



*Status Update on  
ANSI/ANS-2.5 Revisions*

*Nuclear Utility Meteorological  
Data Users Group  
(NUMUG)*

# Status Update on ANSI/ANS-2.5 Revisions

- **Purpose** Report on NUMUG's effort to initiate a revision to ANSI/ANS-2.5, Standard for Determining Meteorological Information at Nuclear Power Sites.
- **Objective** Revise the current standard to reflect the current operational and regulatory climate and incorporate state-of-the-art data acquisition, processing, and recording technology.
- **Goal** Update the current standard emphasizing **clarification** of existing issues and **providing** additional guidance **without** imposing new requirements.

# *Status Update on ANSI/ANS- 2.5 Revisions*

## ■ *Why Revise ANSI/ANS-2.5?*

- *Weaknesses in current version*

- *Outdated (Sept. 1984)*
- *Does not reflect current operational and regulatory climate*
- *Does not reflect state-of-the-art data acquisition, processing, and recording technology*
- *Inconsistent with USEPA and ASTM guidance*

# Status Update on ANSI/ANS-2.5 Revisions

## ■ History:

- *April 1993: Comments on ANSI/ANS-2.5-1984 compiled from all NUMUG attendees.*
- *April 1994: Recommended revisions submitted jointly to Dr. Frank Congel, NRC, and ANS. (Exhibit 1)*
- *July 1994: NRC response. (Exhibit 2)*
- *October 1994: Survey of NUMUG members' interest in participating in ANSI process.*
- *January 1995: List of NUMUG members interested in serving on new ANS-2.5 Subcommittee submitted to Dr. Jean Savy, Chair of ANS-2 Subcommittee, Site Evaluation, of the Nuclear Power Plant Standards Committee (NUPPSCO)*
- *Stan Marsh appointed to ANS-2 (Responsible for preparation of site evaluation standards for nuclear power plants including meteorology.)*
- *Previous ANS-2.5 members contacted to determine interest in chairing new Subcommittee.*

# Exhibit 1

## *Recommended Revisions To ANSI/ANS-2.5-1984 American National Standard For Determining Meteorological Information At Nuclear Power Sites*

*American National Standard For Determining Meteorological Information At Nuclear Power Sites (ANSI/ANS-2.5) will be ten years old this year. The nuclear power industry, regulatory requirements, instrumentation and equipment technology, and analysis techniques have all evolved and have different characteristics from those that existed when ANSI/ANS-2.5 was issued (September 1984). To meet the current needs of the nuclear power industry, the Nuclear Utility Meteorological Data Users Group (NUMUG) believes that the guidelines and standards for the meteorological data acquisition and processing at nuclear power sites should reflect the current operations and regulatory climate as well as the state-of-the-art data acquisition, processing, and recording technology.*

*NUMUG members, in both written communication and at the April 1993 NUMUG meeting in Boston, have identified specific ANSI/ANS-2.5 topics and issues that they believe need to be revised or updated subsequent to review by the ANS-2.5 Working Group. The following summary of NUMUG identified updates is provided to support our recommendation that the current ANSI/ANS-2.5 document be revised to reflect current operational, regulatory, and technological climates.*

### *Section 1    General Recommendations*

- 1) Meteorological data are currently provided at nuclear facilities to support three functions: 1) Probable Risk Assessments, 2) Emergency Release Assessments, and 3) Routine Release Assessments. It is important that the standards and guidelines for meteorological data at nuclear facilities reflect their current nuclear applications (i. e., stress operations rather than licensing).*
- 2) The ANSI/ANS-2.5 document should provide the complete guidelines and acceptance criteria for meteorological data acquisition programs at nuclear power plants. This document, as well as Regulatory Guides 1.23 and 1.97, are used as the basis of each plant's meteorological program.*
- 3) Advancements in instrumentation, data processing, and recording equipment, and in remote interrogation capabilities have made some parts of ANSI/ANS-2.5 dated.*
- 4) ANSI/ANS-2.5 guidelines and standards should include, or be more consistent with, more recent ASTM and USEPA references that address sensors, recording, testing, and processing of meteorological variables. (See Section 9 for references)*

## **Section 2    Definitions**

- 1) *Redefine definitions to be more consistent with ASTM and USEPA standards (e.g., damping ratio, delay constant, starting threshold, system accuracy, and sigma theta).*
- 2) *Include remote sensing techniques (e.g., Doppler radar, profilers, acoustic sounders, etc.) in both the definitions and in the monitoring sections.*
- 3) *Define specific methods and techniques for the determination of system accuracy.*
- 4) *Because of the recommended increased content of this section, include the more definitive definitions as an appendix to the document.*

## **Section 3    Meteorological Parameters**

- 1) *Remove references to air quality monitoring. ANSI/ANS-2.5 should address nuclear issues only.*
- 2) *Accepted alternate methods of determining site specific atmospheric stability should be given (other than differential temperature and sigma theta). The use of an alternate method for stability should be allowed only if it has been demonstrated to be comparable to the basic differential temperature method or proven superior for a given application.*
- 3) *Address the scalar and vector wind speed/direction processing and the appropriate application of each.*
- 4) *Provide guidance on the meteorological variables that need to be measured for various plant configurations. Specify required verses optional meteorological variables.*

## **Section 4    Siting of Meteorological Instruments**

- 1) *Clarify the criteria and guidelines for the evaluation of obstructions to meteorological sensor exposure. This is especially important for plants with natural draft cooling towers. (Obtaining representative site meteorological observations verses meeting the guideline separation).*
- 2) *Clarify the instrument monitoring requirements for elevated sensors. A 60 meter sensor height should not be mandatory as the upper level should be determined on a case-by-case basis. The upper level measurement height should coincide with the height of release.*
- 3) *Supplemental or satellite meteorological monitoring systems to better define the atmospheric conditions at or around sites should be tied into the purpose/applications of the program (e.g., the estimates of dispersion and transport).*

## **Section 5     Data Presentation**

- 1) *Add data display requirements for the emergency assessments (i.e., frequency, averaging times, and display characteristics for the EOF, TSC, and CR). A hierarchy of alternate sources of meteorological data should be considered for this guidance document.*
- 2) *The issue of requiring dual, independent recording equipment should be revisited due to the improved reliability of state-of-the-art digital recorders. The data recovery rate requirement should be given but the method of accomplishment should be left to the individual utility.*
- 3) *The minimum data collection sampling rate as well as the averaging/summation periods for each variable should be provided.*

## **Section 6     System Performance**

- 1) *Additional guidelines should be provided giving minimum and maximum ranges for each measurement, and minimum recording and/or reduction precision for each meteorological variable for both digital and analog recording systems.*
- 2) *Add a more detailed discussion of data reduction errors including examples.*
- 3) *Improve the system accuracy guidance by adding equations and example calculations in an appendix.*
- 4) *Improve the accuracy presentation, as well as range and precision guidance, by providing the information in a summary table.*
- 5) *Add discussions and guidelines on the types of calibrations and associated content required for the meteorological systems. Include each sensor and associated processing/recording equipment in the calibration discussion.*
- 6) *The parameter accuracies should be reviewed to ensure they reflect the current sensor designs. Where possible, the accuracies should be made less restrictive. Dew-point temperature and precipitation are two examples where less stringent accuracies would not detract from the overall system performance but add to the ease of maintenance and calibration.*

## **Section 7**    *Period of Record, Data Reduction, Compilation, and Storage*

- 1)    *The format of the JFD tables should be presented as a guideline for use. Also, the time periods for JFD compilation should be given as examples and not as specific requirements. The plant specific applications define both the format and time periods.*
- 2)    *The uses and limitations of offsite, supplemental meteorological data for emergency response activities should be addressed.*
- 3)    *The requirement for multiple years of meteorological data for the licensing of a plant appears to no longer be necessary and should be removed from the document. The number of annual cycles of meteorological data needed should be left to plant licensing documents.*
- 4)    *Other guideline documents (e.g., Regulatory Guides 1.111, 1.21, 1.145, etc.) that address the application of meteorological data to nuclear power plant assessments should be at least referenced in ANSI/ANS-2.5.*
- 5)    *Acceptable procedures and techniques for the replacement of meteorological data for various plant application should be included (e.g., dose assessments and site historical records).*
- 6)    *Data validation guidelines and techniques should be included in this document.*
- 7)    *In the archival guidance of site meteorological data, "original recorded form and structure" should be defined.*

## **Section 8**    *Documentation*

- 1)    *The application of the ANSI/ASME NQA-1-1983 quality assurance (QA) program to meteorological data acquisition and processing at nuclear power plants has not been addressed by the NRC. Currently, the need to include the meteorological program under QA requirements has been defined by each individual utility. This issue needs to be addressed and clarified by the NRC and such clarification included in the revised document.*
- 2)    *Clarify the meaning of the "meteorological acquisition program operations period".*



## Section 9    *References*

*ASTM, D5096-90: Standard Test Method for Determining the Performance of a Cup Anemometer or Propeller Anemometer, American Society for Testing and Materials, Philadelphia, PA.*

*ASTM, D4480-93: Standard Test Methods for Measuring Surface Winds by Means of a Wind Vane and Rotating Anemometer, American Society for Testing and Materials, Philadelphia, PA.*

*ASTM, D5366-93: Standard Test Methods for Determining the Performance of a Wind Vane, American Society for Testing and Materials, Philadelphia, PA.*

*USEPA, 1989: Quality Assurance Handbook for Air Pollution Measurement Systems: Vol. IV. Meteorological Measurements, EPA/600/4-90/003, Research Triangle Park, NC.*

*USEPA, 1987: On-Site Meteorological Program Guidance for Regulatory Modeling Applications, EPA/450/4-87/013, Office of Air Planning and Standards, Research Triangle Park, NC.*

*US Department Of Energy, 1991: Environmental Regulatory Guide For Radiological Effluent Monitoring and Environmental Surveillance, (DOE/EH-0173T).*

# *Status Update on ANSI/ANS- 2.5 Revisions*

## ■ *NUMUG April 1994 recommended revisions*

- *General recommendations*
- *Definitions*
- *Meteorological parameters*
- *Siting of meteorological instruments*
- *Data presentations*
- *System performance*
- *Period of record, data reduction, compilation, storage*
- *Documentation*
- *References*

## Exhibit 2

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555



JUL 27 1994

Stanley L. Marsh, Jr., CCM  
NUMUG Steering Committee  
Southern California Edison Co.  
P.O. Box 800  
2244 Walnut Grove Ave.  
Rosemead, CA 91770

Dear Mr. Marsh:

This in response to your letter of April 27, 1994, in reference to a proposed revision of ANSI/ANS-2.5, "American National Standard for Determining Meteorological Information at Nuclear Power Sites." We appreciate your consideration of NRC interest in the standard in your decision whether to commit ANS resources to revise it.

As you are aware, Regulatory Guide 1.23 is the comparable document vis-a-vis ANSI/ANS-2.5. While there have been improvements in the state-of-the-art regarding meteorological monitoring programs during the last 20 years, we are not aware of any safety issues which would suggest that a revision of this Regulatory Guide is in order. If you are aware of any such issues, we would appreciate your calling them to our attention. We appreciate the suggestion that consistency with other standards (e.g., ASTM) and guidance (e.g., EPA), clarifying requirements, and reflecting technological advances are recommended industry goals. As you are aware, regulatory guides are not requirements; they identify methods acceptable to the staff. If found acceptable by the NRC, licensees and applicants can elect to use alternate methods.

We recognize that there may be institutional requirements to revisit ANS standards on a periodic basis. In spite of our position regarding the adequacy of Regulatory Guide 1.23, you should be aware that NRC approval is not needed for ANS to revise the subject standard. We cannot make a commitment at this time to endorse the revised ANSI/ANS-2.5 without a compelling safety argument. Should you proceed with a decision to update the meteorological measurement guidance and technology data base in ANS 2.5, the NRC will determine how to support your activity.

Your interest in these matters is appreciated.

Sincerely,

A handwritten signature in cursive script that reads "Frank J. Congel".

Frank J. Congel, Director  
Division of Radiation Safety  
and Safeguards  
Office of Nuclear Reactor Regulation

# Status Update on ANSI/ANS- 2.5 Revisions

## ■ NRC Response

- “...we are not aware of any safety issues which would suggest that a revision of this Regulatory Guide is in order.”
- “...NRC approval is not needed for ANS to revise the subject standard.”
- “We cannot make a commitment at this time to endorse the revised ANSI/ANS-2.5 without a compelling safety argument.”
- “...the NRC will determine how to support your activity.”

# *Status Update on ANSI/ANS- 2.5 Revisions*

- *Do you and your utility support NUMUG's continued pursuit of a revision to ANSI/ANS-2.5?*

# *Status Update on ANSI/ANS- 2.5 Revisions*

- *Are you and your utility prepared to comply with the requirements of a revised ANSI/ANS-2.5?*

# *Status Update on ANSI/ANS- 2.5 Revisions*

## ■ *Economic considerations*

- *Costs of implementing revisions*
  - *Hardware*
  - *Software*
  - *Documentation*
  - *O&M*

# *Status Update on ANSI/ANS- 2.5 Revisions*

- *Would you serve as a member of a new  
ANSI/ANS-2.5 Subcommittee?*



# Status Update on ANSI/ANS- 2.5 Revisions

## ■ NUMUG volunteers for ANS-2.5 Subcommittee membership

- Mark Abrams - PLG Inc.
- Robert Addis - Savannah River Laboratory
- Tom Bellinger - Illinois Dept. of Nuclear Safety
- Bruce Carson - Pennsylvania Power & Light
- Paul Fransioli - SAIC
- L. Wayne Hamberger - TVA
- R. Brad Harvey - Yankee Atomic
- Ralph Heistand - Florida Power & Light
- David Katz - Climatronics
- Stanley Krivo - ERM Southeast
- Stanley Marsh - Southern California Edison
- Mathew Parker - Westinghouse Savannah River Co.
- Doyle Pittman - TVA
- Gene Shelar - PG&E
- Robert Swanson - Climatological Consulting Corp.
- Ping Wan - Bechtel Power Corp.
- Kenneth Wastrack - TVA
- Robert Yewdall - Public Service Electric & Light

# *Status Update on ANSI/ANS- 2.5 Revisions*

- *Would you serve as the Chair of a new  
ANSI/ANS-2.5 Subcommittee?*

# *Status Update on ANSI/ANS- 2.5 Revisions*

## *■ Milestones*

- Appointment of ANSI/ANS -2.5 Subcommittee Chair*
- Appointment of ANSI/ANS -2.5 Subcommittee Members*
- Convene Subcommittee; technical assignments*
- Compile draft document*
- Review and comment*
- Compile final document*
- ANSI/ANS -2.5 Subcommittee approval*
- NUPPSCO Committee approval*
- Standards Committee approval*
- Nuclear Standards Board approval*
- Submit to USNRC for approval*