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1. INTRODUCTION AND PURPOSES

Most of the presentations at this Twelfth Symposium on Meteorological Observations and Instrumentation will show you a new instrument, system, or network capability with the potential of providing better and faster meteorological information. The primary purpose of this presentation is to convince the meteorological community how our voluntary consensus standards can add credibility and other value to data. A secondary purpose is to entice instrument and system developers, sellers, and users to participate in using, and hopefully creating and maintaining, these standards. Having more people involved in the process could add further credibility to information acquired by the methods and practices in the standards. Another purpose of this presentation is to encourage those purchasing instruments to recognize the economic value of using equipment manufactured to meet the characteristics described in consensus standard test methods.

2. STANDARD ORGANIZATIONS

This paper addresses the meteorological standards associated with three related standards organizations. The longest-standing involvement is with ASTM International (ASTM, previously known as the American Society for Testing and Materials). Although ASTM has primarily operated in the United States, utilization of ASTM standards has spread internationally. The International Standards Organization (ISO) produces meteorological standards as a truly international organization. The American National Standards Institute (ANSI) is the official U.S. representative to ISO, and ANSI accredits the U.S. Technical Advisory Groups (TAG) in ISO. In the ISO Air Quality technical committee, TC/146, the U.S. TAG operates through ASTM.

Voluntary consensus standards in meteorology are written by technical professionals from government, academia, and industry. The committee members develop, build, sell and use equipment covered by the standard practices, guides, and testing methods.

The consensus process involves voting by reviewers to agree on the content of standards. Consensus implies that almost everyone can agree on the standard, which lends credibility to the resulting standards. Compliance with standards is either chosen voluntarily, or may be mandated by a governing regulation for specific purposes. Quoting from the ASTM mission statement, their standards are intended to:

- “promote public health and safety, and the overall quality of life;
- contribute to the reliability of materials, products, systems and services; and
- facilitate national, regional, and international commerce.”

2.1 ASTM Meteorological Standards

ASTM Committee D22 is Sampling and Analysis of Atmospheres; Subcommittee D22.11 is Meteorology. Information on ASTM is readily available on their Internet web site at: www.astm.org. Standards can be purchased through this web site (or phone or mail) individually or in topical book volumes. A small, dedicated group of academic, government, and private sector professionals started the subcommittee to produce meteorological standards on basic meteorological equipment performance and usage more than 20 years ago. The importance of standardization and quality assurance was not widely recognized in the early days of the subcommittee. Much of the credit for the subcommittee weathering the challenges of voluntary scientific activities is owed to the late Thomas J. Lockhart. D22.11 has grown,

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representing a good cross-section of manufacturers, testers, and users.

Subcommittee D22.11 is responsible for twelve standards. Six standards relate to instruments used to measure atmospheric pressure, humidity, wind, and temperature. Four standards address determining the performance of mechanical and acoustic wind sensors. One standard is on the operational comparability of meteorological measurements, and one is a guide on evaluating the performance of atmospheric dispersion models. The model evaluation Standard Guide is a departure from the previously mentioned standards that cover measuring instrument characteristics or providing procedures to measure characteristics of the atmosphere. Recent revisions to the humidity standards provide consensus formulas for vapor pressure that replace pages of tabular listings.

2.2 ISO Meteorological Standards

The meteorology subcommittee in the International Standards Organization is relatively new compared to the ASTM subcommittee. Information on ISO Standards is available on their web site at: www.iso.ch. The United States representatives are also members of the ASTM subcommittee. Through agreements between ISO, ANSI and ASTM, the U.S. holds the Secretariat role for this subcommittee. The Chair of this subcommittee is also from the U.S. At this writing, one standard on acoustic wind and temperature measurement was just published, and one draft standard on air temperature measurement and one on testing anemometers in wind tunnels are moving through the process.

3. USES OF STANDARDS

Within the field of meteorology, standards produce consensus methods of identifying instruments that provide comparable measurements, and ways to utilize the equipment in common practices that provide compatible data. While some meteorological measurements are made for specialized purposes or in extreme environments, many monitoring programs have multiple measurement locations or a long time-series of measurements that should produce compatible information. The standards provide the common language of terms and methods needed for manufacturers to communicate the performance characteristics of their equipment.

Discussions by reputable manufacturers promoting the use of consensus standards and a means of demonstrating truthful compliance with the standards have been on-going for at least ten years. The potential savings in time and effort during the procurement process by utilizing standards provides an added value. The significant discontinuities in recent temperature and humidity data generated by radiosondes supplied by different manufacturers may have been avoided if all suppliers had been held to tighter performance specifications determined by consensus standards.

During recent years, reference to ASTM standards have appeared more than previously in regulatory monitoring guidance produced by the U.S. Environmental Protection Agency and the American Nuclear Society. The ASTM test methods and practices provide a basis for instrument characteristics and measurement techniques from which the monitoring guidance builds with the additional information, such as the quality assurance program, needed for measurements made for specific purposes.

4. CHALLENGE TO INVOLVEMENT

Now that you are convinced that the voluntary consensus standards process is worthwhile to our field of meteorology, my remaining task is to get you involved in this activity. The consensus process works best when all, or at least many, of the manufacturers and equipment users are included.

- Nearly everyone involved in meteorological measurements should be aware of these standards and consider using them as reference tools when procuring equipment and operating measurement programs.
- Some manufacturers and users alike will recognize the value of ensuring that the test methods and practices contain appropriate steps to fulfill their desired purpose. These individuals should consider joining ASTM (or other appropriate organization) and at least becoming a formal reviewer of new and revised standards. Membership information is available on the ASTM web site (www.astm.org); be sure to request joining the D22.11 Subcommittee. The truly hearty ones will then step forward and become a standard writer. And then our whole field will be better for your contribution.