NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY FIRE DYNAMICS SIMULATOR SOFTWARE SURVIVES *DAUBERT* CHALLENGE IN OHIO

In a recent decision, Turner v. Liberty Mutual Fire Insurance Co., 2007 WL 2713062 (N.D. Ohio)(September 14, 2007); a trial court held that the National Institute of Standards and Technology (NIST) Fire Dynamics Simulator (FDS)(Version 4.0) computer simulation proffered by the defendant's expert satisfied the Daubert reliability test governing expert testimony.

The underlying action arose from a breach of contract and bad faith action filed by the plaintiff against Liberty Mutual Fire Insurance Company for failing to pay insurance proceeds after a house fire. Liberty disclosed its liability expert, who wrote a report based on computer software simulations showing that the fire was incendiary. The plaintiff filed a Motion in Limine attacking Liberty's expert's methodologies.

The court found that Liberty's expert's NIST FDS simulation satisfied the *Daubert* standard governing expert testimony reliability. The Supreme Court established the standard for admissibility of scientific expert testimony under Rule 702 in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). The requirement that "any and all scientific testimony or evidence admitted [be] not only relevant, but reliable," *id.* at 589, "entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." *Id.* at 592-93.

Under *Daubert*, the court provided several (non-exclusive) factors to consider in determining reliability: (1) whether the theory or technique "can be (and has been) "tested"; (2) whether it has been "subjected to peer review and publication"; (3) "the existence and maintenance of standards controlling the technique's operation"; (4) the theory or technique's "known or potential error rate"; and (5) its "general acceptance" in "a relevant scientific community." *Daubert*, 509 U.S. at 593-94.

In *Turner*, the court applied these factors to the motion and found the following. First, the software was tested. FDS is described in NIST Special Publication 1018. The Acknowledgments section of Publication 1018 lists various individuals who have "conducted a number of small and large scale experiments to validate FDS." The court relied on the fact that the NIST FDS software was used to run simulations of the fires at the World Trade Center. The court noted that the September 2005 Computer Simulation of the Fires in the World Trade Center Towers Abstract states, "[T]he model was validated by comparing its predictions with measurements from a series of large scale experiments performed at NIST."

Second, the software was adequately subjected to peer review and publication. The court again relied on Publication 1018's Acknowledgment section containing three pages of peer reviews and contributions, and noted that its bibliography listed 152 sources from which the technical data was drawn.

Third, the software has known error rates for the court to consider. NIST FDS cautions that two components of its calculations--flow velocities and temperatures-- have error rates of 5-20%. However, the court noted that this 5-20% figure doesn't represent an overall error rate and, thus, the matter could appropriately be raised in cross-examination.

Fourth, the *Turner* Court found that Liberty's expert's computer simulation methodology is "generally accepted" by the "relevant scientific community." The court stated that *NFPA 921* is a "recognized guide for assessing the reliability of expert testimony in fire investigations." *NFPA 921* comments on the Computational Fire Dynamics (CFD) model: "The use of CFD models in fire investigation and related litigation, however, is increasing. CFD models are particularly well suited to situations where the space or fuel configuration is irregular ... or where very fine detail is sought."

Moreover, *NFPA 921* confirms the appropriateness of Liberty's expert's application of the model since the court found the defendant's expert compared the results of the simulation to "physical and eyewitness evidence [photographs] to support or refute the hypothesis." The court also stated that perhaps the best evidence of the software's acceptance is its use in three recent nationally-recognized fires: the World Trade Center collapse, the Rhode Island nightclub fire, and the South Carolina sofa store fire.

While this case supports the reliability of expert testimony based on computer simulations run on NIST FDS Version 4.0 software, counsel are reminded that computer simulations actually created by NIST during its own investigations are inadmissible in civil actions. *See* 15 U.S.C. § 281a.