**Chapter 14    Reconstruction Experts**
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## This chapter was published in

## PROVING FAULT IN AUTO ACCIDENT CASES (IICLE, 2007)

# 14 Reconstruction Experts

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**X. New Directions in the Law of Accident Reconstruction Experts**

## X. NEW DIRECTIONS IN THE LAW OF ACCIDENT RECONSTRUCTION EXPERTS

### A. [14.19] Computer Animation and Video Evidence

As the use of computer animation and video evidence in accident reconstruction expert testimony has become more prevalent, the law has strived to keep pace. When such evidence is demonstrative in nature, courts are likely to approve its use. In *Datskow v. Teldyne Continental Motors Aircraft Products,* 826 F.Supp. 677 (W.D.N.Y. 1993), for example, the district court permitted the plaintiff's reconstruction expert to use videotaped experiments as demonstrative evidence in an airplane crash product liability suit, accompanied by a cautionary jury instruction, when the video was not intended to replicate the actual occurrence but merely to serve as an illustration. In *Robinson v. Missouri Pacific R.R.,* 16 F.3d 1083 (10th Cir. 1994), the Tenth Circuit upheld the use of a video animation of an automobile-train collision to illustrate the plaintiff's reconstruction expert's theory that, contrary to the defendant's contention, the plaintiff had not attempted to drive around the gates and onto the train track but rather that the gates had never been raised; here, again, the court emphasized that the video animation was demonstrative evidence and that a limiting instruction had appropriately been employed. *See also Clark v. Cantrell,* 332 S.C. 433, 504 S.E.2d 605 (1998); *Rockwell Graphics Systems, Inc. v. DEV Industries, Inc.,* No. 84 C 6746, 1992 U.S.Dist. LEXIS 16938 (N.D.Ill. Nov. 3, 1992); *Marshall v. Taylor-Wharton Co.,* 234 Ill.App.3d 596, 599 N.E.2d 1015, 175 Ill.Dec. 1 (1st Dist. 1992).

Illinois courts similarly have applied these principles, as exemplified by the ruling in *Barth v. International Harvester Co.,* 160 Ill.App.3d 1072, 513 N.E.2d 1088, 112 Ill.Dec. 479 (1st Dist. 1987). In *Barth,* the First District affirmed the trial court's decision to admit in evidence the defendant's videotape of a tractor identical in make, model, and design to the tractor involved in the occurrence. The plaintiff's counsel never objected to the demonstration and was permitted to cross-examine the individual who drove the tractor in the videotape. The court held that the videotape was not a reenactment of the occurrence, in which the tractor overturned, but rather a demonstration of the tractor's turning ability to illustrate that the tractor could turn a corner safely under normal operating speeds and conditions. The court held that the defendant was not required to make a showing of substantial similarity between the conditions in the videotape and those at the time of the occurrence.

As set forth by the court in *Galindo v. Riddell, Inc.,* 107 Ill.App.3d 139, 437 N.E.2d 376, 381, 62 Ill.Dec. 849 (3d Dist. 1982):

> **In general, experiments are incompetent as evidence unless the essential conditions of the experiment are shown to be the same as those existing at the time of the accident. . . . However, when an experiment is not represented to be a reenactment of the accident and it deals with one aspect or principle directly related to the cause or result of the occurrence, the exact conditions of the accident need not be duplicated. [**Citations omitted.**] Citing *Ryan v. Blakey,* 71 Ill.App.3d 339, 389 N.E.2d 604, 27 Ill.Dec. 540 (5th Dist. 1979), *Skalon v. Manning, Maxwell & Moore, Inc.,* 127 Ill.App.2d 145, 262 N.E.2d 146 (1st Dist. 1970), and *Johnson v. Chicago & North Western Ry.,* 9 Ill.App.2d 340, 132 N.E.2d 678 (2d Dist. 1956).

The *Galindo* court ruled that neither the defendant's experiment nor the plaintiff's proposed experiment with the type of football helmet at issue was intended to be a re-creation of the occurrence. Therefore, the defendant's experiment was properly admitted into evidence, and the plaintiff's experiment likewise should have been. *Accord Brennan v. Wisconsin Central, Ltd.,* 227 Ill.App.3d 1070, 591 N.E.2d 494, 169 Ill.Dec. 321 (2d Dist. 1992); *Rios v. Navistar International Transportation Corp.,* 200 Ill.App.3d 526, 558 N.E.2d 252, 146 Ill.Dec. 289 (1st Dist. 1990). "Whether the experiment evidence meets the criteria for admission is a determination left to the sound discretion of the trial judge, whose decision will not be overturned absent a clear abuse of discretion." *Rios, supra,* 558 N.E.2d at 258.

In *Glassman v. St. Joseph Hospital,* 259 Ill.App.3d 730, 631 N.E.2d 1186, 197 Ill.Dec. 727 (1st Dist. 1994), the appellate court approved the showing of a videotape of a coronary bypass procedure, similar to the procedure at issue in the case, performed on a different patient by different physicians. The court ruled: "Videotapes may be shown if 'their probative value is not outweighed by their inflammatory effect.'" The court held that the video was instructional in explaining the surgical procedure to the jury. 631 N.E.2d at 1204.

Similarly, in *Dillon v. Evanston Hospital,* 199 Ill.2d 438, 771 N.E.2d 357, 264 Ill.Dec. 653 (2002), the Supreme Court of Illinois ruled that the trial court properly admitted a videotaped animation of endocarditis as demonstrative evidence in the case. A board-certified doctor specializing in infectious diseases testified "that the video animation would be helpful in explaining to the jury the general development of endocarditis, a condition for which plaintiff is now at risk." 771 N.E.2d at 364.

In contrast, video and computer animation evidence that attempts to re-create the occurrence must satisfy the same strict standard as other experimental evidence; *i.e.,* the essential conditions of the evidence must be substantially similar to those that existed at the time of the occurrence. *Hinkle v. City of Clarksburg, West Virginia,* 81 F.3d 416 (4th Cir. 1996) (computer animation of motor vehicle collision); *DiRosario v. Havens,* 196 Cal.App.3d 1224, 242 Cal.Rptr. 423 (1987); *Gladhill v. General Motors Corp.,* 743 F.2d 1049 (4th Cir. 1984). Courts will permit the introduction of such evidence only after first determining that it is relevant and reliable, it will not result in undue prejudice, and a proper foundation for the evidence has been laid. *Hinkle, supra. See, e.g., Ford v. City of Chicago,* 132 Ill.App.3d 408, 476 N.E.2d 1232, 87 Ill.Dec. 240 (1st Dist. 1985).

In *Brown v. Ford Motor Co.,* 306 Ill.App.3d 314, 714 N.E.2d 556, 239 Ill.Dec. 637 (1st Dist. 1999), the appellate court held that it was appropriate to show accident reconstruction videos and federal certification testing videos to the jury in slow motion. A videotape is admissible to help the jury understand a witness' testimony "if it fairly and accurately shows whatever it intends to show and if it is not unduly prejudicial." 714 N.E.2d at 559, quoting *Barry v. Owens-Corning Fiberglas Corp,* 282 Ill.App.3d 199, 668 N.E.2d 8, 10, 217 Ill.Dec. 823 (1st Dist. 1996). It was explained to the jury that the federal certification videos were made to meet with federal testing requirements; additionally, the fact that the videos were in slow motion rather than real time did not make them unduly prejudicial.

In *Spryka v. County of Cook,* 366 Ill.App.3d 156, 851 N.E.2d 800, 303 Ill.Dec. 613 (1st Dist. 2006), a medical negligence case alleging that the defendants discontinued Heparin, thereby causing their patient's death, the appellate court ruled that a video animation was not admissible since it was not demonstrative in nature. The video showed an animation of a pulmonary embolism being formed and a deep vein thrombosis traveling to the heart. First, the appellate

court ruled that the plaintiff's disclosure of the animation was untimely since the plaintiff did not disclose it until the same day as opening statements and was unable to show the animation to defense counsel or the trial judge until three days later.

Regarding the substance of the animation, the *Spryka* court ruled: "Before a film can become evidence at trial: (1) a foundation must be laid, by someone having personal knowledge of the filmed subject, that the film is an accurate portrayal of what it purports to show; and (2) the film's probative value cannot be substantially outweighed by the danger of unfair prejudice." 851 N.E.2d at 810. The court found that the animation was not intended to help explain the general mechanism of a pulmonary embolism or the general effects of Heparin but, rather, to show "in a step-by-step fashion" what happened to the plaintiff's decedent in that particular case. *Id.* Yet the plaintiff's expert admitted that he could not say that the animation showed what actually happened to the patient in this case. The court found that the animation made no attempt to account for the testimony of the defendants' experts that the clots did not form during the period after Heparin was stopped. The court ruled that the animation "would tend to precondition the minds of the jurors to accept the plaintiff's theory." 851 N.E.2d at 811. The court concluded that it was reversible error for the trial court to have permitted the showing of the videotape.

See generally Fred Galves, *Where the Not-So-Wild Things Are: Computers in the Courtroom, the Federal Rules of Evidence, and the Need for Institutional Reform and More Judicial Acceptance,* 13 Harv.J.L. & Tech. 161 (2000); Dean M. Harts, *Reel to Real: Should You Believe What You See?,* 66 Def.Couns.J. 514 (1999); Mark C. Joyce, *Using Computer Animations,* 11 Aug.S.C.Law. 32 (July/Aug. 1999); Joseph J. Ortego, *Reconstructions, Reenactments, and Demonstrations* (July 1, 1999) (available at www.nixonpeabody.com/publications_detail3.asp?id=58); James E. Carbine and Lynn McClain, *Proposed Model Rules Governing the Admissibility of Computer-Generated Evidence,* 15 Santa Clara Computer & High Tech.L.J. 1 (1999); Kristin L. Fulcher, *The Jury as Witness: Forensic Computer Animation Transports Jurors to the Scene of a Crime or Automobile Accident,* 22 U. Dayton L.Rev. 55 (1996); Edward A. Hannan, *Computer-Generated Evidence: Testing the Envelope,* 63 Def.Couns.J. 353 (1996); James T. Clancy, Jr., *Computer Generated Accident Reenactments: The Case for Their Admissibility and Use,* 15 Rev.Litig. 203 (1996); Evelyn D. Kousoubris, *Computer Animation: Creativity in the Courtroom,* 14 Temp.Envtl.L. & Tech.J. 257 (1995); Adam T. Berkoff, *Computer Simulations in Litigation: Are Television Generation Jurors Being Misled?,* 77 Marq.L.Rev. 829 (1994); J. Stratton Shartel, *Computer Animation Often Provides Winning Edge for Litigators,* 7 Inside Litig., No. 5, 1 (May 1993); Vicki S. Menard, *Admission of Computer Generated Visual Evidence: Should There Be Clear Standards?,* 6 Software L.J. 325 (1993).

## B. [14.20]  Computer-Generated Data

The courts will accept testimony of accident reconstruction experts based on computer-generated data. In *Turner v. Williams,* 326 Ill.App.3d 541, 762 N.E.2d 70, 260 Ill.Dec. 804 (2d Dist. 2001), the court ruled that the trial court had abused its discretion in excluding the testimony of the defendants' accident reconstruction expert on the grounds that the computer-generated data used in formulating the expert's opinions did not meet the standard set forth in *Frye v. United States,* 293 F. 1013 (D.C.Cir. 1923). The Second District Court held that the reliability of the computer programs used by the accident reconstruction expert was not a *Frye* issue since the *Frye*

test is used for "novel scientific evidence with no prior history or reliability," which did not apply to the long-time use of accident reconstruction testimony. 762 N.E.2d at 82. In the case at bar, the reconstruction expert testified that the computer programs he was using, EDCRASH and EDSMAC4, were "widely used and accepted in the field of crash analysis." *Id.*

The *Turner* court held that the defendants' failure to disclose in their answers to Supreme Court Rule 213 interrogatories that the reconstruction expert's computer programs were reliable and widely used and accepted in the field of accident reconstruction did not warrant the exclusion of the expert's testimony. The court ruled that "[a]ny issue plaintiffs had concerning the testimony of [the reconstruction expert] and the *Frye* standard should have been addressed in a *Frye* hearing prior to trial." *Id.* The court found that S.Ct. Rule 213 does *not* require the disclosure of testimony that would have been elicited had a *Frye* hearing been conducted. The appellate court also found that the expert's failure to use or input in his computer programs certain deposition testimony or other information, such as the color of the traffic lights, was not a sufficient basis to bar his testimony but, rather, was an issue for cross-examination.

## C.  [14.21]   Electronic Control Modules (ECMs) or "Black Boxes"

Motor vehicles, and especially semi and double tractor-trailers, are increasingly being outfitted with devices called "electronic control modules" (ECMs) or "black boxes." ECMs control every major function of the vehicle, including acceleration, braking, oil pressure regulation, and fuel injection. Their significance in the context of accident reconstruction testimony is that they serve a dual function as recorders of the vehicle's speed, RPMs, braking, and often other important data as well, usually in regular increments of time (*i.e.,* seconds and minutes). This information is typically stored in a computer or disc medium and must be extracted or downloaded into readable form.

The data that may be derived from the ECM is seemingly infinite and includes whether the driver of the vehicle applied the brakes prior to the collision, when the brakes were first applied and how hard, the speed of the vehicle, engine speed, throttle position, whether and when the clutch was engaged, gear changes, and the time of impact. If the vehicle is equipped with hard-braking or quick-stop occurrence data recording, the ECM should yield data for the minute prior to the collision in intervals of one second, enabling the determination of the vehicle's pre-impact speed. Careful analysis of this data by the accident reconstruction expert can reveal a host of information about the driver's action or inaction prior to the collision.

It is critical for the practitioner to obtain the data from the vehicle's ECM in its complete form as early as possible in the litigation. Obtaining the wealth of information that may be derived from this recording device will enable the practitioner to direct the case in light of this enhanced knowledge, aiding in issuing written discovery, taking the depositions of the drivers, preparing experts for deposition, and deposing the opposing side's experts.

In *Bachman v. General Motors Corp.,* 332 Ill.App.3d 760, 776 N.E.2d 262, 267 Ill.Dec. 125 (4th Dist. 2002), the appellate court found that the data mined from a car's ECM was sufficiently reliable to be admissible and to serve as the basis for the testimony of an accident reconstruction expert. In *Bachman,* the plaintiffs alleged that their car's air bag inadvertently deployed

prematurely, causing the collision, because the sensing and diagnostic module (SDM or SDM-R, the air bag crash sensor) was hypersensitive to road surfaces and objects striking the car's floor pan. The plaintiffs argued that the trial court erred by allowing evidence of data downloaded from the car's SDM.

After conducting a *Frye* hearing at the defendant's request, the trial court found the SDM data to be adequately trustworthy. The appellate court quoted the trial court's findings that "[c]omputer data, in general, and it is the computer information being recorded, in the court's mind[,] is not novel. It is an accepted fact of society. We have floppy disks, tape backups, Zip drives used by individuals and businesses alike to record and capture data. . . . The microprocessor used in the SDM-R in this case is used in many consumer products and is a standard part used in various vehicle control systems, including engine controls, anti-lock brakes, suspension controls and air bags. It is only the admissibility, under the *Frye* test, of the SDM-R data which could be, in the court's opinion, conceived as novel." 776 N.E.2d at 281.

The appellate court agreed with the trial court that "the process of recording and downloading SDM data does not appear to constitute a novel technique or method. . . . Crash sensors such as the SDM have been in production in automobiles for over a decade, and the microprocessors that run them and record their data also run everyday appliances, such as computers and televisions." *Id.* In reviewing the record before it under the *Frye* test, the appellate court held that "the trial court did not abuse its discretion by (1) finding that the process of recording and downloading SDM data is sufficiently established to have gained general acceptance in the relevant scientific community, and, thus, (2) determining that the *Frye* admissibility standard had been satisfied." 776 N.E.2d at 283. Therefore, the trial court did not err in allowing the SDM data and opinion testimony based on the data to be admitted in evidence.

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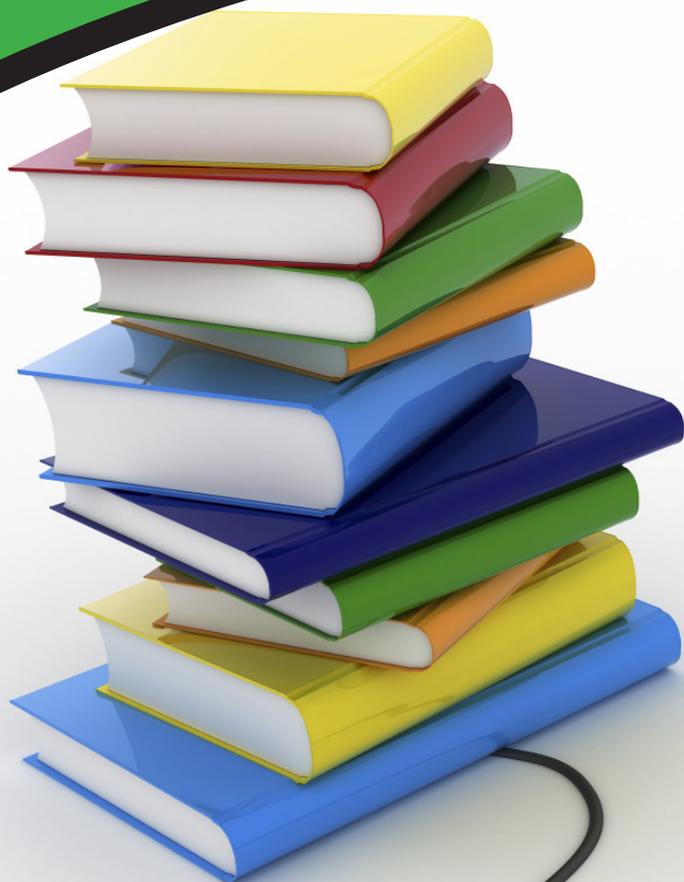
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