

## Forensic Engineering Ethics and Failures of Infrastructure Facilities

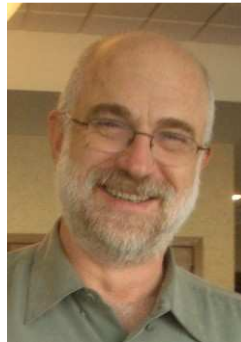
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### Summary

When engineered infrastructure facilities fail, questions regarding the failure, including questions related to responsibility for damages, can be answered in a court of law. Testimony from experts is often presented to aid the court in answering those questions. Rules and laws controlling litigation, and the use of experts, differ from country to country. This paper describes the function of technical expert witnesses in the United States, and examines ethical implications of an expert's participation in the legal system.

Testimony provided by experts retained on behalf of individual sides in a dispute is contrasted with testimony of an expert retained directly by the court or by the presiding judge, as may be the practice in some situations in US courts, and in the legal systems of countries other than the US.

Expert testimony relating to a real infrastructure failure is examined to illustrate these two points of the paper: 1) it is ethically acceptable for an expert to provide testimony in support of one side of a dispute, and 2) experts retained directly by the court may not be in the best interest of justice where there is not a guaranteed absence of bias.

**Keywords:** Failure of engineered infrastructure, litigation, forensic engineering, ethics, expert testimony.

### 1. Introduction

In an ideal world, engineered infrastructure facilities always perform as intended. In the real world, however, some engineered infrastructure facilities fail to achieve that desired level of performance. In the US legal system, the cause of the failure and the responsibility for damages arising from the failure may be determined in a court of law with the assistance of forensic engineers and scientists who serve as “expert witnesses.”

The purpose and use of expert witnesses in the US legal system, where each litigant retains its own experts to present technical evidence in support of its particular position, is defined in the Federal Rules of Evidence [1]. Experts may face dilemmas in providing litigation support services to their legal client, including the assumption of objectivity while at the same time serving in support of one side in the litigation—the side that retained the expert. The expert's ethical dilemma in this adversarial system doesn't vanish in an alternate system where the technical expert is retained by the court itself, independent of any litigant. In fact, it may be that the best interests of all sides in a dispute, and justice itself, is better served when each side is able to present its own experts, testifying regarding the technical aspects of the dispute from the point of view of the side which retained them.

The litigation record from a recent catastrophic infrastructure failure, the flooding of New Orleans during Hurricane Katrina, provides an example of contrasting expert testimony. Publicly available records of the court decision and testimony of experts on opposing sides in that litigation are examined to illustrate the idea that ethical engineering services do not necessarily exclude advocacy, and that an expert retained by the court, rather than by a particular side in a dispute, may not be immune from bias contrary to the interest of justice.