ANSI/ANS Meteorological Voluntary Consensus Standards

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ANSI/ANS STRUCTURE

- American National Standards Institute (ANSI)
- ANS (SDO) Standards Committee
- ANS Nuclear Facilities Standards Committee (NFSC): 118 Voluntary Consensus Standards
  - ANS-21: Nuclear Power Plant Design Criteria & Operations
  - ANS-22:Nuclear Power System Level Design
  - ANS-23:Decommissioning and Site Remediation
  - ANS-24:Analysis

ANS SDO STRUCTURE

- ANS Nuclear Facilities Standards Committee (NFSC)
  - **ANS-25: Siting**
  - ANS-26: Emergency Planning
  - ANS-27:Fuel Cycle and Waste Management
  - ANS-28:Gas-Cooled Reactor Standards

ANS-25 METEOROLOGICAL STANDARDS

- ANS-25 Meteorological Standards
  - ANSI/ANS-3.11, *Determining Meteorological Information at Nuclear Facilities*
  - ANSI/ANS-2.3, *Determining Tornado and Other Extreme Wind Characteristics at Nuclear Facility Sites*
  - ANSI/ANS-2.15, *Criteria for Modeling and Calculating Atmospheric Transport of Routine Releases from Nuclear Facilities*

ANS-25 METEOROLOGICAL STANDARDS

- ANS-25 Meteorological Standards (Continued):
  - ANSI/ANS-2.16, *Criteria for Modeling Design-Basis Accidental Releases from Nuclear Facilities*
  - ANSI/ANS-2.21, *Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink*
  - ANSI/ANS-3.8.10*, Criteria for Modeling Real-Time Releases at Nuclear Facilities*

ANS-25 STANDARDS THAT ADDRESS OTHER ENVIRONMENTAL DISCIPLINES

- ANSI/ANS-2.2,*Earthquake Instrumentation Criteria for Nuclear Power Plants* (Active)
- ANSI/ANS-2.6,*Guidelines for Estimating Present and Forecasting Future Population Distributions Surrounding Power Reactor Sites* (PINS under development)
- ANSI/ANS-2.8,*Determining Design Basis Flooding at Power Reactor Sites* (Seeking Chairperson)
- ANSI/ANS-2.9*, Evaluation of Ground Water Supply for Nuclear Facilities (WG developing draft)*
- ANSI/ANS-2.17, *Evaluation of Radionuclide Transport in Ground Water for Nuclear Facilities (WG developing draft)*
- ANSI/ANS-2.18, *Standards for Evaluating Radionuclide Transport in Surface Water for Nuclear Power Sites (Seeking Chairperson)*

ANS-25 STANDARDS THAT ADDRESS OTHER ENVIRONMENTAL DISCIPLINES

- **ANSI/ANS-2.22**, *Environmental Radiological Monitoring at Nuclear Facilities (WG developing draft)*
- **ANSI/ANS-2.25**, *Surveys of Terrestrial Ecology Needed to License Thermal Power Plants* (Seeking Chairperson)
- **ANSI/ANS-2.27**, *Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments (Draft in NFSC review)*
- **ANSI/ANS-2.29**, *Probabilistic Seismic Hazard Analysis (WG developing 6th draft)*
- **ANSI/ANS-2.30**, *Assessing Capability for Surface Faulting at Nuclear Facilities (PINS approved)*
- **ANSI/ANS-16.1**, *Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-Term Test Procedure* (Active)
- **ANSI/ANS-40.21**, *Siting and Operating Commercial Burial Grounds (PINS under development)*

ANSI/ANS-3.11

- DMCC and NUMUG joint venture
- Initiated at June 1996 ANS Meeting in Reno
- Issued February 16, 2000
- ANS' best selling standard (2000-2002)
- Stan Marsh (SCE) and Carl Mazzola (Shaw Environmental) co-chairs
- Active involvement by NRC, DOE and EPA
- Developed by WG of 30 SMEs

ANSI/ANS-3.11

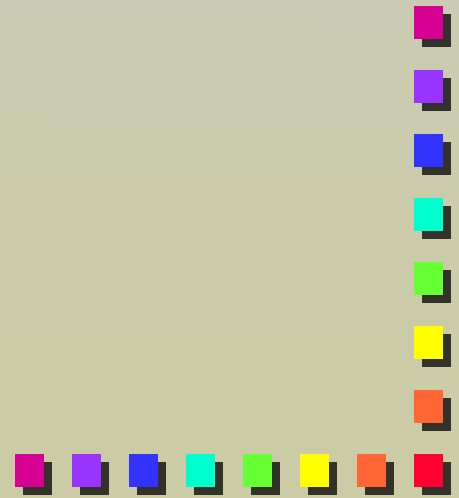
- Faced a December 2005 sunset
- Needed reaffirmation, revision or withdrawn
- Questionnaire to WG in 2002 showed strong support for revision (advances in in situ and remote sensing)
- Working group approved preparation of a revision at February 2003 DMCC Meeting
- Revised standard approved by ANSI in December 2005. Available for purchase in May 2006

ANSI/ANS-3.11 MAJOR REVISIONS

- Added sensor accuracy and stability class definitions
- Made supplemental measurements discussion more generic
- Revised specifications for winds, solar and net radiation, and barometric pressure
- Introduced new method for accuracy calculations

ANSI/ANS-3.11 MAJOR REVISIONS

- Required calibrations to be part of the system's Quality Assurance program
- Added calibration requirements
- Made numerous editorial and clarity revisions



METEOROLOGICAL APPLICATIONS STANDARD DEVELOPMENT

- ANSI/ANS-3.11 WG meeting in January 2004: Pursue development of additional standards related to application of meteorological data
- Carl Mazzola reinvigorated 4 abandoned standards from early 1980s. He and Doyle Pittman (TVA) co-chairs in March 2004
- PINS for ANSI/ANS-2.15, -2.16, and -2.21 sent to NFSC in July 2004 for comment
- ANSI/ANS-3.8.10 needed for real-time transport and dispersion modeling

METEOROLOGICAL APPLICATIONS STANDARD DEVELOPMENT

- Sept 2004: Assembled 20-member SME WG
- Nov 2004: ANS-2.15 WG kickoff meeting
- PINS have been approved for all 4 standards
- June 2006: First WG draft of ANS-2.15
- Other three standards will follow
- Need more SMEs for ANSI/ANS-2.21

ANSI/ANS-2.15, -2.16, -2.21, -3.8.10 Working Group Members

Mark Abrams	ABS Group
Tom Bellinger	IEMA
Chris Cook	PNNL
Y. J. Lin	Bechtel
Jim Fairobent	NNSA/NA-41
Cliff Glantz	PNNL
Brad Harvey	NRC NRR
Chuck Hunter	SRNL
Marsha Kinley	Duke Power
Joe Laznow	Consultant
Ed McCarthy	PG&E
John Nasstrom	LLNL NARAC
Kevin O'Kula	WSMS
Darryl Randerson	NOAA ARL/SORD
Ali Simpkins	Formerly of SRNL
Steve Vigeant	Shaw Environmental
Ping Wan	Bechtel
Ken Wastrack	TVA

ANSI/ANS-2.15

- *Criteria for Modeling and Calculating Atmospheric Transport of Routine Releases from Nuclear Facilities*
- To establish criteria for use of meteorological data collected at nuclear facilities to evaluate the atmospheric effects on routine radioactive releases, inclusive of dilution, dispersion, plume rise, plume meander, aerodynamic effects of buildings, dry deposition, and wet deposition (e.g., precipitation scavenging).
- ANSI/ANS-3.11 (2000), R. G. 1.111, ANSI/ANS 5.10, ANSI/ANS 18.1

ANSI/ANS-2.16

- *Criteria for Modeling Design-Basis Accidental Releases from Nuclear Facilities*
- To establish criteria for use of meteorological data collected at nuclear facilities to evaluate the atmospheric effects on accidental radioactive and hazardous chemical releases, inclusive of dilution, dispersion, plume rise, plume meander, aerodynamic effects of buildings, dry deposition, and wet deposition (e.g., precipitation scavenging)
- ANSI/ANS-3.11 (2000), ANSI/ANS-3.8.6-1995, ANSI/ANS 5.4, ANSI/ANS 5.10, ANSI/ANS 58.8, RG 1.78, RG 1.145, and RG 1.194
- WG decided to separate design basis and emergency applications into two standards

ANSI/ANS-3.8.10

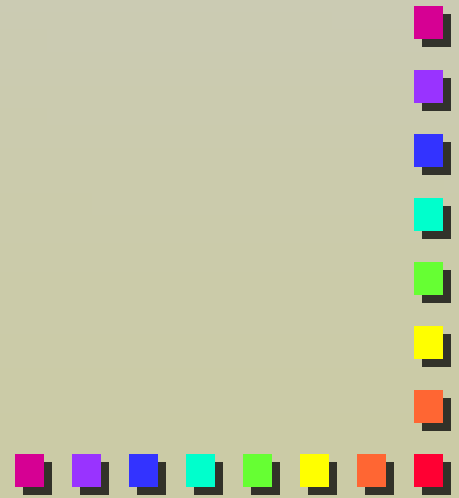
- *Criteria for Modeling Design-Basis Accidental Releases from Nuclear Facilities Under Emergency Conditions*
- To establish criteria for use of meteorological data collected at nuclear facilities to evaluate the atmospheric effects on accidental radioactive and hazardous chemical releases, inclusive of dilution, dispersion, plume rise, plume meander, aerodynamic effects of buildings, dry deposition, and wet deposition (e.g., precipitation scavenging)
- NUREG-0654; DOE Order 151.1C; Consequence Assessment Emergency Management Guide (12/20/05 Draft)

ANSI/ANS-2.21

- *Criteria for Assessing Atmospheric Effects on the Ultimate Heat Sink*
- To establish criteria for use of meteorological data collected at nuclear facilities to evaluate the atmospheric effects on ultimate heat sink performance.
- ANSI/ANS-3.11 (2000), R.G. 1.27

ANSI/ANS-2.3

- *Standard for Estimating Tornado, Hurricane and Extreme Straight Wind Characteristics at Nuclear Facility Sites*
- To establish criteria for use of meteorological data to evaluate the effects of extreme winds on nuclear facility design.
- ANSI/ANS-3.11 (2000), R.G. 1.76
- PNNL (Ramsdell) and LLNL Tornado NUREG/CRs



ANSI/ANS-2.3 Working Group Members

John Stevenson (Chairman)	J. Stevenson and Associates
Carl Mazzola	Shaw Environmental
Brad Harvey	NRC NRR
Jeff Kimball	NNSA
Emil Simiu	NIST
Mo Amin	Sargent & Lundy
Antonio Godoy	IAEA
Quazi Hossein	LLNL
Jim McDonald	Consultant
Art Buslick	NRC

ANSI/ANS-2.3

- Objective: Reconcile different DOE and NRC methodologies using PNNL and NRC technical reports as technical bases
- Address straight line winds as well as tornadoes
- Incorporate new Fujita Scale ranges
- Incorporate new information learned from 2005 Category V Hurricanes Katrina, Rita and Wilma
- Draft for consensus review by Fall 2006

HOW TO PURCHASE AN ANS STANDARD?

- ANS Store: http://www.ans.org/store/vc-stnd
- Sue Cook/ANS Order Department: scook@ans.org
- For standards information contact ANS Administrator, Pat Schroeder: pschroeder@ans.org

HOW TO VOLUNTEER?

- Send to depittma@tva.gov or carl.mazzola@shawgrp.com or jstevenson4@earthlink.net