

# ACCIDENT RECONSTRUCTION

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This paper will express the concern of the National Academy of Forensic Engineers (NAFE)® with regard to the practice of what has loosely been called "Accident Reconstruction." The terminology is typically used in reference to the analysis, reporting and exposition of opinions in the legal system, including testimony in depositions and in court relative to accidents which have occurred in the highway environment. In most instances the on site investigation has been accomplished by police officers, some of whom may have received supplemental training for this purpose. It is desirable that an engineer who analyzes the event and ultimately reports and may testify, giving an opinion as to the engineering analysis, or "reconstruction," have access to the site and to any vehicles involved at the earliest possible time. Competent first instance investigation, including photography and measurements by police at the site is very important toward the goal, in the public interest, of detailed engineering analysis of the accident. The NAFE encourages and supports the training of police for this important duty.

However, despite the best of intentions and the benefit of correspondence courses or classroom instruction (typically a few weeks in duration) the investigation of accidents by police investigators is often seriously lacking in details which would provide foundation for engineering, scientific and mathematical analysis. The courses given to police personnel "on campus" at several universities are very limited in scientific and mathematical instruction and are not college accredited courses even at the (associate) "community college" level. These limitations in police training may have a restrictive effect on the usefulness of the information recorded. Even more significantly, the limitations in training make it unlikely that the trainee can be expected to make reliable and competent analysis of any except the most simple of accidents. The NAFE has had advice from numerous of its members of the erroneous application of basic science and mathematical principles by "graduates" of such courses including in particular the determination of

vehicle speed at and prior to impact using methodologies taught at such courses and included in the publications associated with such. The persistent and continuing use of "side-slip" speed analysis by "Certified Accident Reconstructionists" and their defense of same in spite of demonstrable mathematic deficiency is a grave public disservice. Similarly, the persistent and continuing use of "drag-tire/drag sled" determinations of skid friction factors totally ignores the realities of dynamic material characteristics which occur in stopping sequences. NAFE members also recount instances of "Certified Accident Reconstructionists" providing technical sounding reports and even testimony under oath on matters involving civil and highway engineering, mechanical, electrical and materials engineering where the "reconstructionist" has little or no education or experience in these complex fields. We note that there is no requirement for a degree (not even at high school level, much less in an accredited engineering curriculum) as a condition for designation as a "Certified Accident Reconstructionist." Apparently, only the passage of a simple test involving no more than high school level knowledge is the criteria for attainment of this credential. The NAFE, therefore, strongly urges that the courts view cautiously the acceptance of the "Certified Accident Reconstructionist" title as an index of qualifications to testify with respect to the analysis of accidents. The issuance of a "certification" by "accident reconstruction" organizations as based on written examinations of limited scope does not indicate a degree of qualification inclusive of an understanding of even the primary principles of mathematics and science which are required of all engineers in their undergraduate studies.

The NAFE also has increasing concern relative to the efforts of some organizations of "accident reconstructionists" seeking by political and legislative means to restrict the investigation analysis, reporting and expression of expert opinions with respect to accidents to persons of their kind who have received the "certification" sanction of their own organizations. Such efforts are obviously self-serving for business purposes only, and do not serve the interest of the public. Moreover such efforts presume to block the practice of Professional Engineering which in all states and in the "Model Law" for Professional Engineering practice of the National Council of

Examiners for Engineering and Surveying (NCEES) is inclusive of "investigation, evaluation, consultation and expert technical testimony" on engineering matters.

While NAFE welcomes the role of police officers and encourages their further training in their proper role as investigators and fact witnesses, it will, in concert with the national and state societies which represent licensed professional engineers necessarily resist efforts of accident reconstruction groups to limit the practice of Professional Engineering. Efforts of police based groups to carve out an exclusive domain may well serve the economic interest of the proponents but do not serve the public interest since the certificants empowered by such groups have a very limited education compared to licensed professional engineers as it may be applicable to the physical analysis of accident crash dynamics. A licensed MD physician is not required to achieve an EMT certificate as a condition of practice in emergency medicine. The EMT is not to be put in the same category as the MD with respect to medical knowledge, nor is the certified accident reconstructionist to be put in the same category as the licensed professional engineer, nor is the state licensed professional engineer to be required to submit to accident reconstruction groups for permission to practice what in essence is a subsegment of professional engineering. At whatever level it is taken there are different degrees of qualification which public officials and the courts should consider with respect to acceptability of testimony.

The U.S. Court of Appeals for the Fifth Circuit (in Wilson vs. Woods et al) recently affirmed the decision of the U.S. District Court for the Southern District of Mississippi denying acceptance in a highway accident case of testimony by an accident reconstructionist.

The trial court stated in its decision:

*"The Court is concerned, as it has been directed to be concerned, by Daubert and its progeny, about the proliferation of so-called expert witnesses. This court personally is not convinced that there is any such thing as an accident reconstruction-*

*ist as an expert field under the rules and guidelines set forth by the Supreme Court in Daubert."*

*"None of the people who seem to be testifying have published in the field, have done experimentation in the field; and other than getting a correspondence course from this Northwestern Traffic Institute, which pads the resume, none seems to have anything other than in most instances, a general scientific background."*

Also, the Federal Court continued:

*"I have never, at this state, allowed, over objection, anyone to testify as an accident reconstructionist... I don't know that there is such a thing other than some professional hired guns who go around and claim to be accident reconstructionists."*

In an Amicus Curiae brief submitted by the National Academy of Forensic Engineers (NAFE) to the United States Supreme Court in the matter of Kumho Tire Co. vs. Carmichael which was recently decided in an interpretation and extension of the Supreme Court's earlier decision in the matter of Daubert vs Merrell Dow Pharmaceuticals Inc., the NAFE emphasized and supported the role of the trial court (judges) as gatekeepers to determine the admissibility of testimony by experts. This is particularly significant with respect to the admission of testimony by police investigative persons of limited background with respect to the analysis ("accident reconstruction") of highway related events. The further efforts of those having certifications as "accident reconstructionists" to mandate control or require the sanction by such persons of the investigation of all accidents simply becomes bizarre when it progresses into industrial accidents, structural defects, building failures, environmental violations, etc.

The NAFE supports and encourages competent police investigative efforts. However, the presumption that police investigators have competence to enter into or restrict the domain of the practice of professional engineering is ill-conceived and does not serve the public.

The National Academy of Forensic Engineers (NAFE) is a not-for-profit (501.c.6) membership organization requiring a professional engineer's license and extensive engineering experience including engineering experience in the courts, together with recommendations of attorneys as a prerequisite for NAFE membership. The typical NAFE member is about 30 years past P.E. licensure. That license is only attained after passing a demanding 16 hours of written examinations subsequent to acquiring 4-5 years of acceptable engineering experience which follows at least 4 years of full time engineering study leading to a bachelor degree in an accredited university engineering curriculum. About half of NAFE members have gone further and attained a Master's degree and about one third of those have attained the doctoral degree in engineering. All NAFE members are required to maintain professional competence by continuing professional education. The NAFE is formally affiliated with the National Society of Professional Engineers (NSPE) and with the Council of Engineering and Scientific Specialty Boards (CESB) and is empowered by CESB to certify the members of NAFE as "Diplomate Forensic Engineers." The CESB is patterned after the American Board of Medical Specialties (ABMS) and is sponsored by the major interdisciplinary engineering organizations including those which accredit the engineering curricula in the universities of the United States and the examining boards for State Professional Engineering licensure.

**Approved by the Board of Directors of the National Academy of Forensic Engineers  
(NAFE) on July 30, 2000.**