



## Engineering Sciences Section – 2005

### C24 New Standards in Forensic Engineering & Science

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After attending this presentation, attendees will gain knowledge on the current status of standards available to forensic engineers and the need for further standard development to deal with *Frye* standard and *Daubert* challenges.

This presentation will impact the forensic community and/or humanity by demonstrating the use of recognized standards in the practice of forensic engineering, which allows the practitioner's opinions and results to withstand court challenges.

Goals of a forensic engineer/scientist include safeguarding the life, health, property, and welfare of the public, establishing and maintaining a high standard of integrity, skill, and practice in the profession of forensic engineering. The rules of professional conduct for engineers dictate that the forensic engineer shall be completely objective and truthful in all professional reports, statements and testimony. He shall include all relevant and pertinent information in such reports, statements, and testimony. When serving as an expert or technical witness before any court, commission, or any other tribunal, he shall express an opinion only when it is founded upon adequate knowledge of the facts in issue, upon a background of technical competence in the subject matter, and upon honest conviction of the accuracy and propriety of his testimony. These statements or similar ones are generally found in the rules of conduct for engineers in the United States and Canada.

In light of these requirements of conduct, the forensic engineer can ensure that his opinions, reports, and testimony stand on solid ground if they are based on recognized standards. In the last few years, forensic engineers and scientists have been subject to court challenges as to their opinions. These challenges originally stem from a court case in 1923 that established the minimum standard required for the admission of expert testimony in federal cases. The *Frye* Standard, as it has become known, requires the expert to use data and methodology "generally accepted" by other experts. A more recent landmark case is the *Daubert* decision concerning birth defects that were allegedly caused by the mother's use of the anti-nausea drug, Bendectin. The defendant's, Merrill-Dow, motion for summary judgment was granted by the trial court because *Daubert's* experts relied on a technique that the court felt had not received general acceptance within the scientific community. Furthermore, in support of its finding of no general acceptance, the court observed that the proffered findings had not been published or subjected to peer review. The appellate court affirmed the lower court's decision based on the *Frye* Standard. However, the Supreme Court of the United States found that the Federal Rule of Evidence 702, issued in 1975, had superseded the *Frye* Standard and that "general acceptance" was not the *sine qua non* of admissibility. Rather, the Supreme Court stated, any reliable and relevant scientific evidence was admissible. For guidance, the Court then listed some suggested reliability criteria, as follows:

1. Has the theory or technique underlying the proffered evidence been tested and found to have a reasonably low error rate?
2. Has the theory or technique been subject to peer review and publication?
3. Are there recognized standards for applying the theory or technique?
4. Does the theory or technique enjoy general acceptance in the scientific community tantamount to the *Frye* Standard?

The Court emphasized that no one of these criteria needed to be satisfied and that they may not apply to all types of scientific evidence. In any event, all federal courts are now governed by this Supreme Court decision. Many states have also accepted the "*Daubert* Standard," though there are still a sizeable number that have continued to apply the *Frye* Standard and a few that follow neither standard.

Standards in forensic engineering have two main goals: to educate the practitioner and to codify the recognized practice in a particular field. Consensus standards, such as those promulgated by ASTM, ensure that the procedures followed by the investigating engineer follow recognized and well-documented outlines. These procedures aid the investigator by ensuring that pertinent items are addressed, that available evidence has been gathered, and that a scientifically provable hypothesis has been developed and tested. When properly applied, standards and guides are an invaluable aid to the practicing forensic engineer. These guides also place the investigator's opinions on solid foundations with respect to the laws of the land as dictated by the Code of Federal Regulations. Various standards, such as American National Standards Institute (ANSI) Institute of Electrical and Electronic Engineers (IEEE), American Society of Civil Engineers (ASCE), Society of Automotive Engineers (SAE), and many others serve to support the forensic engineer's work and can provide a sound basis for his forensic opinions as well as for having



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those opinions accepted into evidence at trial.

**Forensics, Standard Development, *Frye* Standard**