

**Nuclear Utility Meteorological Data Users Group**  
**Meteorological Monitoring System Survey**  
**(1997 Edition)**

The Nuclear Utility Meteorological Data Users Group (NUMUG) provides a forum to address problems and exchange ideas among those collecting and using meteorological data at nuclear power plants and facilities. One of the goals of NUMUG is to work towards updating the industry standard for nuclear meteorological measurements. In preparation for this, NUMUG compiled an inventory of nuclear meteorological monitoring programs nationwide and established a comprehensive data base to help focus NUMUG's efforts. NUMUG conducted the original survey during 1992 and released the results at the April 1993 NUMUG meeting in Boston.

A number of factors have indicated that it is now appropriate to update the original survey.

- a. Facilities included in the original survey have made numerous changes. Therefore, it is necessary to update existing information to accurately reflect the current state-of-the-industry.
- b. The original survey was very comprehensive in terms of instrumentation and equipment used for meteorological data collection. However, the survey did not address a number of other important aspects (maintenance and calibration, data processing and archiving, and general administrative issues) concerning meteorological activities. This type of information is helpful in developing a meteorological data collection and processing program.
- c. The original survey did not include several Department of Energy (DOE) sites because they are non-utility facilities. However, these sites conduct meteorological monitoring for many of the same applications as commercial nuclear plants. An expanded data base will provide a useful exchange of information about meteorological monitoring programs to both the utility industry and DOE.

Consequently, a 1997 NUMUG survey is being conducted. This 1997 inventory questionnaire requests most of the information included in the original survey with additional questions about work practices and DOE facilities. The information will be assembled into a composite database and provided to all participating facilities during 1998. In addition, a summary report will be prepared for presentation at the NUMUG meeting in 1999.

Each facility participating in the NUMUG survey should complete the attached blank survey and send it to the following address by October 31, 1997:

Tennessee Valley Authority  
Kenneth G. Wastrack  
CEB 2A  
P.O. Box 1010  
Muscle Shoals, AL 35662-1010

If desired, the blank survey can be made available in electronic form by contacting Mr. Wastrack by phone (205-386-3835) or E-mail (kgwastrack@tva.gov).

*The NUMUG steering committee would like to express our thanks to Stan Marsh and the team that conducted the original NUMUG survey. That survey was an excellent product which made preparation of the second edition of the survey a far easier task.*

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**A. IDENTIFICATION:**

Utility/Organization _____	Contact Person Name _____
Name of Facility _____	Title _____
Location _____	Address _____
_____	_____
_____	_____
Type of Facility (circle):	Telephone Number _____
Power Plant	Fax Number _____
Processing Plant	
Research Facility	E-Mail Address _____
Weapons Facility	
Other _____	

**B. UNIT INFORMATION (Power Plants Only):**

				Number of Units _____
	<u>Size (MW)</u>	<u>Year on Line</u>	<u>Year off Line</u>	<u>Type of Unit (circle)</u>
1	_____	_____	_____	BWR / PWR
2	_____	_____	_____	BWR / PWR
3	_____	_____	_____	BWR / PWR
4	_____	_____	_____	BWR / PWR

**C. SITE CHARACTERISTICS (Circle all that apply):**

Coastal	Inland	Lakefront	Valley	Flat
Rolling	Complex	Urban	Rural	Riverfront

**D. METEOROLOGICAL TOWER INFORMATION:**

			Number of Towers _____
	<u>Tower Height (meters)</u>	<u>[Power Plant only] Distance from Nearest Unit (meters)</u>	<u>Number of Instrumented Levels</u>
Primary Tower	_____	_____	_____
Other Towers	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Notes: Primary Tower is the predominant source of information for a site. Other Towers include all other towers for the site, regardless of function (backup, supplemental, etc.).

In cases where there are more than five (5) towers at a facility, please provide information for typical examples (e.g., towers that best represent conditions or towers whose data are routinely used).

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F. VARIABLES MONITORED:

	Heights of Measurements (meters above surface at tower base)				
	Primary Tower	Other Towers			
Wind Direction	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
Wind Speed	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
Differential Temperature	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
Ambient Temperature	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
Humidity / Dewpoint	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
Precipitation	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
Other (list variables):	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

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G. METEOROLOGICAL INSTRUMENTATION (Use additional sheets as necessary):

<u>Sensor Type</u>	<u>Primary Tower</u>		<u>Other Towers</u>	
	<u>Manufacturer</u>	<u>Model</u>	<u>Manufacturer</u>	<u>Model</u>
Wind Direction	_____	_____	_____	_____
Wind Speed	_____	_____	_____	_____
Differential Temperature	_____	_____	_____	_____
Ambient Temperature	_____	_____	_____	_____
Humidity / Dewpoint	_____	_____	_____	_____
Radiation Shield / Aspirator	_____	_____	_____	_____
Precipitation	_____	_____	_____	_____
Other (list variables):				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Other types of meteorological instrumentation and measurements not listed above (Use additional sheets as necessary):

<u>Instrumentation / Measurement</u>	<u>Manufacturer</u>	<u>Model</u>	<u>Remarks</u>
Human Observer			_____
Automated Surface Observations			_____
Aircraft Soundings			_____
Radiosonde / Rawinsonde	_____	_____	_____
Radar	_____	_____	_____
Lidar	_____	_____	_____
Sodar	_____	_____	_____
Wind Profiler	_____	_____	_____
Other	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

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**H. RECORDING AND AUXILIARY EQUIPMENT:**

Make a new entry for each type of equipment, not for multiple of the same equipment. For example, if three identical Esterline Angus strip-chart recorders are used on a tower, they should be included as a single entry.

	<u>Primary Tower</u>		<u>Other Towers</u>	
	<u>Type *</u>	<u>Manufacturer</u>	<u>Type *</u>	<u>Manufacturer</u>
Analog Recorders	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
Data Logger / Microprocessor	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
Data Transmission to: Control Room (CR) Technical Support Center (TSC) Emergency Operations Facility (EOF)	_____	_____	_____	_____
	_____	_____	_____	_____
Uninterruptible Power Supply	_____	_____	_____	_____
	_____	_____	_____	_____
Backup Power Generator	_____	_____	_____	_____
	_____	_____	_____	_____
Lightning Protection	_____	_____	_____	_____
	_____	_____	_____	_____
Transmitter / Receiver	_____	_____	_____	_____
	_____	_____	_____	_____
Other (additional microprocessors, recorders, etc.) - list	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

\* Examples of Type: Strip-Chart, Single-channel, Multichannel, Data Logger, Microprocessor, etc.

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**I. OFF-SITE DATA SOURCES:**

List offsite meteorological data sources that are used (e.g.; National Weather Service, Radio/TV, University, Internet, weather forecasting service, consultant, etc.).

<u>Offsite Information Source</u>	<u>Distance from site (km)</u>
_____	_____
_____	_____
_____	_____
_____	_____

**J. MAINTENANCE AND CALIBRATION:**

Who predominately performs equipment maintenance (circle)?	Plant Staff	Offsite Staff	Contractor
Who predominately performs calibrations (circle)?	In-House Staff	Contractor	Vendor(s)

Summary of Calibration Practices:

	<u>Calibration Frequency</u>	<u>Type *</u>	<u>Standard(s) **</u>
Wind Direction	_____	_____	_____
Wind Speed	_____	_____	_____
Differential Temperature	_____	_____	_____
Air Temperature	_____	_____	_____
Humidity / Dewpoint	_____	_____	_____
Precipitation	_____	_____	_____
Other sensors (list):	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Data Processing Equipment	_____	_____	_____
Data Transmission Equipment	_____	_____	_____

\* Examples of Type: EXCHANGE = Replace with laboratory-calibrated component.  
 IN PLACE = Apply known inputs without removing from installed location.  
 NONE = Wait for failure and replace.

\*\* Examples of Standards: NIST standard, wind tunnel, factory calibration, torque watch, etc.

Which components result in the most maintenance/calibration and/or data recovery problems?  
 (Use additional sheets as necessary)

<u>Component</u>	<u>Manufacturer</u>	<u>Problem</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

What adjustments are made to raw data (circle all that apply):

no adjustments                      adjust data based on calibrations                      recover data from data recorders  
discard questionable data                      insert data from offsite sources                      Other \_\_\_\_\_

What software are used for data validation (circle)?      Custom-developed      Commercial \_\_\_\_\_

What computer platform is used for data archiving (circle)?

Desktop PC (or equivalent)                      Mainframe                      Other \_\_\_\_\_

What records are handled as quality assurance records (circle)?

Calibrations                      Standards certifications                      Data validation worksheets  
Data results (e.g., JFDs)                      Other \_\_\_\_\_

L. ADMINISTRATION:

NRC NUREG-0654                      DOE Orders (list) \_\_\_\_\_  
ANSI-ANS-2.5                      Other (list specific guidance or regulations) \_\_\_\_\_

[Power Plants Only] Do revisions to meteorological monitoring require 10 CFR 50.59 reviews (i.e., safety assessments)?

Yes                      No                      Explain:

What applications use these meteorological data (circle all that apply)?

Operations                      Dose Assessment                      Emergency Preparedness  
Weather Forecasting                      Dispersion Modeling                      Climatological Records  
Research                      Industrial Safety                      Other \_\_\_\_\_

What types of meteorological support are included in Emergency Preparedness Programs (circle all that apply)?

Emergency teams include meteorologists                      Contractor                      National Weather Service  
Staff are trained in meteorological concepts                      No integral meteorological support                      Other \_\_\_\_\_

List significant upgrades/changes performed in the last three years or expected within the next two years:

M. OTHER COMMENTS / REMARKS / INFORMATION (Use additional sheets as necessary):