduction of Low-Level Radioactive Waste or Mixed Waste" (historical revision of ANSI/ANS-40.35-1991– 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:
Dennis Ferrigno, Co-Chair, CAF & Associates, LLC
Mark Gerboth, Co-Chair, Energy Solutions

Status: We have been working on recruiting some additional members, and have extended two invites. We plan on meeting at the Waste Management conference in Phoenix during the last week of February 2011 to address membership as well as scope the effort to be accomplished in 2011.

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 2010.

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 2010.

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

Scope:
Proposed scope: This standard presents necessary design requirements for facilities at nuclear power plants for the pool storage and preparation for shipment of spent fuel from light-water moderated and cooled nuclear power stations, including consideration of the impact of high burn-up fuels. It contains requirements for the design of the following: (1) Fuel storage pool (2) Fuel storage racks (3) Pool makeup, instrumentation and cleanup systems (4) Pool structure and integrity (5)

Radiation shielding (6) Residual heat removal (7) Ventilation, filtration and radiation monitoring systems (8) Shipping cask handling and decontamination (9) Building structure and integrity (10) Fire protection and communication Design requirements for spent fuel storage in an Independent Spent Fuel Storage Installation (ISFSI) subsequent to such initial pool storage are covered in ANSI/ANS Standard 57.7.

Membership:
OPEN

Status: The project is on hold. No activity in 2010.

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

Scope:
Proposed Scope: This standard defines the required functions of wet or dry storage facilities for new fuel, including high burn-up fuel, at light water reactor nuclear power plants. It provides minimum design requirements for safe 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 storing fuel containing new and recycled uranium and mixed oxides. The basis of this standard is that the intended function of the facilities 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.

Membership:
OPEN

Status: The project is on hold. No activity in 2010.

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.

Membership:
OPEN

Status: Received ANSI approval 2/28/2006. No current activity.

ANSI/ANS-57.8-1995; R2005, "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.

Membership:
OPEN

Status: Reaffirmation approved 1/12/2005. No activity in 2010.

ANS-57.9, "Design Criteria for an Independent Spent Fuel Storage Installation (Dry Type)" (historical revision of ANSI/ANS-57.9-1992; R2000)

Scope:
This standard is intended to be used by the owner and operator of a dry storage-type independent spent fuel storage installation (ISFSI) in specifying the design requirements and by the designer in meeting the minimum requirements of such installations. The standard includes requirements for the following: the design of major buildings and structures, shipping cask unloading and handling facilities, cask decontamination, loading and unloading areas, spent fuel storage areas and racks, fuel handling equipment, radiation shielding, special equipment and area layout configurations, air or gas quality, storage area integrity, air or gas cleanup, fuel inspection, ventilation, residual heat removal, radiation monitoring, prevention of criticality, radwaste control and monitoring systems, provisions to facilitate decommissioning, quality assurance, materials accountability, and physical security. This standard continues the set of American National Standards on spent fuel storage. Similar standards are: (1) Design Requirements for Light Water Reactor Spent Fuel Storage Facilities at Nuclear Power Plants, ANSI/ANS-57.2-1983. (2) Design Criteria for an Independent Spent Fuel Storage Installation (Water Pool Type), ANSI/ANS-57.7-1988. (3) Guidelines for Establishing Site-Related Parameters for Site Selection and Design of an independent Spent Fuel Storage Installation (Water Pool Type), ANSI/ANS-2.19-1988(R1990); and (4) Design Criteria for Consolidation of LWR Spent Fuel, ANSI/ANS-57.10-1987.

Membership:
OPEN

Status: A last minute reaffirmation ballot was issued in April of 2010, but there was no time to resolve committee comments. This standard was administrative withdrawn by the American National Standards Institute for lack of maintenance on June 7, 2010. The need to initiate a revision of this standard will need to be determined.

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.

Membership:
OPEN

Status: Received ANSI approval 7/6/2006. No current activity.

Subcommittee ANS-28 – HTGR Design Criteria

Membership:
James August, Chair, Core Inc.
Robert Bratton, Secretary, Idaho National Laboratory
John Bolin, GATech
Karl Fleming, Tech Insights (PBMR)
John Gaertner, Electric Power Research Institute
Malcolm LaBar, Individual
Lewis Lommers, AREVA
Pete Lowry, Pacific Northwest National Laboratory
Phillip Mills, Idaho National Laboratory
Stuart Rubin, U.S. NRC
Farshid Shahrokhi, AREVA
Don Spellman, Oak Ridge National Laboratory
Edward Wallace, PBMR Pty.

The following active project is under the management of ANS-28:

ANS-53.1, "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, Univ. of Illinois; Lewis Lommers, AREVA; Pete Lowry, PNL; Stuart Rubin, U.S. NRC; Farshid Shahrokhi, AREVA; Don Spellman, ORNL; Edward Wallace, PBMR Pty.

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

Status: The 2009 ballot of the draft resulted in significant comment. As a result of that ballot, we responded to questions and initiated efforts to resolve outstanding concerns. Two primary concerns were the interface with separate PRA standards, and the consolidation and simplification of Section 8.0 on Special Treatments. We negotiated improved wording for the PRA guidance with members of the ANS Risk Informed Standards Committee and reworked Section 8.0 about three times with DOE writing tech support. We also discussed the option of issuing the standard for trial use and pilot application (TUPA) verses as an American National Standard certified by ANSI if we didn't have sufficient votes. Although not unanimous, the consensus of the working group was to move forward with acquiring approval of the document as an American National Standard. The draft will be finalized for a second ballot in 2011. The working group is confident that the draft will be approved via the reballot.

Subcommittee ANS-29 – Advanced Initiatives (GEN III-A/IV)

Membership:
Donald Spellman, Chair, Oak Ridge National Laboratory
James Saldarini, Vice Chair, Bechtel
Robert Budnitz, Lawrence Berkeley National Laboratory
James August, Core Incorporated
George Flanagan, Oak Ridge National Laboratory
Stu Rubin, U.S. Nuclear Regulatory Commission

The following active projects are under the management of ANS-29:

ANS-29.1, "Operational Reactivity Management and Oversight at Light Water, Pressurized Water Power Reactors" (new standard)

Scope:
This standard provides guidance for PWR operation and reactor engineering staffs regarding the care and prior planning of plant manipulations that can affect reactor reactivity as well as the review, post manipulation, to verify that reactivity performance met expectations

Membership: Louis Grobmyer, Chairman, Westinghouse

Status: It was determined that the scope of ANS-29.1 was redundant to requirements issued by INPO, and therefore, not in great need by the industry. A discussion at the June 2010 NFSC meeting cumulated in the decision to terminate ANS-29.1 as an active standards project.

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

Scope (unapproved):
This standard establishes a process that can be used to develop nuclear safety design criteria and functional design requirements for stationary light water reactor (LWR) nuclear power plants using both deterministic and risk-informed methods. LWR operation, maintenance, and testing requirements are addressed to the extent that they affect plant design. Individual system design requirements are provided in supporting standards.

Status: A decision was made by the Nuclear Facilities Standards Committee to reinvigorate the ANS-50.1 project once ANS-58.14, "Safety and Pressure Integrity Classification Criteria for Light Water Reactors," received ANSI approval. Approval of ANS-58.14 is expected in early 2011.

ANS-54.1, "Nuclear Safety Criteria and Design Process for Liquid-Sodium-Cooled Nuclear Power Plants" (historical revision of ANSI/ANS-54.1-1989 – 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, BNL; Robert Bari, BNL; Chris Grandy, ANL; Tony Grenci, Westinghouse; Thomas King, NRC (retired); Eric Loewen, GE; Imitiaz Madni, U.S. Nuclear Regulatory Commission; Hisato Matsumiya, Toshiba; Michel Vidard, Electricite de France; Roald Wigeland, INL

Status: A PINS was revised and resubmitted to ANSI. This revision was to reflect the narrowing of the scope to address only sodium-cooled reactors and not all liquid-metal reactors. The membership of the working group has been expanded to eleven members plus seven subject matter experts. A table of contents has been developed and draft sections of the standard have been developed and reviewed by working group members. Frequent teleconferences have been held and a meeting of the working group was convened at the ANS Winter Meeting in November of 2010. Plans are to complete a first draft of the standard for review by the working group by July of 2011.

Table 2

2010 Nuclear Facilities Standards Committee Organizational Chart							
ANS-21	ANS-22	ANS-24	ANS-25	ANS-26	ANS-27	ANS-28	ANS-29
Maintenance, Operations, Testing & Training	*Systems Design Criteria*	*Modeling & Analysis*	*Site Characteristics*	*Emergency Planning*	*Fuel Cycle, Waste Management & Decommissioning*	*HTGR Design Criteria*	*Advanced Initiatives*
Gene Carpenter (Chair) Sheila Lott (Vice-Chair)	Dennis Newton (Chair) Mike Ruby (Vice-Chair)	Andy Wehrenberg (Chair) Vacant (Vice-Chair)	Kevin Bryson (Chair) Carl Mazzola (Vice-Chair)	Evan Lloyd (Chair) Charles Brown (Vice-Chair)	Donald Eggett (Chair) Jeffrey Brault (Vice-Chair)	Jim August (Chair) Vacant (Vice-Chair)	Donald Spellman (Chair) James Saldarini (Vice-Chair)
2.10-2003 Criteria for the Handling and Initial Evaluation of Records from Nuclear Power Plant Seismic Instrumentation	2.26-2004 (R2010) Categorization of Nuclear Facility Structures, Systems and Components For Seismic Design	2.15 (NEW) Criteria for Modeling and Calculating Atmospheric Dispersion of Routine Releases from Nuclear Facilities	2.2-2002 Earthquake Instrumentation Criteria for Nuclear Power Plants	3.8.1 (W2005) Properties of Radiological Emergency Response Functions and Organizations for Nuclear Facilities	40.35 (W2001) Volume Reduction of Low-Level Radioactive Waste or Mixed Waste	53.1 (NEW) Nuclear Safety Design Process for Modular Helium-Cooled Reactor Plants	50.1 (NEW) Nuclear Safety Criteria for the Design of Light Water Reactor Plants
2.23-2002 (R2009) Nuclear Plant Response to an Earthquake	51.10-1991 (R2008) Auxiliary Feedwater Systems for PWR	2.16 (NEW) Criteria for Modeling Design-Basis Accidental Releases From Nuclear Facilities	2.3 (W1993) Estimating Tornado, Hurricane, and Extreme Straight Line Wind Characteristics at Nuclear Facility Sites	3.8.2 (W2005) Properties of Functional and Physical Characteristics of Radiological Emergency Response Facilities at Nuclear Facilities	40.37-2009 Mobile Radioactive Waste Processing Systems	Note: After 53.1 is completed, additional series-53 HTGR standards to be developed	54.1 (W1999) Nuclear Safety Criteria and Design Process for Liquid-Sodium-Cooled Nuclear Power Plants
3.1 (W2009) Selection, Qualification and Training of Personnel for Nuclear Power Plants	55.1-1992 (R2009) Solid Radioactive Waste Processing System for Light-Water-Cooled Reactor Plants	2.29-2008 Probabilistic Seismic Hazard Analysis	2.6 (NEW) Guidelines for Estimating Present and Forecasting Future Population Distributions Surrounding Power Reactor Sites	3.8.3 (W2005) Properties of Radiological Emergency Response Plans and Implementing Procedures and Maintaining Emergency Response Capability for Nuclear Facilities	57.1-1992 (R2005) Design Requirements for LWR Fuel Handling Systems		
3.2-2006 Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants	55.4-1993 (R2007) Gaseous Radioactive Waste Processing Systems for LWR Plants	3.8.10 (NEW) Criteria for Modeling Real-Time Accidental Release Consequences at Nuclear Facilities	2.8 (W2002) Determining Design Basis Flooding at Power Reactor Sites	3.8.6 (W2005) Properties of the Conduct of Offsite Radiological Assessment for Emergency Response and Emergency Radiological Field Monitoring, Sampling and Analysis for Nuclear Facilities	57.2 (W1983) Design Requirements for LWR Spent Fuel Facilities at Nuclear Power Plants		
3.4-1996 (R2002) Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants	55.6-1993 (R2007) Liquid Radioactive Waste Processing System for LWR Plants	5.4 (W1993) Method for Calculating the Fractional Release of Volatile Fission Products from Oxide Fuel	2.9 (W2000) Evaluation of Ground Water Supply for Nuclear Facilities	3.8.7 (W2008) Properties of Planning, Development, Conduct, and Evaluation of Drills and Exercises for Emergency Preparedness at Nuclear Facilities	57.3 (W1993) Design Requirements for New Fuel Storage Facilities at LWR Plants (N209)		
3.5-2009 Nuclear Power Plant Simulators for Use in Operator Training and Examination	58.3-1992 (R2008) Physical Protection for Nuclear Safety-Related Systems and Components	5.10-1998 (R2006) Airborne Release Fractions at Non-Reactor Nuclear Facilities	2.13 (W1998) Evaluation of Surface-Water Supplies for Nuclear Power Sites		57.5-1996 (R2006) LWRs Fuel Assembly Mechanical Design and Evaluation		
3.11-2005 (R2010) Determining Meteorological Information at Nuclear Facilities	58.8-1994 (R2008) Time Response Design Criteria for Safety-Related Operator Actions	16.1-2003 (R2008) Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-Term Test Procedure	2.17-2010 Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants		57.8-1995 (R2005) Fuel Assembly Identification		
56.8-2002 Containment System Leakage Testing Requirements	58.9-2002 (R2009) (reapproval of 58.9-1981) Single Failure Criteria for LWR Safety-Related Fluid Systems	18.1 (W2009) Radioactive Source Term for Normal Operation of Light Water Reactors	2.18 (NEW) Standards for Evaluating Radionuclide Transport in Surface Water for Nuclear Power Sites		57.9 (W2010) Design Criteria for an Independent Spent Fuel Storage Installation (Dry Type)		
58.6-1996 (2001) Criteria for Remote Shutdown for LWRs	58.11-1995 (R2002) Design Criteria for Safe Shutdown Following Selected Design Basis Events in LWRs	41.5 (NEW) Verification and Validation of Radiological Data for Use in Waste Management and Environmental Remediation	2.21 (NEW) Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink		57.10-1996 (R2006) Design Criteria for Consolidation of LWR Spent Fuel		
	58.14 (W2003) Safety and Pressure Integrity Classification Criteria for Light Water Reactors	58.2 (W1998) Design Basis for Protection of Light Water Nuclear Power Plants Against the Effects of Postulated Pipe Rupture	2.25 (W1999) Surveys of Terrestrial Ecology Needed to License Thermal Power Plants				
	58.16 (NEW) Safety Classification and Design Criteria for Non-Reactor Nuclear Facilities		2.27-2008 Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments				
	59.3-1992 (R2002) Nuclear Safety Criteria for Control Air Systems		2.30 (NEW) Assessing Capability for Surface Faulting at Nuclear Facilities				
	59.51-1997 (R2007) Fuel Oil Systems for Emergency Diesel Generators		2.31 (NEW) Estimating Extreme Precipitation at Nuclear Facility Sites				
	59.52-1998 (R2007) Lubricating Oil Systems for Safety-Related Emergency Diesel Generators		40.21 (NEW) Siting, Construction, and Operation of Commercial Low Level Radioactive Waste Burial Grounds				

RISC
Risk Informed Standards Committee

Robert J. Budnitz, Chair
Lawrence Berkeley National Laboratory

Scope:

The American Nuclear Society Risk Informed Standards Committee is responsible for the development and maintenance of standards that establish safety and risk criteria and methods for probabilistic analysis, risk assessment, and risk management. These criteria and methods are applicable to design, development, construction, operation, decontamination and decommissioning, waste management, and environmental restoration for nuclear facilities.

The RISC is directly responsible for the management of three working groups.

RISC Membership:

Robert J. Budnitz, Chair, Lawrence Berkeley National Laboratory
Paul J. Amico, Science Applications International Corporation
Robert A. Bari, Brookhaven National Laboratory
Richard Black, U.S. Department of Energy
Roy E. (Biff) Bradley, Nuclear Energy Institute
Allen L. Camp, Los Alamos National Laboratory
Mary T. Drouin, U.S. Nuclear Regulatory Commission
David J. Finnicum, Westinghouse Electric Corporation
John P. Gaertner, Electric Power Research Institute
Dennis W. Henneke, GE Infra, Energy
Richard A. Hill, ERIN Engineering and Research
Gene A. Hughes, ETRANCO
Kenneth L. Kiper, FPL Energy Company
Gregory A. Krueger, Exelon Nuclear
Stanley H. Levinson, AREVA NP
Mayasandra K. (Ravi) Ravindra, Individual
Jean B. Savy, Risk Management Solutions
Daniel W. (Bill) Stillwell, South Texas Project Nuclear Operating Company
Donald J. Wakefield, ABS Consulting

Alternates:
Barbara Baron (for David Finnicum), Westinghouse Electric Corporation
Doug Hance (for John Gaertner), Electric Power Research Institute
Bijan Najafi (for Paul Amico), Science Applications International Corporation
Doug E. True (for Rick Hill), ERIN Engineering & Research
James Young (for Dennis Henneke), GE Hitachi Nuclear Energy

Liaisons:
William (Bernie) Till, National Fire Protection Association

Observers:
William E. Burchill, Texas A&M University
Ching Guey, Tennessee Valley Authority
Andrew Kadak, Massachusetts Institute of Technology
Yehia F. Khalil, Yale University
Jeff T. Mitman, U.S. Nuclear Regulatory Commission

Charles H. Moseley, Individual
Mark Reinhart, Interaction Internationale
Selim Sancaktar, U.S. Nuclear Regulatory Commission
Fatma Yilmaz, Entergy Nuclear

Report of RISC

Robert Budnitz stepped up from vice chair to chair of the committee in January of 2010. A joint RISC/American Society of Mechanical Engineers (ASME) Committee of Nuclear Risk Management (CNRM) meeting was held on February 24, 2010, in Dallas, Texas. Additionally the RISC held a meeting on June 16, 2010, in San Diego, California. The RISC continues to work with CNRM in the development of probabilistic risk assessment standards and efforts are underway to merge the two consensus committees.

Active standards/projects:
ANS-58.22, "Low-Power Shutdown PRA Methodology" (new standard)

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

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

The following working groups report directly to the RISC:

ANS-58.22, "Low-Power Shutdown PRA Methodology" (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; Bryan Carroll, Duke; Doug Hance, EPRI; Jeffrey Julius, Curtiss Wright, LLC; Yehia F. Khalil, Yale University; Ken Kiper, FPL; Jeff Mitman, US Nuclear Regulatory Commission; Leo Shanley, ERIN; William Stillwell, South Texas Nuclear Utility; Rupert Weston, Westinghouse; Gene Hughes, ETRANCO; Jonathan Li, GE-Hitachi Nuclear Energy

Status: During 2010, the writing group addressed the consensus committee comments on the updated preliminary review draft of ANS-58.22 submitted at the RISC meeting on November 2, 2009. Approximately 150 new comments were received. The writing group has been working to resolve these comments prior to issuing an official ballot. One significant change was to make the standard compatible with the ASME/ANS RA-Sa-2009 combined standard for at-power events in terms of format, definitions, section outline, and naming conventions for high level and supporting requirements. RISC also agreed to ballot the updated version for trial use only. It has taken longer to

resolve these comments than expected. A new ballot is expected in the first half of 2011. One key comment remaining is the need for piloting the draft standard. The RISC is still seeking plant owners willing to serve in the near term as pilot plants with targeted applications for the different portions of the standard, i.e., for the quantitative portion for time-averaged risk calculations and for both the qualitative and quantitative portions for configuration risk management applications.

ANS/ASME-58.24, "Severe Accident Progression and Radiological Release (Level 2) PRA Methodology to Support Nuclear Installation Applications" (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:
Mark Leonard, Chair, dycoda, LLC; Paul Boneham, Jacobsen Engineering; David Bradley, SAIC; Edward Burns, ERIN Engineering; Aram Hakobyan, Dominion Resources, Inc.; Don Helton, U.S. Nuclear Regulatory Commission; John Lehner, Brookhaven National Laboratory; Jason Petti, Sandia National Laboratories; Raymond Schneider, Westinghouse Electric Corp.

Status: In January 2010, the working group delivered a first draft of the Level 2 PRA Standard, which was distributed to members of RISC and CNRM for comment. This first draft addressed technical requirements across the full scope of Level 2 analysis topics, but was restricted in scope to accident sequences initiated at full power by internal events. Comments on this draft were received from several members of the two review committees. Responses to these initial comments were developed by the working group and forwarded to commenters through ANS headquarter staff. At the end of the year, a revised version of the draft standard was nearly complete, which incorporated numerous changes needed to address the comments. An encouraging observation from the review of these comments was that the majority of the comments pointed to inconsistencies in the architecture or vocabulary used to define technical requirements rather than the validity or appropriateness of the requirements themselves. Further work is planned in early 2011 to address Level 2 PRA requirements associated with the remaining scope of Level 1 accident sequences, i.e., external initiating event and low-power/shutdown accident sequences.

ANS/ASME-58.25, "Standard for Radiological Accident Offsite Consequence Analysis (Level 3 PRA) to Support Nuclear Installation Applications" (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 non-reactor 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; Nathan Bixler, SNL; Sarah Chisholm, Duke Power Co.; David Johnson, ABS; Carl Mazzola, Shaw Environmental; Vinod Mubayi, BNL; Kevin O'Kula, WSMS; Doug Paul, Duke Power Co.

Status: In 2010, the working group received more than 300 comments and met several times to prepare responses that were included with the final draft that was submitted for ballot in late 2010. It was submitted for approval for TUPA (Trial Use and Pilot Applications) designation after considerable discussion. It should be noted that Jocelyn Mitchell, NRC, who was a significant contributor to our standard, passed away in the fall of 2010.

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
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;R2007 Conduct of Critical Experiments (Revision of ANSI/ANS-1-1987;R1992)	240242	$31.00
ANS-2.2-2002 Earthquake Instrumentation Criteria for Nuclear Power Plants (Revision of ANSI/ANS-2.2-1988)	240246	$44.00
ANS-2.10-2003 Criteria for the Handling and Initial Evaluation of Records from Nuclear Power Plant Seismic Instrumentation (Revision of ANSI/ANS-2.10-1979)	240251	$37.00
ANS-2.17-2010 Evaluation of Subsurface Radionuclide Transport at Commercial Nuclear Power Plants (supersedes ANS-2.17-1980;R1989)	240281	$109.00
ANS-2.23-2002;R2009 Nuclear Plant Response to an Earthquake	240244	$102.00
ANS-2.26-2004;R2010 Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design	240255	$94.00
ANS-2.27-2008 Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments	240272	$96.00
ANS-2.29-2008 Probabilistic Seismic Hazard Analysis	240275	$109.00
ANS-3.2-2006 Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants (Revision of ANSI/ANS-3.2-1994:R1999)	240262	$115.00
ANS-3.4-1996;R2002 Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants (Revision of ANSI/ANS-3.4-1983;R1988)	240218	$44.00
ANS-3.5-2009 Nuclear Power Plant Simulators for Use in Operator Training and Examination (Supersedes ANS-3.5-1998)	240271	$96.00
ANS-3.11-2005;R2010 Determining Meteorological Information at Nuclear Facilities (Revision of ANS-3.11-2000)	240260	$107.00
ANS-5.1-2005 Decay Heat Power in Light Water Reactors (Revision of ANSI/ANS-5.1-1994)	240256	$120.00
ANS-5.10-1998;R2006 Airborne Release Fractions at Non-Reactor Nuclear Facilities	240233	$104.00

CURRENT STANDARDS

ANS Designation	Order #	Price
ANS-6.1.2-1999;R2009 Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants (Revision of ANS-6.1.2-1989)	240236	$31.00
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)	240158	$62.00
ANS-6.4-2006 Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants (Revision of ANSI/ANS-6.4-1997;R2004)	240264	$164.00
ANS-6.4.2-2006 Specification for Radiation Shielding Materials (Revision of ANSI/ANS-6.4.2-1985;R1997;R2004)	240263	$62.00
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)	240153	$112.00
ANS-8.1-1998;R2007 Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors (Revision of ANSI/ANS-8.1-1983;R1988)	240234	$75.00
ANS-8.3-1997;R2003 Criticality Accident Alarm System (Revision of ANSI/ANS-8.3-1986)	240224	$81.00
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)	240220	$50.00
ANS-8.6-1983;R1988; R1995;R2001;R2010 Safety in Conducting Subcritical Neutron-Multiplication Measurements In Situ (Revision of N16.3-1975)	240119	$25.00
ANS-8.7-1998;R2007 Guide for Nuclear Criticality Safety in the Storage of Fissile Materials (Revision of N16.5-1975;R1982;R1987)	240235	$69.00
ANS-8.10-1983;R1988; R1999;R2005 Criteria for Nuclear Criticality Safety Controls in Operations With Shielding and Confinement (Revision of N16.8-1975)	240123	$37.00

CURRENT STANDARDS

ANS Designation	Order #	Price
ANS-8.12-1987;R1993;R2002 Nuclear Criticality Control and Safety of Plutonium-Uranium Fuel Mixtures Outside Reactors (Revision of ANS-8.12-1978)	240163	$75.00
ANS-8.14-2004 Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors	240253	$37.00
ANS-8.15-1981;R1987; R1999;R2005 Nuclear Criticality Control of Special Actinide Elements	240102	$69.00
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;R1997)	240254	$37.00
ANS-8.19-2005 Administrative Practices for Nuclear Criticality Safety (Revision of ANSI/ANS-8.19-1969)	240257	$31.00
ANS-8.20-1991;R1999; R2005 Nuclear Criticality Safety Training	240178	$37.00
ANS-8.21-1995;R2001 Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors	240204	$37.00
ANS-8.22-1997;R2006 Nuclear Criticality Safety Based on Limiting and Controlling Moderators	240227	$44.00
ANS-8.23-2007 Nuclear Criticality Accident Emergency Planning and Response (Revision of ANSI/ANS-8.23-1997)	240269	$94.00
ANS-8.24-2007 Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations	240266	$87.00
ANS-8.26-2007 Criticality Safety Engineer Training and Qualification Program	240268	$31.00
ANS-8.27-2008 Burnup Credit for Light Water Reactor Fuel	240273	$37.00
ANS-10.2-2000;R2009 Portability of Scientific and Engineering Software (Revision of ANSI/ANS-10.2-1988)	240243	$37.00
ANS-10.4-2008 Verification and Validation of Non-Safety Related Scientific and Engineering Computer Programs for the Nuclear Industry (Revision of ANS-10.41987;R1998)	240277	$103.00

CURRENT STANDARDS

ANS Designation — Order # — Price

ANS-10.5-2006 240261 $44.00
Accommodating User Needs in Scientific and Engineering Software Development
(Revision of ANS-10.5-1994)

ANS-14.1-2004;R2009 240252 $37.00
Operation of Fast Pulse Reactors
(Revision of ANS-14.1-1975;R1982;R1989;R2000)

ANS-15.1-2007 240176 $75.00
The Development of Technical Specifications for Research Reactors
(Revision of ANSI/ANS-15.1-1990;R1999)

ANS-15.2-1999;R2009 240237 $50.00
Quality Control for Plate-Type Uranium-Aluminum Fuel Elements
(Revision of ANSI/ANS-15.2-1990)

ANS-15.4-2007 240272 $56.00
Selection and Training of Personnel for Research Reactors
(Revision of ANS-15.4-1988;R1999)

ANS-15.8-1995;R2005 240215 $50.00
Quality Assurance Program Requirements for Research Reactors
(Revision of ANSI/ANS-15.8-1976;R1986)

ANS-15.11-2009 240279 $98.00
Radiation Protection at Research Reactor Facilities
(Revision of ANSI/ANS-15.11-1993;R2004)

ANS-15.16-2008 240276 $50.00
Emergency Planning for Research Reactors
(Revision of ANS-15.16-1982; R1988;R2000)

ANS-15.21-1996;R2006 240222 $115.00
Format and Content for Safety Analysis Reports for Research Reactors

ANS-16.1-2003;R2008 240249 $107.00
Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-Term Test Procedure
(Revision of ANSI/ANS-16.1-1986)

ANS-19.1-2002 240250 $56.00
Nuclear Data Sets for Reactor Design Calculations
(Revision of ANSI/ANS-19.1-1983;R1989)

ANS-19.3-2005 240258 $96.00
Determination of Steady State Neutron Reaction Rate Distributions and Reactivity of Nuclear Power Reactors
(Revision of ANSI/ANS-19.3-1995)

ANS-19.3.4-2002;R2008 240245 $44.00
The Determination of Thermal Energy Deposition Rates in Nuclear Reactors
(Revision of ANSI/ANS-19.3.4-1976;R1983;R1989)

ANS-19.6.1-2005 240259 $94.00
Reload Startup Physics Tests for Pressurized Water Reactors
(Revision of ANSI/ANS-19.6.1-1997)

ANS-19.10-2009 240278 $43.00
Methods for Determining Neutron Fluence in BWR and PWR Pressure Vessel and Reactor Internals

CURRENT STANDARDS

ANS Designation — Order # — Price

ANS-19.11-1997;R2002 240226 $75.00
Calculation and Measurement of the Moderator Temperature Coefficient of Reactivity for Water Moderated Power Reactors

ANS-40.37-2009 240280 $116.00
Mobile Low Level Radioactive Waste Processing Systems
(Supersedes ANS-40.37-1993)

ANS-51.10-1991;R2002;R2008 240177 $87.00
Auxiliary Feedwater System for Pressurized Water Reactors
(Revision of ANSI/ANS-51.10-1979)

ANS-55.1-1992;R2000;R2009 240193 $117.00
Solid Radioactive Waste Processing System for Light-Water-Cooled Reactor Plants
(Revision of ANSI/ANS-55.1-1979)

ANS-55.4-1993;R1999;R2007 240194 $102.00
Gaseous Radioactive Waste Processing Systems for Light Water Reactor Plants
(Revision of ANSI/ANS-55.4-1979)

ANS-55.6-1993;R1999;R2007 240195 $104.00
Liquid Radioactive Waste Processing System for Light Water Reactor Plants
(Revision of ANSI/ANS-55.6-1979)

ANS-56.8-2002 240247 $107.00
Containment System Leakage Testing Requirements
(Revision of ANSI/ANS-56.8-1994)

ANS-57.1-1992;R1998; R2005 240186 $56.00
Design Requirements for Light Water Reactor Fuel Handling Systems
(Revision of ANSI/ANS-57.1-1980)

ANS-57.5-1996;R2006 240217 $69.00
Light Water Reactors Fuel Assembly Mechanical Design and Evaluation
(Revision of ANS-57.5-1981)

ANS-57.8-1995;R2005 240205 $37.00
Fuel Assembly Identification
(Revision of ANSI/ANS-57.8-1978;R1987)

ANS-57.10-1996;R2006 240221 $107.00
Design Criteria for Consolidation of LWR Spent Fuel (Revision of ANSI/ANS-57.10-1987)

ANS-58.3-1992;R1998; R2008 240184 $109.00
Physical Protection for Nuclear Safety-Related Systems and Components
(Revision of ANSI/ANS-58.3-1977)

ANS-58.6-1996;R2001 240214 $44.00
Criteria for Remote Shutdown for Light Water Reactors
(Revision of ANSI/ANS-58.6-1983;R1989)

ANS-58.8-1994;R2001;R2008 240202 $69.00
Time Response Design Criteria for Safety-Related Operator Actions
(Revision of ANSI/ANS-58.8-1984)

ANS-58.9-2002;R2009 240091 $37.00
Single Failure Criteria for Light Water Reactor Safety-Related Fluid Systems
(same as ANS-58.9-1981;R1987)

CURRENT STANDARDS

ANS Designation — Order # — Price

ANS-58.11-1995;R2002 240207 $56.00
Design Criteria for Safe Shutdown Following Selected Design Basis Events in Light Water Reactors
(Revision of ANSI/ANS-58.11-1983;R1989)

ANS-59.3-1992;R2002 240187 $44.00
Nuclear Safety Criteria for Control Air Systems
(Revision of ANSI/ANS-59.3-1984)

ANS-59.51-1997;R2007 240229 $62.00
Fuel Oil Systems for Safety-Related Emergency Diesel Generators
(Revision of ANSI/ANS-59.51-1989)

ANS-59.52-1998;R2007 240232 $56.00
Lubricating Oil Systems for Safety-Related Emergency Diesel Generators

HISTORICAL STANDARDS

ANS Designation — Order # — Price

ANS-1-1987;R1992 240159 $31.00
Safety Guide for the Performance of Critical Experiments

ANS-2.2-1988 240160 $62.00
Earthquake Instrumentation Criteria for Nuclear Power Plants

ANS-2.3-1983 240122 $62.00
Standard for Estimating Tornado and Extreme Wind Characteristics at Nuclear Power Sites

ANS-2.7-1982 240105 $44.00
Guidelines for Assessing Capability for Surface Faulting at Power Reactor Sites

ANS-2.8-1992 240183 $136.00
Determining Design Basis Flooding at Power Reactor Sites

ANS-2.9-1980;R1989 240005 $75.00
Evaluation of Ground Water Supply for Nuclear Power Sites

ANS-2.10-1979 240006 $69.00
Guidelines for Retrieval, Review, Processing and Evaluation of Records Obtained from Seismic Instrumentation

ANS-2.11-1978;R1989 240007 $104.00
Guidelines for Evaluating Site-Related Geotechnical Parameters at Nuclear Power Sites

ANS-2.12-1978 240008 $128.00
Guidelines for Combining Natural and External Man-Made Hazards at Power Reactor Sites

ANS-2.13-1979;R1988 240009 $94.00
Evaluation of Surface-Water Supplies for Nuclear Power Sites

ANS-2.17-1980;R1989 240010 $87.00
Evaluation of Radionuclide Transport in Ground Water for Nuclear Power Sites

HISTORICAL STANDARDS

ANS Designation	Order #	Price
ANS-2.19-1981;R1990 Guidelines for Establishing Site-Related Parameters for Site Selection and Design of an Independent Spent Fuel Storage Installation	240094	$112.00
ANS-2.25-1982;R1989 Surveys of Terrestrial Ecology Needed to License Thermal Power Plants (Formerly known as ANS-18.5)	240110	$96.00
ANS-3.1-1993; R1999 Selection, Qualification, and Training of Personnel for Nuclear Power Plants	240188	$69.00
ANS-3.2-1994;R1999 Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants	240198	$123.00
ANS-3.3-1988 Security for Nuclear Power Plants	240169	$62.00
ANS-3.4-1983;R1988 Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants	240114	$37.00
ANS-3.5-1998 Nuclear Power Plant Simulators for Use in Operator Training and Examination	240231	$87.00
ANS-3.7.1-1995 Facilities and Medical Care for On-Site Nuclear Power Plant Radiological Emergencies	40213	$50.00
ANS-3.8.1-1995 Criteria for Radiological Emergency Response Functions and Organizations	240208	$87.00
ANS-3.8.2-1995 Criteria for Functional and Physical Characteristics of Radiological Emergency Response Facilities	240209	$50.00
ANS-3.8.3-1995 Criteria for Radiological Emergency Response Plans and Implementing Procedures	240210	$50.00
ANS-3.8.4-1995 Criteria for Maintaining Radiological Emergency Response Capability	240211	$37.00
ANS-3.8.5-1992 Criteria for Emergency Radiological Field Monitoring, Sampling, and Analysis	240190	$44.00
ANS-3.8.6-1995 Criteria for the Conduct of Offsite Radiological Assessment for Emergency Response for Nuclear Power Plants	240212	$50.00
ANS-3.8.7-1998 Criteria for Planning, Development, Conduct, and Evaluation of Drills and Exercises for Emergency Preparedness	240230	$50.00
ANS-3.11-2000 Determining Meteorological Information at Nuclear Facilities	240241	$102.00
ANS-4.5-1980; R1986 Criteria for Accident Monitoring Functions in Light-Water-Cooled Reactors	240020	$56.00

HISTORICAL STANDARDS

ANS Designation	Order #	Price
ANS-5.1-1994 Decay Heat Power in Light Water Reactors	240200	$120.00
ANS-5.4-1982 Method for Calculating the Fractional Release of Volatile Fission Products from Oxide Fuel	240107	$37.00
ANS-6.1.1-1991 Neutron and Gamma-Ray Fluence-to-Dose Factors	240179	$81.00
ANS-6.1.2-1989 Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants	240174	$31.00
ANS-6.4-1997;R2004 Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants	240223	$156.00
ANS-6.4.2-1985;R1997; R2004 Specifications for Radiation Shielding Materials	240136	$150.00
ANS-6.4.3-1991 Gamma-Ray Attenuation Coefficients and Buildup Factors for Engineering Materials	240180	$184.00
ANS/HPSSC-6.8.1-1981 Location and Design Criteria for Area Radiation Monitoring Systems for Light Water Nuclear Reactors	240089	$56.00
ANS/IEEE-7.4.3.2-1982; R1990 Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations	240106	$50.00
ANS-8.1-1983;R1988 Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors	240118	$69.00
ANS-8.3-1986 Criticality Accident Alarm System	240147	$56.00
ANS-8.5-1986 Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material	240142	$50.00
ANS-8.7-1975;R1982;R1987 Guide for Nuclear Criticality Safety in the Storage of Fissile Materials (Formerly known as N16.5)	240031	$69.00
ANS-8.9-1987;R1995 Nuclear Criticality Safety Guide for Pipe Intersections Containing Aqueous Solutions of Enriched Uranyl Nitrate	240149	$44.00
ANS-8.17-1984;R1997 Criticality Safety Criteria for the Handling, Storage and Transportation of LWR Fuel Outside Reactors	240216	$31.00
ANS-8.19-1996 Administrative Practices for Nuclear Criticality Safety	240219	$25.00
ANS-8.23-1997 Nuclear Criticality Accident Emergency Planning and Response	240228	$37.00

HISTORICAL STANDARDS

ANS Designation	Order #	Price
ANS-10.2-1988 Recommended Programming Practices to Facilitate the Portability of Scientific and Engineering Computer Programs	240164	$37.00
ANS-10.3-1995 Documentation of Computer Software	240201	$44.00
ANS-10.4-1987;R1998 Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry	240150	$109.00
ANS-10.5-1994 Accommodating User Needs in Computer Program Development	240196	$44.00
ANS-14.1-1975;R1982; R1989;R2000 Operation of Fast Pulse Reactors (Formerly known as N394)	240040	$25.00
ANS-15.1-1990;R1999 The Development of Technical Specification for Research Reactors	240176	$56.00
ANS-15.2-1990 Quality Control for Plate-Type Uranium-Aluminum Fuel Elements	240175	$44.00
ANS-15.4-1988;R1999 Selection and Training of Personnel for Research Reactors (Revision of ANSI/ANS-15.4-1977)	240165	$44.00
ANS-15.7-1977;R1986 Research Reactor Site Evaluation	240046	$50.00
ANS-15.8-1976;R1986 Quality Assurance Program Requirements for Research Reactors (Formerly known as N402)	240047	$31.00
ANS-15.10-1994 Decommissioning of Research Reactors	240199	$94.00
ANS-15.11-1993;R2004 Radiation Protection at Research Reactor Facilities	240189	$96.00
ANS-15.12-1977 Design Objectives for and Monitoring of Systems Controlling Research Reactor Effluents	240049	$25.00
ANS-15.15-1978;R1986 Criteria for the Reactor Safety Systems of Research Reactors	240050	$50.00
ANS-15.16-1982;R1988; R2000 Emergency Planning for Research Reactors	240108	$44.00
ANS-15.17-1981;R1987; R2000 Fire Protection Program Criteria for Research Reactors	240096	$37.00
ANS-15.19-1991 Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor Facilities	240181	$75.00

HISTORICAL STANDARDS

ANS Designation — Order # — Price

ANS-16.1-1986 240148 $109.00
Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-Term Test Procedure

ANS-18.1-1999 240238 $75.00
Radioactive Source Term for Normal Operation of Light Water Reactors

ANS-19.1-1983;R1989 240121 $50.00
Nuclear Data Sets for Reactor Design Calculations

ANS-19.3-1995 240216 $96.00
Determination of Steady State Neutron Reaction Rate Distributions and Reactivity of Nuclear Reactors

ANS-19.3.4-1976; R1983;R1989 240056 $44.00
The Determination of Thermal Energy Deposition Rates in Nuclear Reactors
(Formerly known as N676)

ANS-19.4-1976;R1983; R1989;R2000 240057 $62.00
A Guide for Acquisition and Documentation of Reference Power Reactor Physics Measurements for Nuclear Analysis Verification
(Formerly known as N652-1976)

ANS-19.5-1995 240206 $25.00
Requirements for Reference Reactor Physics Measurements

ANS-19.6.1-1997 240225 $102.00
Reload Startup Physics Tests for Pressurized Water Reactors

ANS-40.35-1991 240182 $87.00
Volume Reduction of Low-Level Radioactive Waste or Mixed Waste

ANS-40.37-1993 240192 $112.00
Mobile Radioactive Waste Processing Systems

ANS-51.1-1983;R1988 240116 $166.00
Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants

ANS-51.10-1979 240062 $87.00
Auxiliary Feedwater System for Pressurized Water Reactors

ANS-52.1-1983;R1988 240117 $164.00
Nuclear Safety Criteria for the Design of Stationary Boiling Water Reactor Plants

ANS-54.1-1989 240171 $69.00
General Safety Design Criteria for a Liquid Metal Reactor Nuclear Power Plant

ANS-54.2-1985 240138 $56.00
Design Bases for Facilities for LMFBR Spent Fuel Storage in Liquid Metal Outside the Primary Coolant Boundary

ANS-55.4-1979 240066 $128.00
Gaseous Radioactive Waste Processing System for Light Water Reactor Plants

HISTORICAL STANDARDS

ANS Designation — Order # — Price

ANS-55.6-1979 240067 $117.00
Liquid Radioactive Waste Processing System f or Light Water Reactor Plants

ANS-56.2-1984;R1989 240135 $142.00
Containment Isolation Provisions for Fluid Systems After a LOCA

ANS-56.3-1977;R1987 240069 $44.00
Overpressure Protection of Low Pressure Systems Connected to the Reactor Coolant Pressure Boundary

ANS-56.4-1983;R1988 240127 $109.00
Pressure and Temperature Transient Analysis for Light Water Reactor Containments

ANS-56.5-1979;R1987 240070 $102.00
PWR and BWR Containment Spray System Design Criteria

ANS-56.6-1986 240146 $81.00
Pressurized Water Reactor Containment Ventilation Systems

ANS-56.7-1978;R1987 240072 $94.00
Boiling Water Reactor Containment Ventilation Systems

ANS-56.8-1994 240197 $107.00
Containment System Leakage Testing Requirements

ANS-56.10-1982;R1987 240109 $102.00
Subcompartment Pressure and Temperature Transient Analysis in LWRs

ANS-56.11-1988 240166 $56.00
Design Criteria for Protection Against the Effects of Compartment Flooding in LWR Plants

ANS-57.1-1980 240074 $56.00
Design Requirements for Light Water Reactor Fuel Handling Systems

ANS-57.2-1983 240124 $99.00
Design Requirements for Light Water Reactor Spent Fuel Storage Facilities at Nuclear Power Plants

ANS-57.3-1983 240112 $50.00
Design Requirements for New Fuel Storage Facilities at Light Water Reactor Plants

ANS-57.5-1981 240090 $69.00
Light Water Reactors Fuel Assembly Mechanical Design and Evaluation

ANS-57.7-1988;R1997 240170 $117.00
Design Criteria for an Independent Spent Fuel Storage Installation (Water Pool Type)

ANS-57.8-1978;R1987 240078 $31.00
Fuel Assembly Identification

ANS-57.9-1992;R2000 240185 $138.00
Design Criteria for an Independent Spent Fuel Storage Installation (Dry Type)

HISTORICAL STANDARDS

ANS Designation — Order # — Price

ANS-57.10-1987 240162 102.00
Design Criteria for Consolidation of LWR Spent Fuel

ANS-58.2-1988 240167 $151.00
Design Basis for Protection of Light Water Nuclear Power Plants Against the Effects of Postulated Pipe Rupture

ANS-58.3-1977 240080 $87.00
Physical Protection for Systems and Components Important to Safety

ANS-58.4-1979 240081 $75.00
Criteria for Technical Specifications for Nuclear Power Stations

ANS-58.6-1983;R1989 240113 $44.00
Criteria for Remote Shutdown for Light Water Reactors

ANS-58.8-1984 240131 $56.00
Time Response Design Criteria for Nuclear Safety Related Operator Actions

ANS-58.11-1983;R1989 240115 $50.00
Cooldown Criteria for Light Water Reactors

ANS-58.14-1993 240203 $153.00
Safety and Pressure Integrity Classification Criteria for Light Water Reactors

ANS-58.21-2007 240265 $186.00
External-Events in PRA Methodology

ANS-58.23-2007 240270 $169.00
Fire-PRA Methodology

ANS-59.1-1986 240143 $56.00
Nuclear Safety Related Cooling Water Systems for Light Water Reactors

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