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## **Simplifying Through Storytelling: Use of Animations and Graphics in Complex Product Liability Claims**

### **I. Introduction**

Significant advancements have been made in recent years in mathematical modeling and computational processing contributing to computer simulations, graphics, visualization, and animations. These technologies bring to life complex concepts and dynamics that are otherwise difficult to analyze, describe, and demonstrate. Modeling and simulation can analyze alternative scenarios and the influence of selected materials and variables on an outcome. Animations and visualizations permit privileged views of time, space, and scale. The applications of such technology include teaching, research, and multi-media presentations to the public in various venues. One of these venues is in our legal system where litigators and scientific experts are employing simulations, animations, and visualizations to present facts, opinions, and theories. These techniques can allow a jury to watch a recreation of a crucial event: they can place the jury in the driver's seat of an automobile involved in a collision or in the cockpit of an airplane about to crash. They can demonstrate the outcome of an event at alternative speeds or with alternative component interaction such as seat belt restraint. They can demonstrate the design or function of an internal mechanical component or anatomical structure that cannot otherwise be seen with the naked eye. A long-duration process that normally occurs over periods of months or a short-duration process that occurs in milliseconds can be shown over a controlled time period for efficient discussion and effective understanding.

One of the challenges in product liability claims is how to explain the complex design and/or manufacturing process of a product to a judge or jury (or even a plaintiff) in a way that can be understood simply, quickly and unambiguously.

Simulations, animations, and visualizations that effectively "tell the story" of a product can greatly impact case outcomes both in pre-trial negotiations and in trial.

## **II. Types of Animations**

There are three basic categories of animations: the tutorial, the illustration, and the simulation (some animations combine features of all three).

### **A. The Tutorial**

#### **1. What is a tutorial?**

It is an educational tool used to explain a complicated scientific concept, such as principles of anatomy or physics, or a tutorial may be used to demonstrate how a complex piece of machinery operates.

#### **2. Admissibility**

The tutorial is a form of demonstrative evidence and general principles involving the use of demonstrative evidence apply. Demonstrative evidence includes articles or “things” brought into court, as distinguished from the assertions of witnesses about things. Demonstrative evidence has no probative force beyond that provided by the testimony which it illustrates.

All jurisdictions allow the use of demonstrative evidence such as maps, models, and duplicates to illustrate and explain oral testimony.

An animation which is a tutorial should be admitted with little difficulty if it is relevant and if it is authenticated by an expert. In many cases, admissibility will be aided by the fact that the principle or operation in question is simply not in dispute.

### **B. The Illustration**

#### **1. What is an illustration?**

The illustration is used to visually depict an opinion testified to by an expert or facts presented by law witnesses. The animator essentially uses the graphic capabilities of the computer as a canvas on which to “draw” an illustration of factual or opinion testimony in regard to how an event happened.

#### **2. Admissibility**

Like the tutorial, the illustration is another form of demonstrative evidence. An animation used to illustrate testimony should be only slightly more difficult to admit than a tutorial. The illustration is simply a visual aid, like a chart or a diagram, and should be admitted on the same basis as those types of demonstrative evidence.

## **C. The Simulation**

### **1. What is a simulation?**

The animated simulation combines the computer's capabilities for animation as well as computation. A computer simulation uses a finite element program, essentially a mathematical model, to simulate complex real world problems. Simulations are commonly used in the automobile, aerospace, construction, military, manufacturing, and bioengineering industries. In an aerospace application an engineer might simulate a bird strike on a windshield or structural failure. In automotive applications a simulation might be used to predict a car's behavior in a collision and the effects of the collision upon the car's occupants. In a biomedical engineering application a prosthetic material or valve implant might be simulated to assess their anatomical placement or model stresses and failure. Sports equipment design can be simulated for performance and impact force mitigation. Many of these same questions can arise in litigation. In addition, a simulation may be used to present alternative scenarios such as if a different material had been utilized in a design, a different travel speed of a car, or the movement of a body during a collision if a seat belt had been worn. When opinion testimony is involved, a computer-generated illustration is drawn from an expert's opinion, but with a computer-generated simulation, the expert's opinion is drawn from or confirmed by the simulation.

### **2. Admissibility**

A simulation may be offered to supply missing elements of an event which were calculated by a computer, such as the speed of an automobile involved in a collision. In addition, simulations are sometimes offered to independently confirm an expert's already formed opinion.

Because a computer simulation program actually makes calculations and supplies missing data, the standards for admissibility and the type of authentication required will necessarily be greater than those involved with an illustration. Because the simulation is more than just an illustration of testimony, it is not simply demonstrative, but also substantive evidence. The proponent will have to "qualify" the computer-generated simulation in a manner similar to qualifying an expert witness.

With the increased use of simulations in recent years, the objections to their use have become more specific, and the proponent of a simulation must be prepared to overcome each of those objections.

As with an animation that is a tutorial or an illustration, the proponent of a simulation will have to show that the animation is relevant and that it will assist the trier of fact.

If the simulation recreates the crucial event upon which a lawsuit is based, and the simulation takes into account all crucial factors present when an accident occurred, then the simulation should be considered relevant.

The simulation must be shown to be a fair and accurate reconstruction of the event in question. Evidence may be authenticated by the testimony of a witness with personal knowledge of facts that are sufficient to authenticate the evidence. It will thus be necessary to establish the credentials of the engineer/scientist, to validate the computer software and the application of the software to this specific question, to show the source and accuracy of the input data, to verify the accuracy of the mathematical calculations, and to demonstrate the accuracy of the media used to present the simulation.

The engineer/scientist should have adequate credentials and experience to be able to testify about the accuracy of the simulation and its applications. The computer hardware should be commercially available and accepted by experts in engineering or accident reconstruction.

If the software is custom designed, then testimony regarding its accuracy may be presented in two ways. First, the programmer could testify, but that may raise problems if the programmer was unavailable. Alternatively, a person familiar with the use of the program, its operation, and its results could testify as to the software's reliability.

In order to authenticate the input data, the proponent of an simulation should be able to show the source and accuracy of the data that was input. At this point, the familiar computer axiom "Garbage in, garbage out" applies. The proponent should also be prepared to overcome hearsay objections to the data.

Because a simulation is offered as substantive (not just demonstrative) evidence, it is offered to provide the truth of the matter asserted, and is, therefore, subject to the hearsay rule. It could, however, be argued that computer simulations are analogous to expert testimony.

If an expert, such as an accident reconstructionist, testified that the underlying data is the type reasonably relied upon by experts in the field, then the hearsay problem may be avoided. In addition, the input data will often fall within exceptions to the hearsay rule, such as the business records exception.

The proponent of the simulation should also be able to show the accuracy of the simulation by demonstrating that the simulation was checked by a validation exercise or benchmark tests.

The simulation program should contain verification procedures and safeguards to eliminate errors at each step in the processing.

Finally the proponent of a simulation should be able to show the accuracy of the presentation media by presenting testimony that there is minimal distortion in the videotaping process.

### **III. Other Effective Demonstrative Aids**

#### **A. Other Effective Demonstrative Aids may include 3D Printed Models, objects videos and Graphics**

There are many creative ways to effectively communicate complex messages to a jury in product liability cases. It is critical to communicate with your expert and think “outside the box” about what tools would be most effective in a given product liability case. For example, if trial counsel and an expert are trying to communicate to a jury how the human body moved in a motor vehicle, it may be effective to use a skeleton to visually demonstrate for the jurors the different injuries sustained, what movements were required for those injuries to be sustained, and what that means for the case/defense (i.e. a seatbelt defense). If trial counsel and an expert are trying to communicate to a jury how many miles a tire traveled during its lifetime, they may want to make a video that shows the number of miles that tire traveled and how that mileage compares to taking a trip across the country, or multiple trips across the country, or even laps around the globe.

#### **B. Admissibility**

Like the tutorial and the illustration these would likely be considered another form of demonstrative evidence.

### **IV. Different Perspectives**

The client, the expert and the trial counsel may have different perspectives on when certain tools should be used and created such as:

#### **A. Client’s Perspective**

A client may be concerned with the cost associated with creating these tools and that concern may impact the timing of when these tools are created.

#### **B. Expert’s Perspective**

The expert’s perspective may focus on when he/she will be able to use these tools throughout the litigation and how to best communicate their opinions.

#### **C. Trial Counsel’s Perspective**

In addition to considering the cost, the timing, and the effectiveness of creating these tools, trial counsel will be concerned with the admissibility of same.

The decision to use the above-mentioned tools should be a group effort and in making decisions concerning the timing, the cost, the effectiveness, and the admissibility of any given tool, the following should be considered:

- Counsel should take all precautions to ensure that an adequate foundation is laid for admissibility of the animation at trial, especially considering the expense that may be involved in creating and preparing an animation.
- Counsel should disclose the animation to opposing counsel well in advance of trial.
- Some courts and commentators have suggested that simulations and their underlying data be exchanged before trial so that opponents may become familiar with them for cross-examination.
- Furnishing opposing counsel with the animation prior to trial may be an effective tool in encouraging settlement negotiations.
- The proponent of an animation may request a hearing and raise the issue of admissibility by way of a pre-trial motion.
- If counsel lays a careful foundation, then all forms of animation, including the tutorial, the illustration, and the simulation, should be admissible at trial.