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PRODUCT LIABILITY

An Interactive Qualifying Project Report

submitted to the Faculty

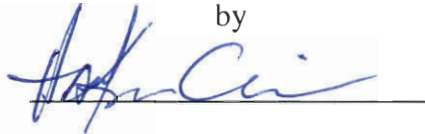
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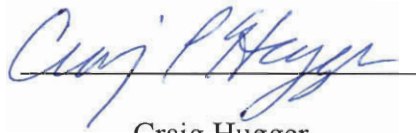
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Abstract

The Interactive Qualifying Project is intended to relate technology to society. The goal of this IQP is to portray the importance of engineering in the judicial system. The project team determined the causes and legal implications of three product liability cases. Through a complete study on product liability law, and examining depositions, reports and product literatures, the causes of the three accidents was determined. Accidents reconstruction and analysis of the depositions were found in excellent agreement with our conclusions.

Chapter 1: Introduction to Product Liability Litigation

Early in the century, the engineering profession was relatively shielded from legal challenges and profound ethical questions. This comfortable, provincial era no longer exist.

Modern technologies have led to a confrontation of the engineering community with the public welfare and social issues such as energy, environmentalism, consumerism and product safety litigation. Whereas the engineer was once faced with problems of relatively limited scope, the new technologies pose dilemmas that are no longer localized. The subject, product liability, must be viewed in the broader context of an increasing interaction between engineering and society. On the one hand, Congress, the courts and various consumer agencies are actively involved in establishing legal precedents in order to meet consumer expectations. And, on the other hand, these societal pressure present potentially staggering financial losses for U.S. business. The engineer, in the middle of this controversy, has a pivotal role to play.

1.1 Overview of Modern Product Liability Law

Today, litigation is becoming a more and more prevalent part of doing business. An injured party can sue either under tort or contract theories. The trend is toward strict liability, holding either a manufacturer or seller liable when a product that is “unreasonably dangerous” is placed on the market. But there is a wide discrepancy about

what a defect is, what standards of proof will be allowed, who will be held liable, who has standing to sue, etc.

1.1.1 Theories of Product Liability

The trend in the law of product liability has been simply to determine who is best able to pay for an injury and to hand down judicial dictates that will facilitate these social cost shifts. Fault and standards of care in production and distribution have become secondary considerations.

Product defects are still discussed by the courts, but are reviewed under new theories of liability. A product will still be found defective in one of four ways:

- Its design
- Its construction
- Its failure to give a warning, or
- Its failure to conform to an express warranty.

An injured party may sue a manufacturer or seller for these four types of defects under basically three different theories: negligence, strict liability, and breach of implied warranty. Under a negligence theory, a manufacturer or seller will be liable for an injury that was foreseeable at the time and that resulted from lack of due care. In contract, a manufacturer or seller will be liable under a breach of implied warranty theory if a harm occurs as a result of a product that is not fit for the purpose it was intended. Under strict liability, the focus shifts from the care taken by the manufacturer to the product itself. Strict liability varies from state to state.

1.1.2 Strict Liability

Strict liability is the most straightforward course of proceeding in a product liability suit. The theory basically ousted the concept of fault, and indicated that a manufacturer could be responsible for product harms no matter what care went into the designing and warning of a product. A court can hold that a manufacturer is strictly liable where its product proves to have a defect that causes injury to a human being.

The rationale for product liability as it has evolved includes:

1. People injured by an unreasonable dangerous product should be compensated in today's society of mass production and automation, despite the fact that manufacturers have used due care;
2. The cost of accidents should be spread among society and to all users of the product, and
3. Strict liability will serve as impetus to business to produce safer products

Strict liability is likely denied in situations involving unavoidably unsafe products, as it is unreasonable to hold a manufacturer liable for injuries resultant from a product.

1.1.3 Defect

The modern law agrees that a manufacturer has a duty to design a product that is free from defect. But the courts differ considerably in defining just what a defect is. As noted, some courts require proof that the design defect rendered the product unsafe if it is unreasonably dangerous. Others do not.

One of the most important considerations in a test defectiveness is the manufacturer's ability, within practical and technological limits, to improve the safety of

the product. The courts generally will weigh evidence of whether a product conforms with industry custom. But that is not an absolute defense.

Another factor considered is whether the product user anticipated the dangers of the product. The longstanding rule had been that a manufacturer did not have to warn or guard against an open and obvious dangerous condition of a product. While some courts still adhere to this view, there has been a move away from this concept. Unless the danger of a product is almost universal common knowledge, a product must be designed to prevent against even obvious dangers.

A product generally is considered to be unsafe in construction if it deviates from the manufacturer's design or performance specifications. Strict liability was adopted in this area because injured parties were not able to show that a manufacturer knew or should have known that the product was unsafe. It was merely an aberration of the industrial society.

Even if a product does not have a physical defect, strict liability may be applied if the product is unreasonably dangerous and the manufacturer fails to give proper warnings of the product dangers or proper instructions as to its use. A duty to warn may be required even where the defendant's use of the product is abnormal. The desire to compensate victims of product-related accidents has led some states to impose on manufacturers a broad duty to warn all foreseeable users of almost all possible hazards inherent in the use or misuse of a product.

1.1.4 Legal Considerations

Defenses:

In negligence cases, defenses to a product liability action can include assumption of the risk and contributory negligence. In some cases, if the plaintiff knowingly assumed the risk or contributed to his/her own injury, recovery will be completely barred. The majority of states have a qualified comparative fault system. Under this system, a claimant can only recover if his/her fault did not exceed that of the defendant.

Punitive Damages:

The majority of states permit a jury to award punitive damages. Proof must be made that any injury resulted from the defendant's intentional or reckless disregard for the safety of others. Punitive damages are imposed to punish a flagrantly careless behavior or the intentional acts of a company to put a product on the market it knows is faulty.

Statue of Limitation and Repose:

Statues of limitation set a time limit which a party can bring a suit once an injury occurs or is discovered. States differ, but generally a suit must be filed with in one to three years. Statues of repose differ in that they set a time limit in which a suit can be brought once a product has been sold. The one extreme puts an undue burden on the manufacturer, particularly those produce inductial goods and tools that last for decades. The other extreme often unduly limits the rights of an injured party.

1.1.5 Warranty Theories

In addition to strict liability and negligence theories, a manufacturer can be held liable under warranty theories. There are two kinds of warranties, expressed and implied. An expressed warranty is a specific representation about the characteristics of the product. Puffery, or mere opinion of the product, is generally not considered an express warranty. Express warranties are created by

1. An affirmative promise or guarantee of fact relating to the product, which induces the buyer to make a purchase;
2. A description of the product, which is made a part of the bargain, and
3. A sample or model.

In order for an injured party to have a cause of action under an express warranty theory, the purchaser had to have relied on the promise. In general, a manufacturer or seller will be strictly liable if he expressly warrants that a product will perform a certain way and it does not.

An implied warranty is one which the court imputes to every product. It is either written or based on statements to the seller. An implied warranty of fitness guarantees a product for a specified use. It is attached only when the seller knows how the purchaser intends to use the product and when the purchaser relies on the seller's judgment that the product would satisfy that use.

1.2 Legal Terms and Concepts

In order to function effectively as a designer or manager, the engineer must understand some of the legal ramifications of his work. This means understanding some fundamental legal terms and doctrines particularly as they relate to safety and product liability.

1.2.1 Contract and Tort

A contract is a binding agreement, for those breach the law provides a remedy. In the context of product liability, a contract will relate to the sale of a product. Such commercial transaction are governed by the Uniform Commercial Code (UCC). The UCC defines “contract” as the “total legal obligation which results from the parties agreements as affected by and any other applicable rules of law”. In many product liability cases, the concept of contract law pertinent to product liability is breach of warranty. Under UCC, warranty has been contract oriented. Nevertheless, warranty in its relationship with product liability has a hybrid origin in both contract law and tort law.

A tort is a wrongful act or a failure to exercise due care resulting in injury, from which civil legal action may result. A tort is often defined as a civil wrong independent of contract. Tort law establishes standards of human conduct and of duty, for whose breach the law provides a remedy. The law of tort seeks to provide compensation to members of society who suffer losses because of dangerous or unreasonable conduct of others. The tort theory of negligence is one of the most important in the context of product liability.

1.2.2 Negligence

Negligence occurs when one person fails to fulfill a duty owed to another or act with less care than would a reasonable and prudent person under the circumstances. Absence of an intent to cause harm is a distinguishing characteristic of negligence. For the tort of negligence to be recognized as a cause of action, two elements must be present,

- 1) a duty or standard of care recognized by law and a breach of the duty or requisite care, and
- 2) the breach of duty must be the proximate cause of harm or injury.

The standard for negligence is what a reasonable person would have done.

1.2.3 Causes for Actions

As discussed in previous sections, there are essentially three theories under which liability is imposed on the suppliers of products in the United States – negligence, breach of express or implied warranty, and strict liability in tort. These theories of product liability are not mutually exclusive. Thus, a given set of facts may give rise to two or more theories of liability.

In many cases, the circumstances will dictate the theory under which the suit for damages is brought. For example, a warranty liability is barred if injury is sustained after the time period defined by the statute of limitations, which runs from the date of delivery of the product. This would not prevent bringing a suit under the theory of strict liability in tort, because under this theory the statute of limitations runs from the date of injury.

Similarly, if the action is brought under the theory of negligence, contributory negligence on the part of the plaintiff will provide a strong defense to the manufacturer.

For this reason, most product liability actions today are brought under the theory of strict liability in tort, because contributory negligence is generally not a valid defense in most jurisdictions. This situation is in a state of flux, because the courts are increasingly indicating that comparative fault will apply in product liability cases.

Although breach of warranty has played an important role in the development of product liability theory, today the manufacturer is more likely to be sued in tort. This means either negligence or strict liability, the basic difference being that in negligence the litigation focus on the conduct of the manufacturer, whereas in strict liability the litigation focuses on the properties of the product, defective and unreasonably dangerous.

Under either of these two tort theories, there are similar areas in which engineering and management are vulnerable. There are the following:

- 1) Design
- 2) Manufacturing and material
- 3) Packaging, installation and application
- 4) Warning and labels

Design Liabilities

Liability stemming from design, whether they are imposed on the basis of negligence or strict liability, are usually based on the following premises:

- 1) A concealed danger has been created by the design.
- 2) Needed safety devices have not been included in the design.
- 3) The design involved material of inadequate strength or failed to comply with accepted standards.

- 4) The designer failed to consider possible unsafe conditions due to abuse or misuse of the product which were reasonably foreseeable by him.

The design engineer is directly concerned with potential liabilities posed by these four premises

Instructions and Warnings

The total responsibility accompanying product design, development and marketing includes more than just the duty to provide a safe, functional design. The manufacturer and the engineer have the additional duty to provide instructions and directions for using the product and warn of dangers involved in using the product. Failure to do so can result in liability under the doctrines of negligence or strict liability or because the implied warranty of merchantability would not be satisfied in the absence of necessary instructions or warnings. To have any effect, instructions and warnings must warn of the dangers inherent in the failure to follow instructions or warnings.

1.3 Litigation Process

Product liability litigation will almost inevitably revolve around some perceived deficiency in a product. If a deficiency exist, its ultimate source may lie in design negligence, in design defect, in production defect, or in a combination of these factors. A company's success in defending against a product liability suit depend on three main factors:

- 1) the nature of the accident, who was injured or what was the damage;
- 2) the legal expertise of the attorney seeking damages; and

- 3) the competency of the experts who examine the product and supply the technical testimony.

But, how is a law suit started? How do the plaintiff and the defendant present their cases? We'll explain in the following sections.

1.3.1 Accidents

Any law suit is always started with an accident. In product liability law suits, the caused and effects of product related accidents are adequately documented by the National Safety Council and various government agencies. In a commercial environment, product failure can cause any combination of personal injury, property damage, and business interruption. In home, personal injury usually overshadows consideration of the property damage. Most product failures do not result significant damages, and the people involved simply absorb the physical or financial damage as part of the hazards of daily life.

1.3.2 The Plaintiff Seeking Legal Advice

After an accident, the injured party, the plaintiff, is considering a law suit. However, the plaintiff needs legal advice. An attorney will listen to the client's story and immediately evaluate whether or not there is a case: has there been sufficient personal, physical or business injury or combination thereof? The attorney must also examine the jurisdiction and the law that will most likely apply to the case. On the subject of jurisdiction, we need to mention the effects of long-arm statute: Even if a product was

made, sold and distributed only for use in a remote state, suit could conceivably be brought in the jurisdiction familiar to the attorney. This obviously aids his efficiency in prosecuting the suit, later, in collecting damages.

As to the law that best applies to the case, we have mentioned warranty, strict liability and negligence. These are the main charges around which the plaintiff attorney can structure a case.

After the specific product has been identified, the plaintiff attorney will exert every effort to obtain physical control of it. It becomes the charge of the attorney and the attorney's engineer to pinpoint the role of the item in the accident and to identify some specific negligence on the part of those who put it into the stream of commerce.

The attorney, normally, will call in an engineer to render a preliminary technical opinion in some cases, a full verbal opinion in others, or a full written report. A preliminary opinion is used when the aggrieved party's story is incomplete and the attorney wants the engineer to answer the question: Could the accident have taken place as the client alleges?

1.3.3 The Expert Examination of the Product

The first stage in the engineer's investigation is to gather information. He or she reads all written material the attorney has about the case. Then the engineer gathers any available data from commercial literature, scholar journals or government documents about the failure characteristics of the product and its component materials.

The engineer attempts to show that the defendant created a "hazard" and an undue "risk" to the user. Some hazards can be termed negligible or safe because malfunctions

will not result in injury or damage. When an engineer is called in on a case, he can not overlook that this may indeed be true of the product at hand, even if it is alleged to have caused an accident. He must keep an open mind. There is risk inherent in the use of virtually any product or service, open and notorious. People frequently assume some risk when using a product, but a manufacturer's negligence may raise the combination of hazard and risk to an unacceptable level.

The key points to be considered by the engineer are:

- 1) Could reasonable prevention or prudent care have eliminated the exposure or proximity?
- 2) Could the risk have been recognized by the user?

1.3.4 The Complaint

As soon as the engineer communicated to the attorney that he has proof of negligence relating to the cause of the accident, the attorney prepares a legal complaint document. He aims this complaint at every party who had any connection whatsoever with the product, from birth to construction to sale to service to inspection. As the chain is traced back to the manufacturer, individual engineers, designer and all supervisors will sooner or later be identified and added to the complaint. It stands to reason that the plaintiff attorney does not hope to win much money from any of these individuals, but as they defend themselves they will help prove his case of corporate negligence and that is where the jackpot lies

The reasoning behind sue everybody bears repetition because of its extreme importance to both the plaintiff and the defense: As each of the parties seeks dismissal of

the case against himself, or mitigation of exposure to damages during the jury trial, the plaintiff sits with a “no-lose situation.

It is relatively easy to trace the history of a consumer product. The retailer usually reveals the identity of his distributor as soon as he is alerted by the plaintiff attorney that litigation is pending. The distributor readily identifies the manufacturer. Later on the identities of the designers and other manufacturing personnel become known when the attorney gains access to drawings, memoranda and production orders.

The complaint, delivered to the secretary of the corporation or the merchant in his store, sometimes is the first indication a defendant has of the impending suit. Complaints are immediately turned over to the defending insurance firm or attorney. These parties usually respond with a complete denial of all charges. Some defending attorneys, whether or not they work for an insurance firm, have such denials virtually ready to go, and need only fill in the pertinent details of the case at hand.

1.3.5 Questioning and Examination

The next stage in the legal proceedings amounts to a mutual probing of weaknesses and strengths by each side. The idea is for the opposing sides to ask each other questions and examine the product and all related evidence

The Interrogatory

In some states and federal courts, the prevailing method is the interrogatory. Interrogatories are written requests for information. They may be sent by either side, but

are most often used by the attorneys for the defendant firm's insurance company to question the plaintiff in depth. Many a defendant firm manager has been hit with a request by his firm's attorney to list all possible details he would ask about in an accident situation involving the firm's product. An interrogatory prepared by the plaintiff attorney can ask for drawings, reports, memos and all kinds of background information..

The Deposition

The more favored but very expensive method is the taking of a deposition; it is used in addition to an interrogatory. A deposition is a face to face encounter between an attorney and a witness, with stenographic recording of the sworn testimony. Here, the questions are propounded as the answers are received. A good, experienced deposition attorney can pick up a contradiction in statements from even the slightest nuances. And he zeroes in before the witness even has a chance to realize what he was doing. Depositions also give the attorney a chance to evaluate the witness's potential impact on a jury should the case go to trial.

Examination of Evidence

The plaintiff attorney, especially in extremely high value cases, will go to any lengths to obtain every thing even remotely connected with the product and the operations of the firm. An intensive investigation was triggered by the contradiction between requirements and production. Once all information is on hand, the outline of the case are pretty much established, and all evidence has been secured, the case is put on the court calendar for trial.

1.3.6 The Trial

A trial is not a dispassionate and cooperative effort by all the parties to arrive at justice. It is the adversary system, the competitive system in the administration of law. In a court, the lawyers are the ones who develop and present the case.

A plaintiff's case is immeasurably strengthened if he retains an important, big-name trial attorney who personally conducts the settlement negotiations as opposed to having an associate doing so. The defendant attorney wants to buy off a case as cheaply as possible. The plaintiff attorney starts at an astronomical figure. He then constantly changes his negotiating position so that he shows first one strong point and then another as he forces the other side up and up in its offers.

Direct Examination

Let's examine the type of questioning which the plaintiff expert witness may undergo. With a few obvious changes, the defendant's experts will undergo pretty much the same. There are, basically, three parts to the scenario:

- 1) establishing the expert's qualifications;
- 2) establishing the details of the accident and subsequent inspections, reports and testing; and
- 3) making ready for cross-examination.

Cross Examination

The cross examination begins when the opposing attorney tries to destroy the impact of the expert's testimony. It is always impossible to predict with accuracy of the extent of or thrust of the cross examination, and sometimes witness have had unpleasant surprise. Some preparation should be made for attacks along the following lines:

- 1) An attack on qualifications. Rarely, if ever, has the plaintiff's expert had all his experience and training focused on the subject under discussion in the lawsuit. No engineer can be an expert in all fields, and attempts will always be made to minimize the expert's experience.
- 2) An attack emphasizing that the expert has been retained for the purpose of testifying and is being paid for came. The answer to this is that the expert is being paid for his time, and he is answering truthfully as to the findings of his examinations and his opinions.
- 3) An attack on the expert's lack of direct experience with the particular mechanism under examination. Very few plaintiff experts are available with specific experience in a narrow, detailed area.

After both sides have exhausted the legal pyrotechnics available, they sum up their cases to the jury. The judge charges the jury on the laws that apply to the case and their responsibility in finding on the evidence.

1.4 Engineer's Role in Product Liability

In order for the product liability litigation to focus on the dominant technological questions, it is usually essential that engineers be involved in the litigation process as expert witness. It is the engineer, after all, who knows most about the product.

One definition of an expert is “a person with knowledge and technical ability in a given field, gained through education or experience, and the ability to articulate this knowledge, which makes this person more of an authority on the subject than the layman.” Almost every serious product liability suit involves engineering expert witness.

For an alleged design defect, the engineering experts’ assessments require the following:

- 1) Identification of the design error or errors that occasioned the injury.
- 2) Enumeration of alternative design features proposed to reduce the danger.
- 3) Evaluation of these features relative to the expected performance standards of the product, as well as their effect upon the product’s subsequent usefulness and cost.
- 4) Comparison of this product with other similar products.
- 5) Establishment of the causal link between the design defect and the injury.

In the following three cases, we use our engineering knowledge gained in WPI to attempt to establish the assessments listed above.

Chapter 2: Frazier vs. V-B Power Tool Company

2.1 Background

On May 14th, 1996, John Frazier (Plaintiff) severely injured his left hand and fingers when, while operating a 10" table saw model 3400-type 2 (shown in Figure 2-1), designed, manufactured, distributed by S-B Power Tool Company (Defendant). Mr. Frazier was ripping a piece of wood that was approximately 27 inches long, 2 ½ inches wide and ¾ inch thick. It is claimed that Mr. Frazier's left hand came into contact with the saw blade because of a kickback that was caused by a defective rip fence and defective anti-kickback fingers. Mr. Frazier amputated his left thumb, index finger, long finger and ring finger. Under both theories of negligence and breach of warranty, a product liability law suit is filed against S-B Power Tool Co. for it's negligence in design manufacturing and distribution of the table saw.

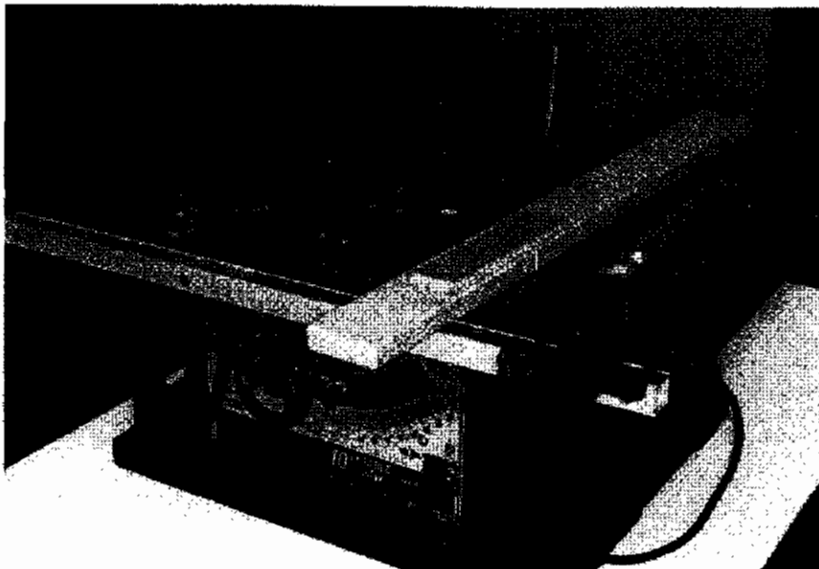


Figure 2-1: Skil Table Saw

This project team studied available materials on John Frazier vs. S-B Power Tool, including interrogatories, depositions, product reports and exhibit photos. After a detailed case analysis, the team members are able to reconstruct and describe the accident of Frazier. The project team then identifies the responsible party for this case.

2.2 The Complaint

The complaint from Frazier used the theory of negligence and breach of express warranty.

Count One: Negligence

- S-B Power Tool negligently designed, manufactured, sold and distributed the table saw, placing it into the stream of commerce, where Frazier encountered it and was severely injured.
- S-B's conduct constitutes negligent design, manufacture, distribution and sale, together with negligent failure to warn of the dangerous propensities of the table saw.
- This negligence was a proximate cause of Frazier's injuries.

Count Two: Breach of Warranty

- S-B's conduct constitutes breaches of warranty of express and implied merchantability and fitness for particular purpose, which breaches of warranty were the cause of Frazier's injury.

The plaintiff demanded a remedy for medical expenses, physical and mental suffering.

2.3 Interrogatories and Depositions

This case is focused on negligence and breach of warranty. Is the table saw a defective? And, does S-B gives proper instructions and warnings in using the table saw? Let's first examine the interrogatories and depositions from the case.

2.3.1 Deposition of John Frazier

The Accident

Mr. Frazier recalled the accident of May 14th, 1996. He was visiting his daughter in Agoura, California. At the time of the incident, Mr. Frazier was cutting a piece of pine wood on a SKIL 10" Table Saw. He had a piece of wood about twenty-seven inches long, two and one half inches wide, and three-fourths of an inch thick. Mr. Frazier needed to rip about three-sixteenths of an inch off of one side to fit it into a corner. He set the fence of the saw and proceeded to pushed the wood along the fence through the saw blade. Mr. Frazier had ripped about half the work piece when it suddenly kicked back violently and his left hand contacted the saw blade. At the time of the accident, Mr. Frazier was wearing dungarees, a short sleeve shirt, sneakers, safety glasses and a nail apron. No witness was present at the time. Mr. Frazier's description of the accident did not identify any causes relevant to S-B's table saw. At meantime, he did not give any information about the way he set up the table saw.

The Injury

After the accident, Mr. Frazier's left hand had severe injury. The middle finger was amputated, the ring finger and index finger were fractured and semi amputated only remaining attached to his left hand by a little skin, and the thumb was cut down through the nail almost to the first knuckle. Mr. Frazier claimed that he had little use of his left hand since the accident because of the injuries along with nerve destruction in the hand. Mr. Frazier had numerous surgeries from the date of the accident to May 1997. At the present time, he has little to no feeling in his left ring finger, his left middle finger is



Figure 2-2: The Injury

amputated and the stump is very sore (see Figure 2-2). Mr. Frazier's index finger had metal in it which was recently removed and he has no feeling in it. As far as activities being curtailed, he said that he is prevented from performing most of his normal activities with his left hand. To date, Mr. Frazier has incurred approximately \$44,483 in medical expenses.

In this part of the deposition, this project team found a very suspicious phenomenon that could be a key to the case: the little finger did not get cut! If Mr. Frazier was operating the saw like he said in the previous part of the deposition, the little finger should contact the blade before any finger else in his left hand. The only reasonable answer to this is that his left hand was behind the blade just before the accident. But, did the kickback cause his hand being thrown to the back of the blade? We need to see more evidences to decide.

Answers Related to the Cause of the Accident

Mr. Frazier admitted that he had previous experiences with table saws and understood the cause of a kickback event. He had the table saw for a few years, but he only used it for less than total 4 hours. When he was questioned on whether he read all product instruction documents. Mr. Frazier said: "I just went through them and know where they are ... I don't read them unless I have problems." Such statement clearly implies that Mr. Frazier did not read all product related materials before using the table saw.

As Mr. Frazier implied, the project team had strong feeling that he did not read through the product information documents before setting up and using the table saw. The product manual contains information on proper set-up procedures for the table saw and product safety information as well. Product information documents are essential to

the count of negligence in this case. If all proper warning and instructions are given, then the negligence becomes a false charge.

Mr. Frazier did not use a push stick for the cut, which is required to aid with a push stick by the user's manual. He said that he had a push stick in his back pocket and there is no way he can use it at his stand point. He set the blade about 2 inches high for a 3 of 4th's inch thick piece of wood. That blade height is about 1 inch higher than the height given in the safety instruction of the user's manual.

The project team agrees that it had become Frazier's own fault for not using the push stick for this specific operation, since the push stick is required by the user's manual. The blade height (Figure 2-3) does not agree with the safety height required by



Figure 2-3: The Height of the Blade (appears to be over 2 inches)

the user's manual. These two points give us evidence that Mr. Frazier did not follow the instructions given in the user's guide. Negligence can not apply in this part of the case.

After the accident the table saw is store at Frazier's house in Braintree, MA. From June 28, 1996 to May 12, 1997, the saw was store by Darry Robert Holt, P.E., Holt Associates in Concord, NH. During that period, Mr. Holt made visual inspections and took photos of the table saw. He said that Mr. Holt noticed that the fence would not align parallel to the saw blade, a condition which can and did cause a kickback. Further, the anti-kickback device was inadequate to prevent the kickback and the blade guard was inadequate to prevent the kick back and the blade guard was inadequate to provide protection during such an event. There were no warnings or instructions relative to these deficiencies in the manual or on the machine. Mr. Frazier obviously was giving a false statement. He also believes that the saw does not comply with the ANSI/UL Standard for stationary and fixed electric tools, nor good engineering design practice.

Now, for the charge of breach of warranty, we need to know whether the anti-kickback mechanism was working properly at the time of the accident. Mr. Frazier did not give any useful information in this part. He only noticed some thing wrong after the Mr. Holt, took the saw to Massachusetts. It has a very high possibility that the fence guard could be damaged during shipping and handling process. Mr. Frazier said the table saw is defective just because Mr. Holt took a few pictures and did some measurements, but he has not strong hard copy evidence to back up his statement. The project team feels that Frazier gave virtually no usefully supportive evidence to built his case in this deposition.

2.3.2 Deposition of Peter Domeny

Peter Domeny is the Director of Safety and the Manager Safety Office in S-B Power Tool Company. He said that the company has been manufacturing this table saw since 1992, and this is the first product liability lawsuit involving the table saw. The table saw has a saw blade of 10 inches in diameter, and it is protected by its guarding system, which include a blade guard. The features of this table saw model are:

- 1) The rip fence clamps to the table.
- 2) After the clamping, the rip fence self-aligns to the desired position in parallel with the saw blade. The user need to just push down on the lever and as he/she pushing down, the alignment is achieved.
- 3) Anti-kickback pawls are part of the table saw to reduce the harm caused by a kickback event.

Mr. Domeny told that all safety parts besides the anti-kickback pawls had been tested and all tested data sheets are available. Since it is important for the user to maintain the rip fence parallel to the saw blade, S-B conducted many test in the rip fence. As the result shown, the rip fence does align parallel to the saw blade automatically every time. The test also shoe that it is the self-aligning through the clamping process to the degree and accuracy that the user have aligned it the begin with.

The anti-kickback pawls were built to seize a piece of wood in an event of kickback. The direction of the force in which the pawls move are always in the same

plane as whatever the blade or the spreader is set for, in this case, it is perpendicular to the table face or the wood upper face. The piece of pine wood, 27 inches long, 2 and half inches wide and 3 quarters of inch thick is a dimension that would be within the realm of anticipated use for the table saw.

This project team feel that Mr. Domeny's deposition gave useful information in designing, manufacturing and sales process areas for the S-B table saw. It is noted that all proper warning and instructions were given to the customers at the time of sale. These documents contain critical information for a customer to know about any safety related topics about the table saw. If Mr. Frazier had followed all the instructions and warnings, the risk of a kickback can be practically eliminated.

2.4 Analysis & Accident Reconstruction

2.4.1 Warnings and Safety Instructions

The table saw gives user warnings and instructions through the big yellow warning signs on the saw and the user's manual. On the saw the following warnings are given in capital letters:

- ALWAYS USE BLADE GUARD AND SPLITTER FOR EVERY OPERATION. IT MAY BE USED INCLUDING ALL "THRU-SAWING"
- KEEP HANDS OUT OF PATH OF SAW BLADE
- KNOW HOW TO AVOID THE RISK OF KICKBACK
- NEVER REACH IN BACK OR OVER SAW BLADE

In the user's manual, the word "push stick" repetitively appears under the section on ripping a piece of wood for less than half inch. This specific operation instruction also contains a procedure diagram to make consumer understand graphically. The table saw also has a certificate that shows it meets all safety requirements.

2.4.2 Accident Reconstruction

The keys for accident reconstruction in this case are:

- 1) The little finger is not damaged: why the physical evidence shows that the blade entered the thumb first? The only reasonable answer to this is that Mr. Frazier's left hand was in the back of the saw blade.
- 2) The teeth marks on the piece of wood: why do they appear to be dig into the side of the wood? (Figure 2-4) This project team feel that Mr. Frazier pulled the wood away from the fence and caused those teeth marks, and consequently, the act caused a kickback that threw the wood back towards Mr. Frazier.

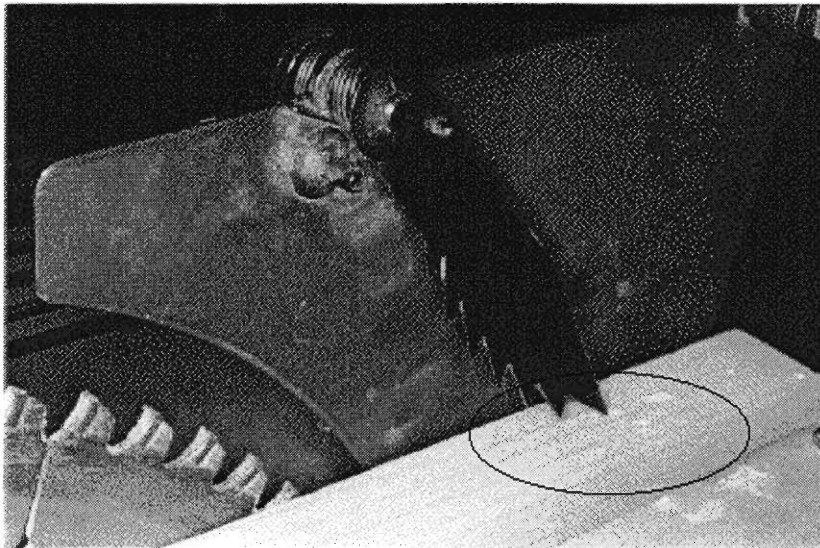


Figure 2-4: Marks on the Wood (circled area)

Based on the analysis above, this project team reconstructed the accident in the following statement:

Mr. Frazier failed to read and follow the user's manual for the S-B table saw. He did not use the specified push stick for a very dangerous ripping operation. While he was

ripping the piece of wood, he was not using the blade guard that was provided with the saw. When he saw the wood piece coming out of the blade is still wider than the desired width, Mr. Frazier decided dangerously reach over behind the blade to grasp the wood to make the incoming piece fed to the left and away from the rip fence. A kickback occurred as a reaction to such act, and that threw his left hand toward the blade. His thumb entered the blade first, then the index finger, middle finger and part of the ring finger. The little finger was spared because the hand was thrown upward by the rotating blade as the other fingers were cut.

2.5 Case Conclusion

After a thorough analysis of this case, the team found:

- S-B Power Tool Company holds no reliability to the Frazier accident of May 14th, 1996, because
- Mr. Frazier did not read and follow proper warnings and procedures given by S-B Power Tool in its user's manual, and
- the table saw is on excellent condition, no problem in alignment of the fence that could caused a kickback, and
- the table meets all safety requirements contained in these standards: ANSI 01.1, ANSI/UL 987, OSHA 1910.213, and
- if Mr. Frazier had followed the User's Guide as it illustrated for ripping operation, he could not have been injured.

Chapter 3: Hernandez vs. Mackenzie

3.1 Introduction

On Tuesday, July 21, 1992, at 9:08am, the defendant Michael MacKenzie was involved in an automobile accident with Laura Hernandez on Route 12 in the town of Ashburnham, Massachusetts. Subsequently Laura Hernandez died in the accident. Laura Hernandez was travelling in a 1983 Dodge Aires. She in the northbound lane travelling West. Michael MacKenzie was driving a 1987 Int. Tractor with a partially filled water tank in tow. Mr. Mackenzie was travelling in the East in the southbound lane. Robert Kohlstrom had been travelling in the northbound Lane and had seen the Mr. Mackenzie travelling in the southbound lane moments before the accident. He returned to the accident and was one of the first people at the seen of the accident. Police Chief Ronald Laplante was the first officer at the seen of the accident and took statements from Michael MacKenzie. The Fire Department and the Ambulance were also called to the seen of the accident. Fire Lieutenant Riccioni took several photograhs of the accident seen.

3.2 Complaint

Hector Hernandez is suing Michael Mackenzie and his employer Zachery Taylor for damages caused by the accident on July 21, 1992 in which Laura Hernandez was killed. Hector Hernandez is the Administrator of the estate of Laura Hernandez, Giselle Fred, Louie Fred, Alex Rodriguez and Laurimar Rodriguez. Stephen Campobasso, and Patrick Brunnell, of The Campobasso Law Office are representing the plaintiffs. Alfred Monahan, of the Law Offices of Richard Blume, is representing the defense.

3.3 Depositions and Evidence

3.3.1 Deposition of Ronald Laplante:

Ronald Laplante is the Chief of Police in Ashburnham where the accident took place. He does not have any formal training in accident reconstruction. He had instructed the Fire Lieutenant to take pictures at the scene of the accident. He had been informed later that Robert Kohlstrom, may have been a witness to the accident by a local business owner. It was later determined that Mr. Kohlstrom had not witnessed the accident. The only useful information Robert Kohlstrom could offer was that he saw MacKenzie hugging the centerline well before the accident.

Ronald Laplante nor the state police did do an accident reconstruction the day of the accident or anytime after. He had done a sketch of what he believed happened at the time of the accident. He believed that accident had occurred in the southbound lane. Implying that Laura Hernandez had crossed the yellow line and struck the Mr. MacKenzie's truck. He came to this conclusion by an unnatural marking, or indentation in the road. He claimed that it was the point of impact because he hadn't ever seen anything like it in the road before. He also testified that the car Ms. Hernandez was driving was not properly registered. Also, Ms. Hernandez had a pair of speeding tickets and had been involved in two accidents within three years of her death.

3.3.2 Deposition of Michael Mackenzie

Michael Mackenzie had been working for Zachery Taylor for several years. He had acquired his license to drive trucks in May/June of 1992 and the accident occurred in Mid-July of the same year.

On the day of the accident, Michael Mackenzie supposedly had enough sleep the night before. Mr. Mackenzie had done the proper safety checks of his on the tractor-tanker before he left his employer. He then filled the tanker at Whalom Lake and to fill swimming pools with water. At the time of the accident he had finished his first delivery and was driving in the southbound lane. Michael Mackenzie claimed to be fairly familiar with the area of road he was travelling on. The defendant claimed to be travelling at or less than the speed limit at the time of the accident. He was driving around a curve in the road and when he finished the turn he collided with Laura Hernandez. The defendant was not sure of where he was located in relation to the double yellow centerlines. Mr. Mackenzie claimed he did not see her car, except for the Ms. Hernandez's trunk over the engine of his tractor, an instant before impact. He was not sure of where Ms. Hernandez car had come into contact with his tractor. Michael Mackenzie was not sure if he had applied his breaks when he was driving around the curve in the road or if he was just coasting.

3.3.3 Deposition of Charles Dietrich

Mr. Dietrich an Electrical Engineer with Master's and Bachelor's degrees from the Massachusetts Institute of Technology. Mr. Dietrich was the expert witness hired by the defense. He testified that it was his opinion that Laura Hernandez was in the Southbound lane and had caused the accident with Michael Mackenzie. The expert

came to this conclusion by the location of tire marks and by the point of impact given on the police report.

Mr. Dietrich claimed that the Aires, came into contact with the front, left bumper of the tractor. After impact the car spun out and ended up in its final resting position facing the wrong way. He concluded that the tractor must have hit the front quarter-panel, near the front door of the Dodge Aires, causing the significant damage to the driver's side. During the collision the tractor's front, left tire was forced outward into a left turn position. The damage done to the tractor's steering system, by the Aires, locked the tire in this position.

Mr. Dietrich, that simultaneous to the accident the truck began to bounce from the impact to the car as denoted by several large, tire, gashes left on the road on the southbound side of the double yellow line. He claims that Michael MacKenzie then applied the brakes, which caused the skid marks in the police photographs. The gashes are very near the centerline. Mr. Dietrich claimed that the truck did not displace to the right from the collision of the car. He claimed that since the tractor-trailer weighed much more than the car, it could not be moved side-ways by the car. Since the front left tire was locked into position, the truck crossed the double yellow line and slammed into the guard-rail.

Mr. Dietrich's had not accounted for certain facts in his testimony. He based his opinion off, of the police photographs, the police reports, the repair photographs of both vehicles, and the repair estimates for both vehicles. He did not actually visit the scene of the accident, he only drove through the area. Charles Dietrich did not actually take any

measurements of the radius of curvature for the turn, nor did he make any possible speed calculations.

3.3.4 Deposition of James Burson

James Burson was a retired state trooper for the State of Massachusetts. When he was with the state police, he performed accident re-construction for his unit. He had a limited amount of training in the state police. Mr. Burson was the first expert for the plaintiff. While a state trooper, Mr. Burson received several crash courses in dynamics, the motion of bodies before and after collision, the causes of skid marks, and other valuable information in accident re-construction.

Mr. Burson actually visited the scene of the accident twice. The visits both came many months after the accident happened. He witnessed that the vehicles, trucks and cars alike, travelling on the road, tended to sway toward the center line as the vehicles came off the turn. Sometimes the cars actually encroached the southbound lane. Burson concluded that Mr. Mackenzie was driving too fast and crossed into Ms. Hernandez's lane from centrifugal force created on the truck. He used a formula from one of his text books and figured out a possible velocity, from all of the damage and the length of the skid marks.

3.4 Accident Reconstruction and Analysis

The accident that took place between Laura Hernandez and Michael Mackenzie is a very difficult accident to reconstruct. There were not any witnesses other than Michael Mackenzie. The photographs taken at the scene of the accident weren't very good and unfortunately there was never a real accident reconstruction done. The tire marks on the road are very difficult to decipher. In some of the photographs there will be dozens of tire marks left from cars travelling through engine fluid leaked from the Dodge Aires. In order to reconstruct this accident properly, it will be imperative to examine each bit of evidence as closely as possible.

First we must examine the testimony of the only witness to the accident, Mr. Mackenzie. He stated that he was travelling in between thirty and thirty five miles an hour. Upon close examination of the photographs, one will notice that the speed limit is 35 miles per hour.

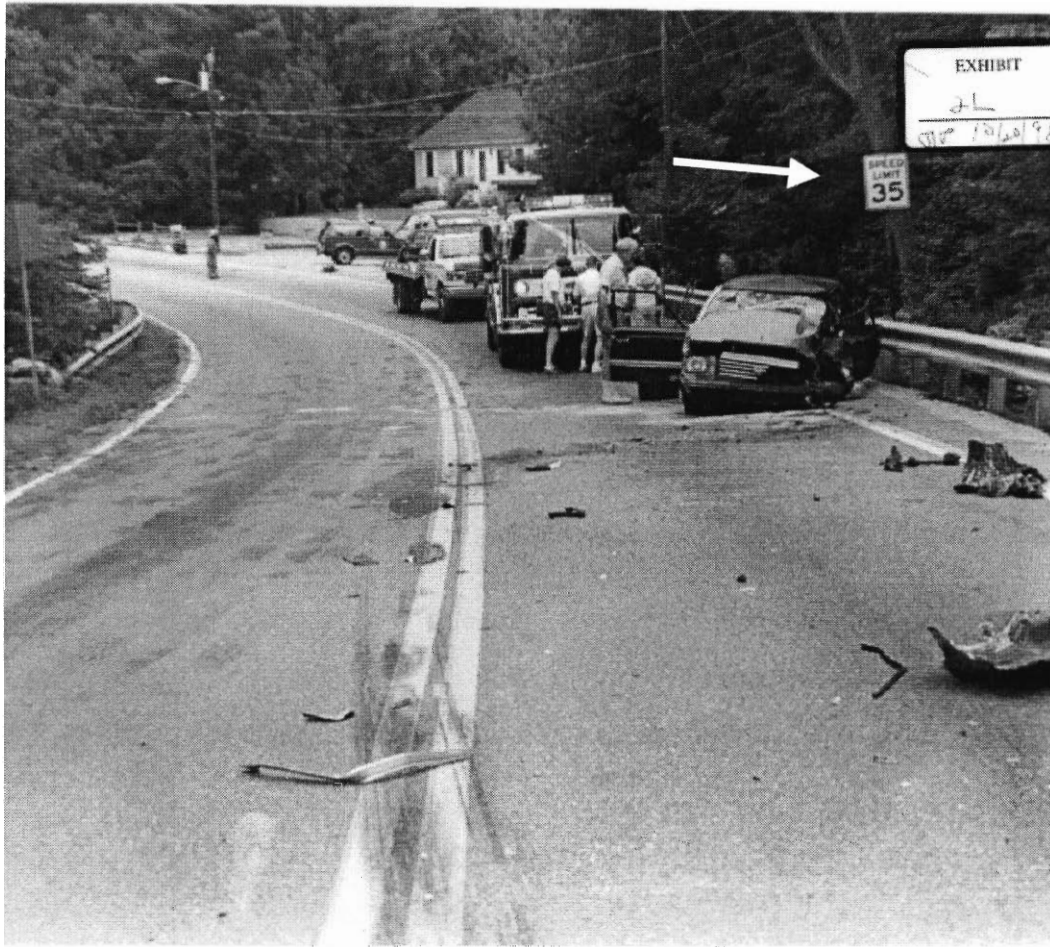


Figure 3-1

According to his testimony, he should have been within the speed limit. A car that would most likely be safe, but with tractor-trailers they have a much larger mass and higher center of gravity. A tractor-trailer would be more likely to carry into the another lane, then a car would.

As observed by the James Burson the cars in the Southbound lane tended to hug the centerline. Also truck drivers are more likely to 'cheat' or over compensate for a turn. Cheating is accomplished by taking the turn extra wide. One could conclude that

MacKenzie would have 'cheated' in this turn, because he had 'cheated' earlier, as witnessed by Mr. Kohlstrom.

Of course, that is sheer speculation and is not hard core fact. A greater understanding of what happened in the accident between Ms. Hernandez and Mr. Mackenzie; can be accomplished from examining the police photographs and other photographs taken by both sides of the case. Portrayed in the picture below, is the centerline of the road with several white scrape marks in the northbound lane. Also there are several tire marks on or around the centerline.

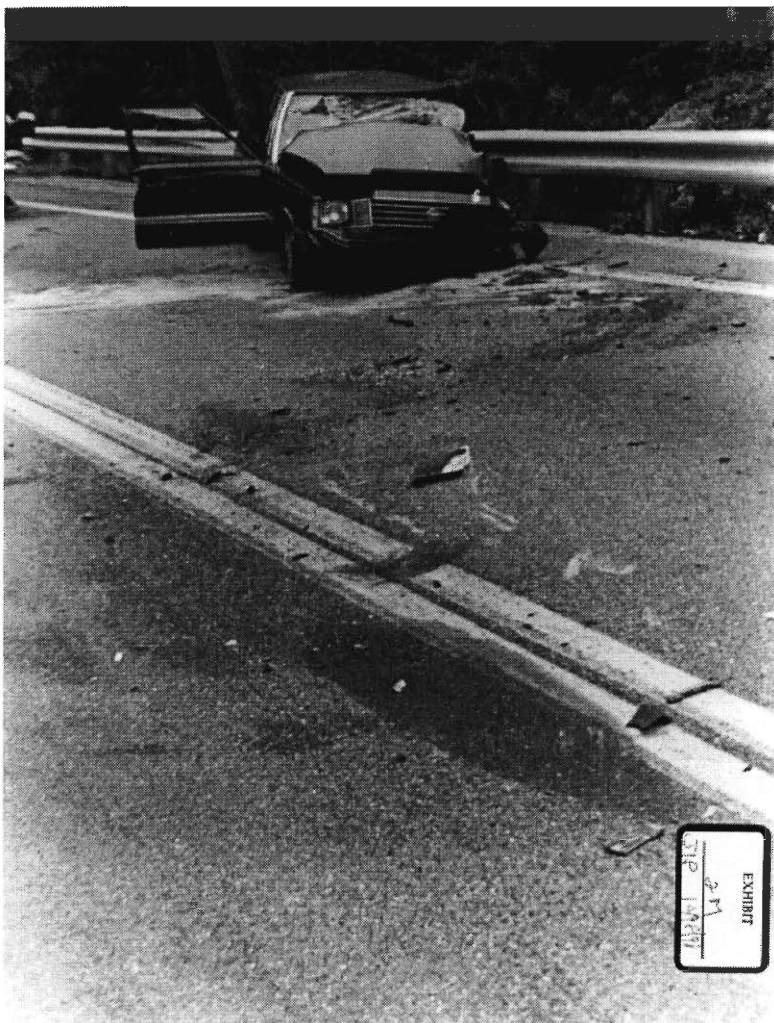


Figure 3-2

Charles Dietrich claimed that the large tire mark was where the tractor had begun to bounce after impact with the Aires. He also claimed that the tractor was in its proper lane because this tire mark was in the proper lane. According to Dietrich, the tractor was not displaced in any direction, by colliding with the Aires, because of its relative mass. In this case the masses of the tractor trailer to car ratio is in the order of ten to one. Yes, it is a great difference, but even simple conservation of momentum one would figure that the tractor-trailer would have to be displaced a little bit. All it would have to be displaced is a few inches to be on the wrong side of the road.

Another important fact is the relative height of the tractor-trailer's bumper to the bumper of the car. The tractor trailer's bumper is much higher than the bumper of the car. In fact one could almost fit the hood of the car under the tractor. In head on collisions between tractors and cars, the tractor tends to ride up onto the bumper, and then the hood of the car. Evidence of this is found in the picture below:

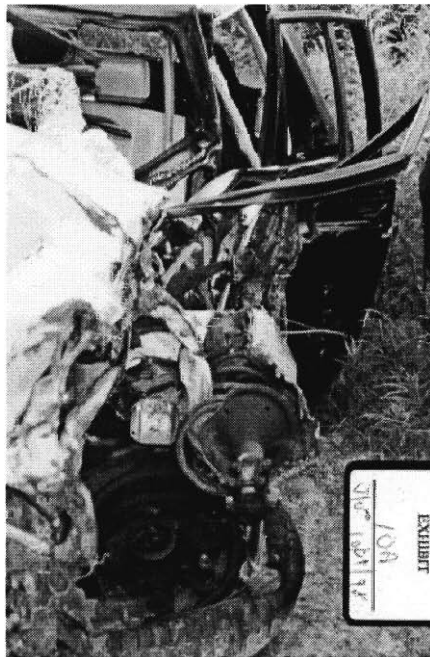


Figure 3-3

As one can see, the damage done to front, left tire and suspension of the car the appears to have been pulled away and smashed into the ground. This would hold true to the white scrape marks seen in picture2 on the northbound side of the centerline. The cars undercarrage actually slammed into the ground and caused those scrape marks. The truck actually drove up the left side of the car. Since the weight of the truck, the cars frame gave way and ripped down and outward. Splitting the tire and the suspension from the car.

The photograph, also, portrays the passenger side of the windshield, the windshield support, and what remains of the passenger side door. The damage as done to the before mentioned parts also hold true to a tractor travelling up the side of the tractor. The tractor's front, left end was now on the car, leaving the front right end in the air. The car is actually acting like a wedge lifting the truck for an instant. The weight of the tractors unsupported right side pulls the tractor to the right. This can be seen by the damage done to the door and the frame of the windshield. The windshield frame and the passenger door are also pulled down and to the left. The pulling damage to the car was done as the Tractor was coming back down to the ground, causing the gigantic tire mark left on the centerline in picture 2. All that is described happened in an instant, a fraction of a second at best.

Also seen in picture in the picture above, is a horizontal tire mark across the double yellow line. That tire mark is the front left tire of the Dodge Aires. It had been slammed into the ground, out and away from the cars body. The car also began to spin out in the same instant the tractor drove up onto the car. The front left side of the car was

pinned against the ground not free to move. The car was probably travelling around the speed limit of 40 miles per hour and so it the car had a certain amount of kinetic energy and momentum. The car would want to continue moving forward, but the front left side could not causing the car to spin out. Since the front left tire was pinned against the ground, it left a skid mark in a circular pattern across the yellow line.

In picture seen below, we can actually determine an approximate point of impact.



Figure 3-4

Upon examining the photograph, the area in which the car suspension and tire was originally located had been completely devastated. Yet the front left headlight and bumper only received a fair amount of damage. It almost appears to be pulled back by a glancing hit. This would lead to the conclusion that the truck actually came into contact just behind the headlight, in the area is completely destroyed. In picture five, there is a

line drawn where the point of impact was approximately. The bumper would be pulled back and crack as seen in the photograph. The entire fender would be pulled back as the tractor's bumper slammed into the car and began to ride up the car. The front left of the hood would then be forced down. The headlight would be smashed from the deformation of the surrounding parts and possible contact to the bumper.

The next question to this whole ordeal that needs to be answered is how and why the truck ended up on the wrong side of the road after the collision and slammed into the gaurdrail. In order to understand what happened we must first examine the damage that had been inflicted to the tractor. In the picture below, one will notice all of the thick, black tire/skid marks left by the tractor. Marked as one, is the gigantic gash mark where the tractor landed from after the impact with the car. At first the tire marks are only left by the front left tire in small dashes, then all of the tires lock, and skid marks form. The skid marks trace the path of the tractor into the gaurdrail. It seems highly unlikely that the operator of the tractor would purposely steer into the gaurdrail.

We will assume that Mr. Mackenzie did not drive into the wall on purpose, but was forced into the wall. The reason why he was forced into the wall, was from damage done to the steering from the collision of the car. As seen in the picture below the bumper is actually bent behind the tire.



Figure 3-5

The bumper would have been bent back upon initial impact with the car. This is only logical. Both the car and the tractor were travelling at speeds faster than thirty miles an hour. The bumper would have easily given under the enormous force created upon

impact. The force would have moved the bumper back and around the tire. Except in the picture above the bumper is behind the tire. In order for this phenomenon to occur the tire must have been turned outward as seen below.

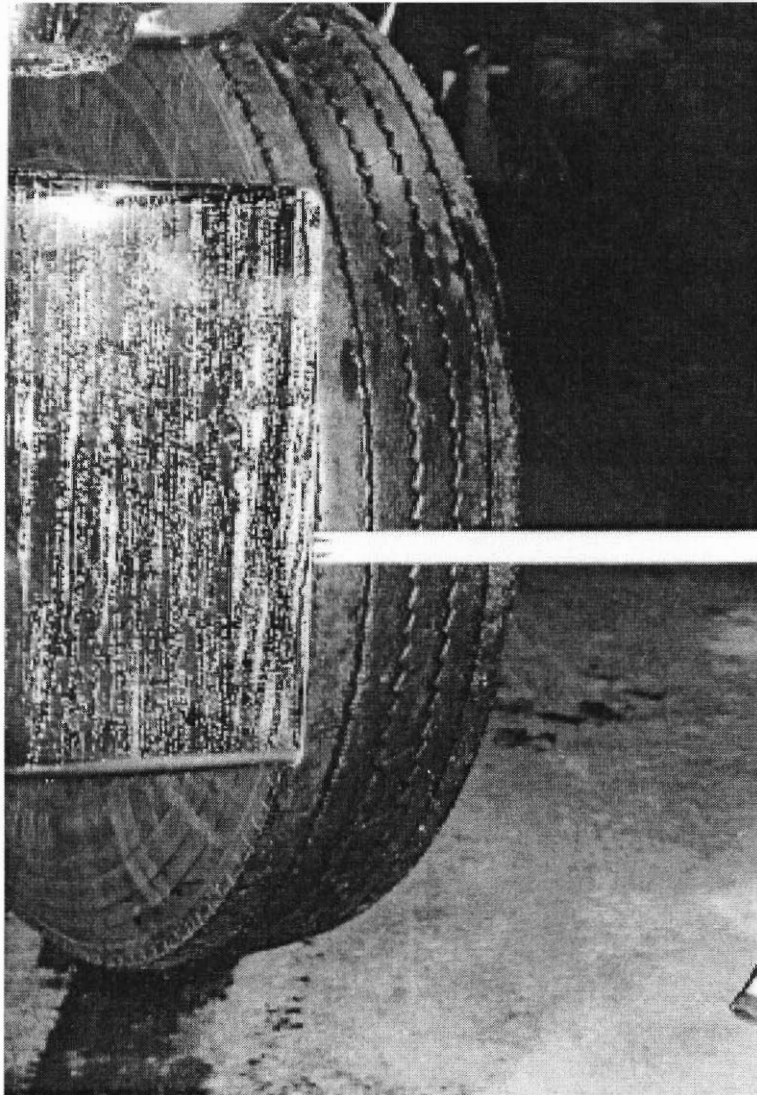


Figure 3-6

It cannot be explained why the driver turned left immediately before the accident, but according to the physical evidence Mr. MacKenzie turned into Ms. Hernandez's lane.

Once the impact had occurred, the tire was forced outward by the bumper. The front right tire is connected to the front left tire by an axle, running under the tractor.

Since the front left tire is steering left it safe to assume. The tractor then rolled off of the car and down to the ground. The tractor then bounced several times. The tractor's brakes then, activated and locked. The tractors front tires were directed to the left, and so the truck turned left, colliding with the guardrail.

The guardrail is made of steel had a rock cliff behind it. This would lead to one to believe that the guardrail would bend very much upon impact. The truck collided with the guardrail with a tremendous force. As a result, the bumper slammed into the back of the tire and the steering system of the tires, forcing it outward even further. At the same time the front tire popped or deflated. When a tire deflates and skids, the tire will leave wider tire mark than an inflated tire, because of loss of pressure. In the picture above the tire marks are considerably wider than the tire marks left in the pictures earlier. This would lead one to believe that the tire was no longer inflated.

Mr. Mackenzie testified that he saw Ms. Hernandez's car a moment before impact. Most likely he tried to apply his brakes when he saw her. Then why did it take until well after the accident for the truck's brakes to activate. It's all a matter of reaction time. The Commercial Driver's License Manual that the tractor's brakes can take up to two seconds to activate after a threat is initially spotted. It will take about 3/4 of a second for your brain to recognize something as a threat. Then it will take another 3/4 of a second for your foot actually to receive the signal from your brain. Once the gas is depressed, it might take the air brakes of the tractors another 1/2 of a second or longer to finally activate. This would explain why the tractors breaks did actually lock up until well after the accident.

3.5 Conclusion

It is the belief of our team that, Mr. Mackenzie crossed the centerline, and caused the accident with Ms. Hernandez. The marks left on the road, the damage to the tractor, and the damage done to the car. The damage done to the car represents a tractor driving up and over the car. Also, the car damage was such that the tractor had to hit the car at an angle. There are only two ways this phenomenon could occur. One, if Ms. Hernandez skidded into the tractor. Ms Hernandez did not skid because there were not any skid marks before the accident. The second and more probable theory, is Mr. Mackenzie turned into Ms. Hernandez.

The damage done to the tractor supports this theory as well. The tractor slammed into the guardrail. The only reasonable explanation one could determine was if the bumper smashed behind the tire and caused damage to the steering system. The only way that could occur is if the Tractors tire were turned left, steering Mr. Mackenzie into Ms. Hernandez's car.

The most confusing and important evidence came from the markings from the road. As seen above, both the defense and the plaintiff both maintain that the gigantic tire mark is the where the truck had first landed after the collision. There is a difference in how the landing occurred, but it is the landing point. It is also, very close and even on the centerline. From physics, and the tractor riding up onto the cars hood we determined that the tractor hit Ms. Hernandez's car and displaced to the left. Since, the tire mark is on the centerline. It is safe to conclude that the tractor hit the car in the wrong. The tractor then was lifted and displaced to the right landing on the southbound side of the

centerline. The white scrape marks of where the undercarriage of the car slammed into the ground are all several inches into the Northbound lane.

Therefore, I maintain the Ms. Hernandez was in the proper lane at the time of the accident. Though she was only a few inches away from the centerline, she did not cross the center line. I also maintain, that for some unexplainable reason, Mr. Mackenzie lost control of the truck. He then steered into Ms. Hernandez's lane, causing the accident that lead to the death of Ms. Hernandez.

Chapter 4: Lopez vs. Encore Wire Co., MGS Manufacturing Inc. and EWC Leasing Co.

4.1 Background

On December 10th, 1997, Hector Lopez was performing work under the direction and supervision of Encore Wire Co. Job of Lopez was to run a winding machine, which is designed, manufactured and sold by MGS Manufacturing Inc. and purchased from EWC Leasing. Lopez was spooling scrap wires that would be sold in a relatively low price by Encore. When Lopez was reaching behind the rewinding machine to clean the scraps he was violently entangled in the machine. The accident caused multiple injuries on Lopez's head, neck and upper body, further more the death of Hector Lopez. At the time of his death, Lopez was husband a father of a three year old child.

This fatal accident brought a liability lawsuit against the employer, Encore Wire, for failing to provide a safe workplace. MGS Manufacturing Inc. is charged for its negligence in designing and manufacturing the rewinding machine. Under strict liability theory, EWC Leasing is charged for selling a defective and dangerous product.

This project team studied available materials on Lopez case, including depositions, product reports and exhibit diagrams. After a detailed case analysis, the team members are able to identify key elements that caused the death of Hector Lopez. The project team then identifies the responsible parties for this case.

4.2 Documents and Reports from Encore Wire and MGS

Both Encore and MGS had been appeared at court for safety related cases before the death of Lopez. For many years, OSHA and Texas Workers Compensation Commission had identified Encore as an Extra Hazardous Employer, and requested safety review from Encore in the year of 1996. MGS is also found responsible for a fatal accident related to its rewinding machine several years before the Lopez incident.

4.2.1 Encore Safety Inspections and Safety Programs

On July 3rd, 1996, Encore Wire Company is ordered to join the Extra Hazardous Employer Program by Texas Workers Compensation Commission (TWCC). As a part of the program, Encore is required to complete a Safety Review and an Accident Prevention Plan by a time line.

In the same year, OSHA requested a complete Machine Safety Inspection in Encore. By the end of the inspection, Encore found many hazardous conditions under which the machines were running, such as no yellow warning signs for possible danger, lack of guarding systems around dangerous machines. Encore is ordered to using yellow warning signs and safety guarding for all hazardous machinery. These action items was scheduled to be completed by February 1997 which is about ten months before the death

of Lopez. OSHA warned Encore that: it is the employer's responsibility to provide a workplace free on known hazards that are causing or likely to cause serious injuries to its employees, and Encore must give safe operation instructions to its machine operators.

To meet these requirements and to enforce the safety program, on August 19, 1996, Encore President Vincent Rego addressed to all the employees: "All members of the Safety Committee have unlimited authority to correct any unsafe condition they observe immediately. This means full authority to shut down any unit until the problem is corrected." It sounds like a very serious managerial program enforced from the highest level of the company. If Encore did force this Safety Program step by step then the possible cause of the death of Lopez would be passed to MGS and EWC for the product liability. It is very important for the jury to understand that if Encore provided a reasonable safe workplace at the time of the fatality.

4.2.2 The Rewinding Machine and Supplements form MGS

The rewinding machine system designed and manufactured by MGS has two parts:

- Item 1: MGS 72" shaftless payout with push button control from either of two stations for lifting, lowering, opening and closing. Equipment includes a caliper and disc air break, dual horizontal arm drives and break control.
- Item 2: MGS takeup machine with a stationary control panel, traverse mechanism and precision counter.

The takeup and payout together forms a wire rewinding machine system. They are only designed for wire or cable rewinding purposes. The operator would string the cable from the payoff to the takeup. He would set one level of the counter to required length and the other level to a predetermined length short of the first setting. He would then start the line and accelerate to an appropriate speed. (See Figure 4-1 for machine set-up schematics.)

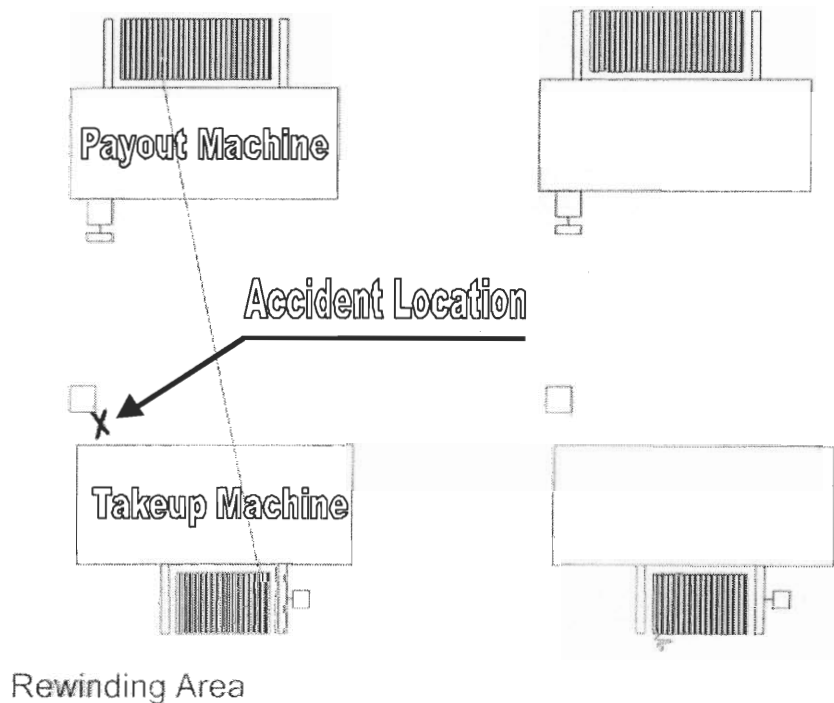


Figure 4-1: Takeup and Payout Machines

MGS did provide some instructions and warnings along with the purchase of the two parts. While examining the Installation Manual, the project team found the following highlights:

- It is the user's responsibility to insure correct and safe machine installation.
- It is recommended that a Safety Zone be set up encompassing the machine.

- Prior to operating the machine, the operator must read and understand this manual.
- Brake Release – red illuminated push button. Press once to manually release the spindle brake, press again to reengage the break. Whenever the brake is applied, the red light will be lit. The spindle brake automatically releases when jogging or running.
- E-Stop (Emergency Stop) is the mushroom shaped red button on the control panel.
- Keep hands and feet clear while moving lift arms. Use extreme care while jogging drive arm for drive pin alignment.
- Check the surrounding area to ensure that all personnel are clear and that it is safe to operate the machine.
- Sudden release of line tension could cause product to lash. Release line tension carefully and secure product.
- Inspect machine at each shift change. Do not operate a machine with damaged or inoperative safety equipment.

Above listed items from the manual gives a safety guideline to MGS's customers for using the rewinding machine. It seems the safety instructions are given properly. But recall the first list item. MGS leave the responsibility of ensuring safe operation to its customers or users. Under the theory of negligence, it is not acceptable by the law of product liability. MGS must have full responsibility of its product safety operation.

MGS did warn Encore possible dangers of the machine under certain conditions, such as keep hands away from the running machine, release of the line tension could cause lashing. It appears to the project team that Hector Lopez did not follow the instructions before his death. Did Encore provide reasonable safety training? Did Encore instruct machine operators the safe procedure of using the machine? And, did MGS foresee the potential use and danger of spooling wires using the machine? To answer these questions we have to examine the depositions from the engineers and employees of MGS and Encore.

4.3 Depositions

4.3.1 Depositions from Encore Wire Employees

Deposition of Olegario Silva

Olegario Silva is a regular employee and machine operator in Encore Wire. At the time of his deposition, he had been working in Encore for eight months. Olegario operates various machines in encore including the rewinding machine. After Hector Lopez's death, Silva became the "regular operator" at rewinding machine #2, which entangled Lopez. Silva states that he has been trained to operate the machine by other operators. He refers the E-button as the "stop button," and did not know the function of emergency stop. Obviously, Encore did not give Silva a thorough safety instruction on this rewinding machine. Silva recalled the day of the accident: Lopez was spooling scrap wire, and he was the only operator working at the area for his shift. No safety supervision was present at the time. At the time of the accident, Silva saw Lopez was entangled and turning inside of the reel. Other employees were puzzled by the accident and did not know how to act in that situation. Finally, the E-Stop was pushed by employee "Shorty", but it was too late. After the accident, Silva and other machine operators did not receive any notice or information on the causes of Lopez's death.

Silva's deposition is relatively short, but it contains essential material on Encore's Employee Safety Program. Based on the deposition, this project team feels that Encore failed to prove a safe workplace according to the following evidences from the deposition:

- Encore failed to educate its employees on safe operations for rewinding machines.
- Encore failed to provide reasonable supervisions under extremely hazardous working condition.
- Encore knowingly and willfully put its employees in extreme danger by spooling scrap wire from the floor.

Deposition of Billy Alley

Billy Alley has been with Encore for four years. At the time of the accident, he was the Plant Manager. Alley stated that it was the takeup machine killed Lopez. The takeup had been in Encore for more than three years and all maintenance were done by Encore. Therefore, Encore became responsible for the machine inspection according to Alley's statement.

About ninety percent of the machine shop employees have Hispanic ethnic background, and only nine percent of them speak and understand English. How could the other ninety one percent of the Hispanics possibly even read or understand the machine operation manuals? Obviously, Encore concerned about the cost of labor in the business,

and the Mexicans would work for low wages. The project team feels that Encore puts the cash flow problem before its employees safety. It is morally unacceptable.

At the time of the accident, Alley was working on an area where is relatively far from Lopez's machine. He had four supervisors under his management in that shift. He could not get immediate communication from other employees at the time of the accident, because he was far away from the site. By the time Alley reached rewinding machine, every thing already happened. When Alley reached the control panel with the E-Stop button, no other employee was spotted within the switch control area. At this part of the deposition, the project team became outrageously puzzled about the way people reacted in a life and death situation. Why did not the others react to push the E-Stop in the very beginning of the accident? Why were Alley and "Shorty" the only ones seem to know to stop the machine, while precisely five supervisors were working the shift? It became clear to the project team that Encore did not train its employees on how to react in the case of emergency. Encore also failed to provide reasonable communication devices for the case of emergency. Furthermore, proper supervision was not presented to ensure the safety of the employees in Encore.

Alley described that after the accident there was no wire on the ground. It was all wrapped back up on the reel. By being caught, the wire and Lopez's body went back to the reel, and essentially the wire rolled back up on the reel instead of coming off. After the E-Stop button was pushed, the reel continued to rotate, because it was driven by a gear box which does not stop. Alley said that the E-Stop was the fastest way to stop the

machine. There was no safety director in the machine shop of Encore. This part of the deposition, Alley pointed that the E-Stop did not stop immediately after it was pushed. According to MGS, the E-Stop is a safety device. However the E-Stop seems to be negligence in design for immediate emergency stop function. If that is true, MGS could face two counts of product liability charges: first, the negligence in design and manufacturing the E-Stop, and the second, the breach of warranty for its expressed function of being immediate stop device.

In the end, Alley told that Encore placed a jog pedal or deadman switch on the machine after the accident and no operator was allowed to leave the machine without turning it off.

In conclusion of Alley's deposition, the project team found the following facts:

- Encore failed to post warning signs.
- Encore failed to install proper safety control devices.
- Encore failed to disengage the machine at the time of the accident.
- Encore failed to provide emergency training to its employees.
- MGS failed to provide a safety device on its machine.

Deposition of Garry Bliss

Gary Bliss was the plant manager for Encore Wire at the time of the accident. Mr. Bliss did not witness the accident. He was summoned some time after the accident

had already happened. He stated that Carlos Jaun Diego was the man who witnessed the accident. Carlos had seen Hector Lopez get caught in the machine. Carlos ran over and pushed the E-Stop button. Mr. Diego then told Gary Bliss that the machine revolved three more times with Mr. Lopez in it.

Mr. Bliss stated that it was against company policy for anyone to go around to the front of the machine. He also stated that there wasn't any actual written policy. The witness also did not offer any proof of Mr. Lopez ever knew that rule. In fact, Mr. Bliss and Encore Wire could not prove that Mr. Lopez had actually been trained on how to use the take-up machine.

At the time of the accident, Mr. Lopez had been operating the take-up machine to scrap wire. Encore Wire knew of two ways to scrap wire. The first involved, actually pulling the wire off by hand. The second involved the take up machine. In order to scrap wire on a take-up, one must allow the wire to pour onto the floor. Gary Bliss stated that one could not allow a lot of wire to pour onto the floor, because the wire would start to lash and tangle. The employees were instructed to cut the wire after the machine had been shut off. There was not a written procedure on how to use the take-up to scrap wire; the company had developed this method after acquiring the take-up machine. It is questionable that Mr. Lopez understood how to operate the take-up to scrap wire and the danger it posed to the user. Mr. Lopez had been caught several times walking around to the front of the machine, and cutting the wire while the take up was still running.

Gary Bliss and some other employee's had made some modifications to the machine before and after the accident. Before the accident, the wire counter had broken for the rewind machine. Encore had rigged the machine, so the rewind machines could

work with another rewind machine's counter. After the accident, Gary and another worker modified the E-stop button on the rewind machine, so it will stop the electric motor. Originally the E-stop shut down the hydraulics which allowed the machine to coast to a stop. Shutting off the engine would make the reel stop quicker.

OSHA visited the company after the accident and recommended several modifications. Mr. Bliss supervised the modifications to the plant. First they installed 'deadman' switches on the take-ups. The 'deadman' switch would 'kill' the machine, or stop the machine immediately.

4.3.2 Depositions from MGS

Deposition of William Gurecki

William Gurecki joined MGS in 1981. Gurecki now is the Vice President of Engineering Department in MGS, and he was also the Vice President of Operation Department in MGS before. In his deposition, Gurecki told that the engineering department gave safety corrections in design in MGS, since MGS did not have a Safety Department. He was involved in the electrical design of the takeup and payoff machines.

The order placed by Encore was to provide two new traverse assemblies for each of the two takeups and provide electric for the second machine. The system in Encore consists of a single payout machine and two takeup machines. After the installation was

done in Encore, MGS provided a machine training to only one operator in Encore. No supplemental materials including operation instructions were provided at that time. Before the Lopez accident, MGS did not install any warning labels on the machines. After the accident, MGS installed the warning labels and began to use a safety interlock switch on a lot of their equipment which would actually latch the doors closed on a particular machine until the machine come to a complete stop.

According to Gurecki, in the summer of 1997 just months before the death of Lopez, MGS started a Hazard Assessment, it was the first time the company had done it. However, the engineers actually designed and manufactured the machines hardly have any sort of communications to the safety personnel within MGS. The during the assessment design engineers did notice that additional warning labeling should be added to the payout and takeup machines to enhance the various possible pinch points and other dangerous portions of the machine. Design engineers also identified possible hazards on the machines. However, all of these information were not noticed by MGS nor by its customers.

The original design to meet Encore's specifications was to have the operator's station connected to a single electrical panel, which is connected to the counter assembly, which had connections back to the single payout. Therefore, the operator could run the wire from a payout reel, through the counter onto one side of the takeup. Upon completion of the footage, the traverse was to move over to the other side, at which the operator have prepared another wheel to run on the left side, and the traverse would

come over and begin running in that spool. In the meantime, the operator could unload the full spool and load another spool onto the right side. The counter measures the footage of the material passing through it and also provides a signal to the control panel to maintain a constant speed. The machine would not run if there is nothing going through the counter. Note: Encore was using only the takeup to spool wire, the counter was not involved. Therefore, Encore must have changed the original design setting of the machine. (See Figure 4-2, two terminals have been short wired.)

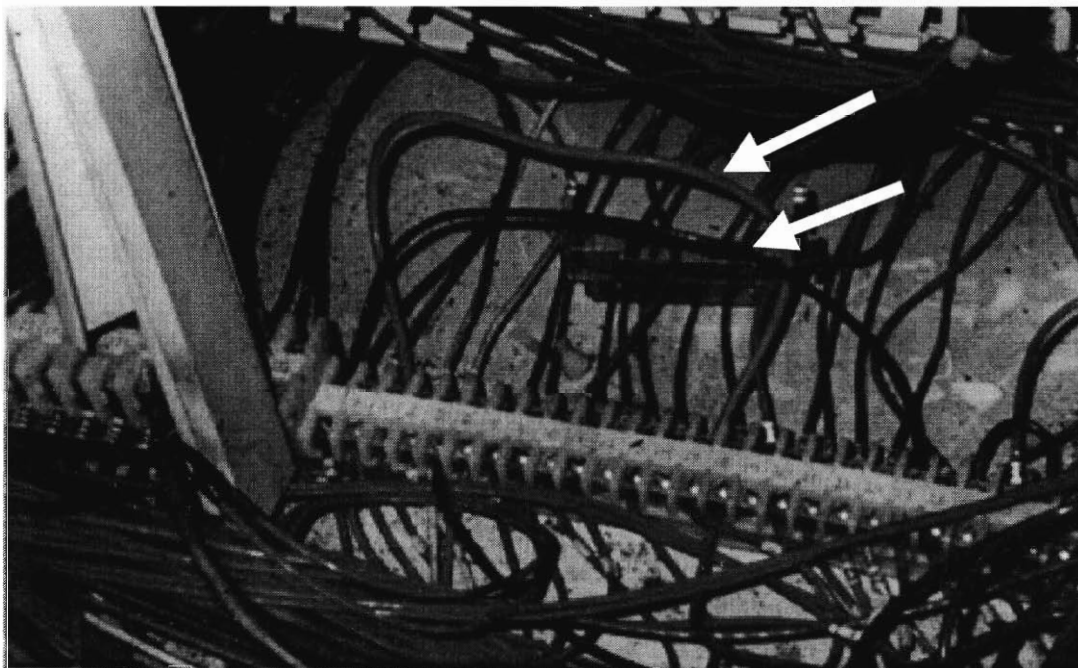


Figure 4-2: Two Terminals Have Been Short Wired on the Set-up Panel

(Encore has changed the original electrical set-up for dangerous unspooling function.)

MGS classified a deadman switch as an optional feature for the product. It is up to its customers to place the special order for a deadman switch. MGS did not provide any written instructions or procedures to Encore that addressed the proper procedure to use for getting a loop out of a spool. MGS engineers had some ideas on Encore using the

takeup to spool scrap wires, but did not recommend any proper set-up for the machine or give any warning. There was no break located on the takeup and no warnings on unspooling wire. A jogging panel was not installed because the engineers thought that would be too much on the way for the operation.

Only after the fatal accident, MGS put warnings on the machine in Encore and a cable pull and a jogging panel was placed on the takeup end and front of payout. However, these safety devices were only given to Encore, they were not installed to other machines sold to various previous customers of MGS. Potential dangers of these machines still exist in some other places.

Upon the completion of this deposition the project team identified many preventable hazards that could be eliminated by MGS's engineers. There are listed as follow:

- MGS knowingly and willfully designed and marketed an unsafe product.
- MGS failed to install a safety device to its machine.
- MGS failed to provide proper instruction for its product.
- MGS knowingly and willfully supplied Encore a product that was not intended for its original use.
- MGS failed to inform its customer about the extreme dangers of using the product.
- MGS knowingly and willfully provided a defective safety control system.

- Encore knowingly and willfully changed the proper setup of the rewinding machine for a extremely dangerous operation.

Deposition of Dean Williams

Dean Williams had been the original designer of the line of take-ups in question, for MGS. He stated that the take-ups he designed for MGS; were based on the designs he had used at other companies, before working for MGS. Mr. Williams stated that safety was left up to the request of the customer. He, nor MGS, did anything special in regards to safety outside the limits of the order placed by the customer.

Dean Williams stated that in past years he had added safety devices requested that by companies that were not put on other take-ups going out to other customers. Mr. Williams acknowledged that getting caught in the reel was an extreme hazard in take-ups and that he did nothing while working at MGS to ensure safety in that area. Mr. Williams stated that he was aware of one other accident where a man had been caught in tangled wire and was killed by a take-up machine. The machine involved was one of his designs from another company. The rumor was that the operator was using the take-up to take wire off a reel. Similar to the accident that killed Mr. Lopez. Mr. Williams admitted that he did not use this information in any way to modify his design.

Mr. Williams stated that using the take-up to take wire off a reel was a very unsafe and unwise idea. Mr. Williams believed it could lead to entanglement of the operator as to much wire accumulated onto the ground. He believed that if the operator

were to be entangled in the take-up, the operator could quite possibly die. He stated that there were not any warning labels in the manual or on the machine, to warn that it was not the proper function of the take-up to unwind wire from a reel. The operator of the machine had no way of knowing that de-spooling a reel in a take-up was a dangerous and in-proper use of the machine. Mr. Williams then admitted to the fact that the addition of a 'deadman' switch or a light barrier could have possibly prevent the accident that lead to the death of Mr. Lopez.

4.4 Product Liability Analysis

4.4.1 Analysis on Encore Wire

Solid evidences show that Encore has been a major party that holds absolute responsibility for the death of Hector Lopez. Encore did not have any concern or action for the sake of its employees' lives. The management in Encore failed to provide and enforce an employee safety plan. Managerial personnel in Encore foresaw the extreme danger of spooling wire from shop floor, but they failed to stop the action and even failed to give proper warnings. The percentage of properly trained operators in Encore is extremely low and unacceptable by all standards. Encore also changed the designed set up for the rewinding machine, and that created a hazardous condition for its operator. Encore did not provide minimum supervision for its employees. Encore put its financial income before its employee's lives and that is morally wrong. Under strict liability and negligence theories, Encore has contributed significantly for the death of Hector Lopez. If Encore had followed OSHA safety standards since the purchase of the rewinding machine, Hector Lopez would not be killed.

4.4.2 Analysis on MGS

The MGS in fact has designed and manufactured a defective product. The rewinding machine failed to provide any safety device to stop the reel. A deadman switch is a safety device and should not be an optional feature for the product. The engineers in MGS foresaw the danger and hazards presented to its machine users, but they failed to warn them. The engineers in MGS also foresaw the potential use of the machine as to unspool wire, but they did not make any safety adjustment in the design for that use. Within the corporation, MGS did not have a product safety plan in designing and manufacturing. MGS was irresponsible on distributions and installations of its product during post sale period. The machine designed and manufactured by MGS is an unsafe defective product. Under the theories of strict liability, negligence and breach of warranty, the project team found MGS is reliable for the death of Hector Lopez.

4.4.3 Analysis on EWC

In this case, EWC was nearly mentioned in the depositions. The role of EWC was a distribution media for selling winding machine to Encore. Under the theory of strict liability, EWC is involved in selling a dangerous and defective product to a party, therefore EWC is also reliable for the death of Hector Lopez.

4.5 Case Conclusion

Upon the completion of the Lopez case, the project team found that the causes for Hector Lopez's death are:

- Encore did not provide a reasonable safe working place.
- Encore knowingly and willfully put its employees in danger.
- Encore failed to provide safety training to its employees.
- Encore created a hazardous condition for its employees.
- MGS designed and manufactured a defective product.
- MGS was irresponsible for its customers.
- MGS failed to provide a safety device on the product.
- MGS failed to install warning labels on the machine.
- EWC helped MGS marketed a dangerous and defective product.
- All of the three companies are liable for the death of Hector Lopez.

Chapter 5: Mock Trial

The IQP presentation in Products Liability took place on May 2, 1999. At the presentation, students involved in the IQP presented Hernandez vs. Mackenzie and Lopez case before a jury. Several groups were assigned the task to present the two cases. Our group was involved in presenting Hernandez vs. Mackenzie the jury. We then were given the opportunity to listen to other groups present on both cases. After listening to the opinions of our fellow engineers we decided that we correct in our original opinions. The jury was then instructed to make a verdict in the case. In regards to Hernandez vs. Mackenzie, the jury agreed awarded money to the plaintiff's family of 750,000 dollars. In the Lopez case the jury awarded the plaintiff a sum of 5,000,000 dollars.

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