# PRODUCT LIABILITY: An In Depth Study

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# ABSTRACT

This project studies the principal aspects of product liability law, and the fundamentals of product safety with regards to alleged defects in a heat gun, a table saw and a crane. Plaintiffs sustained serious injuries, property loss, and in one case death from these alleged defects. From the viewpoint of an engineer, opinions will be developed on each case based on standards, depositions, expert witnesses and complaints. With these opinions in mind, decisions will be made regarding the party at fault for the cause of the accidents.

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# 1. VIDEOS

We began our study of products liability by watching nine videos. These videos showed from beginning to end what a trial would be like for an engineer giving an expert opinion. Each of the nine videos was used to illustrate a different aspect of the trial.

### 1.1: The Opening Statement

This video examines two opening statements and critiques the lawyer's performance in each. In the first opening statement, Leonard DeKroft presents the case of Kelly vs. Admiral Realty. He presents his case well from early in the opening statement by making clear who was involved in the case, and where and when it took place. He makes the jury think about seeing the world through the eyes of an eight-year-old boy, and to think about the three specific boys in this case. He describes in great detail the events of the tragic day that Chris Kelly was crushed in the gravel pit owned by Admiral Realty and operated by DeLorenzo Construction. He also tells how Chris died: slowly suffocating, which must have been terrifying.

He also goes on to tell the jury what he intends to prove and what the defense intends to prove. He explains the term attractive nuisance to a jury; a term they must understand for this case. He then goes on to talk about what the defense intends to prove; he does this to discount their claims early in the trial. He tells the jury that Admiral Realty neglected the gravel pit for years, and that the pit had been dug at an angle too steep to remain safe, making it a matter of time before it collapsed. It was a tragedy that a life had to be lost when that time came.

The second opening statement examined was a case that took place in Miami, Florida. The case involves a child hit by a truck while walking home from school. It is interesting that this opening statement was made from behind the podium, as to not intimidate the jury. The lawyer goes on to explain the details of the case to begin his statement. He describes the accident scene in great detail to paint a picture in the jury's minds. He tells of Little Stevie walking home after school about 3:15. As he was walking across the street, which was approximately ten feet wide, a one and a half ton truck hit Stevie. He

uses a pad of paper to draw a picture of how the accident occurred to help the jury better picture the scene.

Both witnesses to the scene describe similar scenes. The driver, while driving less than 20 miles per hour, took no evasive action and hit Stevie. The lawyer says that because of this the driver must be punished.

After this the lawyer describes the injuries Stevie sustained. Immediately following the accident Stevie was knocked out and taken to the hospital. An operation had to be preformed in which a piece of Stevie's brain tissue was removed. Stevie was in a coma for two days before he woke up. Since the accident Stevie has had a major personality change and is susceptible to seizures. He will be on medication for the rest of his life because of the negligence of a truck driver.

### 1.2: Direct Examination

The easiest part of a trial seems to be direct examination because the lawyer has had time to prepare his witness and has control. In reality the direct examination is the hardest part of the trial because it calls for the most organization and control of the witness on the stand.

The jury is comprised of normal people from society. As 'regular' people, we tend to best remember what we hear first and last. Therefore the most significant information should be presented at the beginning and end of the direct examination, as the jury is limited by their attention span. Often there are many technical facts in which most people are not interested. As a result, they get bored and start to lose their concentration. The lawyer must give them the necessary information and conclude with something of significance that will impact their memory. When engineers are called up to the stand to explain their work, the jury's attention span may not hold up through the key facts.

In this video we saw a woman whose hand was squeezed between two rollers at an industrial manufacturing plant. After this accident she was unable to work. Leonard Decaug, the trial lawyer from Providence Rhode Island, starts by interrogating the economist. This economist has come up with his figures for Ms. Riley's net loss since the

accident. The lawyer controls the content, and therefore controls the witness. There is extreme organization: perfectly planned and thought out well beforehand.

The lawyer starts by introducing the economist. He projects the economist as a well-skilled economist who is a professor at many top universities in the United States and is well published in many economists' magazines. Outside of teaching he was a consultant to foreign governments, world banks, the state of Connecticut, and the Commonwealth of Massachusetts in the field of economics demonstrating that he is a well-skilled economist with a lot of education and experience.

Mr. Decaug calculated the net loss of Ms. Riley since she was injured, a figure that the examining attorney questions steps down to the blackboard to show the calculations to get these figures. He does some simple math on the blackboard in front of the jury, mentioning a study by the Spinal Cord Research Facility in Phoenix, Arizona for the paraplegics, which says a certain percentage could not go back into their profession. He then states all his other numbers and where he obtained them, stating each time that his sources are widely accepted tables that economists use.

Even with something as simple as writing equations on the blackboard, there are ways lawyers can alter or hide some of the evidence. The blackboard can sometimes hide the facts from the jury simply because of where the witness and the lawyer stand. They can hide some figures, not allowing the jury to see the entire blackboard. In this case the witness and lawyer are standing in close proximity to each other; they may also lower their voice, making it hard for the jury, some 20 feet away, to hear some important points that they do not want the jury to hear. An alternate method of displaying their work is a piece of paper on an easel. This way the paper becomes an exhibit, which can be later taken into the jury room. These options are up the lawyer and what he or she decides is best for the case.

In the next part of the trial, the lawyer asks more involved questions regarding the details of Mr. Decaug's calculations. The engineer cites the table he got it from and the lawyer repeatedly asks if these are recognized standard tables in his field of profession. This technique of repetition is commonly used to drill facts into the jury's head.

He concluded with Mr. Decaug saying directly that the plaintiff was going to have projected wage loss of what he has just proved on the blackboard. This is what the point

of his argument was and was first said at the beginning.

When the plaintiff comes up to the stand, the lawyer dramatically changes tone. He is no longer exchanging ideas with the witness, but is more active in drawing the jury's attention to him more than the ideas of the plaintiff. He talks more, controlling the content. He also wants to get the jury to know her personality. He fires questions at her a lot more quickly than at the engineer. He asks redundant questions as if she were not as intelligent as the economist that was previously on the stand.

The exhibits that are presented in a court case break up the flow of the lawyer's speech. It is important for the lawyer to set up the exhibits beforehand to make it look very professional. It would make a bad impression on the jury if the lawyer were fumbling around trying to arrange all the exhibits.

The lawyer asks many questions about the plaintiff's knowledge of the machine in question. Instead of asking a general question about whether she knew how to operate the machine, he made incremental steps as asking: Did you know how to turn the machine on? Did you know how to turn the machine off? Did you anyone tell you anything about that machine? Have you ever used that machine before? The information conveyed to the jury is the same; however, this way more time is spent using repetition hopefully allowing the jury to remember the testimony.

Because of the problem of losing the jury's attention, the lawyer has to come up with unique ways to keep their interest. When he introduces his main fact - that this machine had no guard - he made sure to get the attention back from the jury by introducing it with: "Now Linda, this is very important, (paused) was there any kind of guard or barrier in front of those rollers to stop your hand from going into the machine?". By saying the name of the person on the stand, and implying his next question is very important, he recaptures the jury's attention by making them wait upon his next *important* question.

The lawyer then goes into the brief detail about her eleven operations. He wants the jury to feel sympathy for her pain and suffering. He goes through all the things she can no longer do, such as every day activities people take for granted. He makes her so upset that she starts to cry. The jury can surely feel her pain and suffering at this very emotional point in the trial. The lawyer shifts gears, focusing on what she wanted to do

for a career in high school, and points out how she can no longer do that. He ends by asking her to step down to the jury and show her hand hoping to disgust the jury. He does this last because he hopes to have the jury remember most what they had seen last. Any further questioning would have not been as effective. Her hand was hard for the jury to look at because of its mangled formation.

### 1.3: Additional Opening Statements

The third video we watched was about the opening statement should be a strong statement that introduces the theme of the case as well as stimulates the jury's curiosity in the case. In this particular video the lawyer tries to make the jury interested in why this particular accident occurred.

The defense lawyer is shown first in this video. The defense lawyer introduces his defendant, Al Duke, as an ordinary guy. He says something has changed him and tells the jury that it is their job as jury members to investigate the situation. He does not explain what has happened yet, stimulating the jury's curiosity in the case ahead. He tells them he will ask the questions that he thinks the jury wants to know the answers to, effectively establishing a one-on-one relationship between himself and the jury in hopes the jury thinks this lawyer is on "their side" right from the start.

He begins explaining the story: Al Duke was a happy, independent steel worker who climbed buildings, bridges, etc every day. He was happy with his job. Finally the lawyer goes into the case, which focuses on the hoist that hoisted material up the outside of a building they were working on that had failed. The case is about the quality or the reliability of that particular machine. The owner of the hoist had leased it to the workers of this construction job. He explains how the hoist was manufactured to hold 2500 pounds and explains that the construction workers were in fact lifting less than 2000 pounds when the hoist failed and started to free fall. This gives the jury the sense of his honesty in telling them something that may actually hurt his defensive case.

Next, the plaintiff's lawyer, Leonard Decaug gives his opening statement. His approach is to explain how the hoist worked: not with a technical explanation but by using common knowledge to explain how the hoist worked. He uses many simple hand

gestures to show that the operation of this lift was not hard to grasp. Once again, he was not yet explaining any of the technical aspects of it. This is important because the jury can directly understand this with no explanation from experts. He is explaining how the lift failed simply using common sense of how a hoist should operate.

Next some of the details of the accident unfold. The construction workers would hoist large metal beams to the top of the building because it was the only way to get them up there. The construction workers were sitting on top of the beams. As the hoist reached the 4$^{th}$ floor the hoist suddenly began to fall. A man by the name of Mr. Stern was the one controlling the hoist. The manufacturer purposely put a fail-safe device on the hoist in the case the operator died or was unable to control the hoist and took his hands off the control. The operator tried to pull on the brake, and when that wasn't successful he became frightened and ran out of the cabin used to control the hoist. The fail-safe device never was activated because the operator never took his hands off the brake. The platform came crashing to the ground, mangling Al Duke's leg, which resulted in amputation. The defense will argue that it is Mr. Stern's fault because the fail safe device did work but was not activated because the operator was still operating the hoist. The defense will also try to say there should not have been workers riding on the platform, as there was a sign on the machine warning there should be no working riding on the platform. However, the lawyer mentions how his opponent Mr. Decaug is going to try to argue that it is the hoist's fault for failing despite having the workers ride on the platform. He clearly states the other side's stance; because it is quite evident being they are the plaintiffs in the case.

Leonard Decaug also tries to get the jury to recognize and become familiar with his personality. He describes Al Duke not to be the kind of person to be content with lying in bed, being unemployed. Instead, he characterized Al Duke as a courageous man trying to get other jobs that he can handle with only one leg, but still makes it obvious he still has an extremely hard time maintaining a decent job. He talks about the difference between the way Al Duke was before the accident, and the way Al Duke is now. He says he needs to determine this in order to make a good and adequate compensation estimate. Also note how Leonard Decaug also does not state a precise amount that Al Duke lost because of this accident. While some courts do not allow this dollar amount; in this case the lawyer decided it was not appropriate.

Another opening statement from a completely unrelated case was presented in this video. This case was a case against an injury with a little boy and a baseball-pitching machine. There was an arm that was wound up by a spring. The machine was operated by electricity; however, in this case it was not on, not plugged in. The boy brushed up against the machine, which shook the spring loose causing the arm to let go and hit him in the head. He had to be rushed to the hospital.

The lawyer spent a lot of time showing his plaintiff was an innocent victim. That was to avoid the jury members thinking he may have walked into this dangerous situation. This is a good technique for the lawyer to present the facts to the jury from the protagonist's point of view.

In this opening statement the lawyer initially runs through the overview of the story. Then he starts over, and goes into the details. He starts with the machine. He shows how the springs can still be loaded up even after it is shut off. The company knew about this years ago and there is a very simple remedy for it; to add a guard. In the opening statement he goes into how the company ignored the fact that their product was dangerous and instead of offering guards to previous owners or large scale advertising of these dangers, they used small scale advertising of a new product and offered a guard for an additional cost of $45.00, never mentioning the dangers of the machine without this guard. He also makes it clear that other people have had injuries and even lawsuits with his machine showing consumer reports that have been published showing this machine is in fact, dangerous.

The lawyer mentions how the boy made what doctors thought was a remarkable recovery, showing that the boy was happy to be getting better and that he had a positive attitude; he was not intentionally looking for a lawsuit. Surprisingly after an entire year he receives more bad news when it was found that while the boy has minor difficulties using his left side of his body and that he is "unaware" of his left side. The lawyer then gives a brief description of what this means, and many doctors will come in to help explain difficult fact. He mentions the doctor's will be explaining this "for us to learn together," as it is a difficult concept to grasp and that even he, the lawyer, has a hard time understanding what is wrong with the boy. This effectively makes the doctor part of the jury, on their side. The lawyer also says that this will become much more serious later in

life. He says the young man will walk into the courtroom and no one will realize anything is wrong with him. He makes sure to note that while it is not obvious upon first inspection, the boy does have serious injuries. This creates a general curiosity from the jury. They will be waiting to see how the boy looks, and then they will be interested in finding out what is wrong with him. This is all, of course, in hopes of determining the baseball pitching machine is at fault for his injuries.

The lawyer tries to explain himself in simple terms; how it is possible for the boy to be "unaware" he has a left side. He says the boy knew, but never told anyone because no one had asked and he was unaware that this was not normal. He introduces this in the opening statement because it is a hard subject for the jury to understand.

At the end of his opening statement lists the experts that will explain the technical aspects of the case. When the lawyer reminds the jury that the boy failed out of school we see the technique of rhetorical phrases to emphasize the subject, where each sentence gets more and more harsh. At first he goes into how his grades started to slip and then ends with how he dropped out of school. He then concludes with strong words, there will be compensatory and punitive damages.

The opening statements in each one of these cases show how the case is introduced, and immediately shows the different opinions of the plaintiff and defendant. It is quickly noticeable what points each side is planning to describe in further detail throughout the case. In these first few words it is important for the lawyers, both independently and together, to draw the jury's attention to the case stimulating their curiosity to help them pay better attention to the details of the case. It is also the lawyer's first opportunity to make a first impression on the jury, which is extremely important when it comes the verdict.

### 1.4: Cross Examination of Non-Medical Experts

Cross-examination usually brings out a side of the lawyer unseen in their opening statements. Often times a lawyer must be direct and aggressive towards the witness at the stand during a Cross Examination, while in other parts of trials the lawyer may be more patient and try to guide the plaintiff through one step at a time. In a direct examination

the lawyer must be stricter, controlling the witness and the content that is presented to the jury.

In this case Mr. Miller is cross-examining an expert on the stand. He takes his own course of action by using his intimidating size and aggressive personality to his own benefit. He is quite rude in asking the expert on the stand how much he is charging the defense for him to be there testifying for him. This is slightly embarrassing for the defense, as the jury now knows he is simply up on the stand because he was paid a large amount of money. Mr. Miller certainly makes this clear to the jury. He then goes on to asking the expert on the stand how many times he has testified in court. He makes it clear to the jury this expert is very often in court testifying for the defense exactly as he is in this case. Not too many times has he testified for the prosecution. Mr. Miller states that perhaps this is because the defense was pleased with his past performances.

During the course of this examination, Henry Miller asks the expert witness about the location of the notes that he had taken at the scene of the accident. The witness had to explain that he had simply written a few things down that day; and that he had thrown them away. Mr. Miller jumps on this hoping to convince the jury that this expert is not very professional at all and is not well organized. When the expert tried to explain why he had thrown the notes away, Mr. Miller quickly cut him off and told him he had not asked why he had thrown them away, he just wanted to confirm to the jury that he had thrown them away. Mr. Miller defiantly left a convincing mark to the jury that this expert was not professional; hopefully casting doubt on his entire testimony.

Next the video shows another clip which is another technique to re-affirm the physical facts of this case. The lawyer asks many questions and asks if the witness agrees or disagrees with him to re-state all the physical aspects of the case. In this way, the lawyer has control of what he says, and how he says it. The witness must either agree or disagree in one-word answers, leaving no time for explanation. At one point the lawyer says, "And would you further agree with me so there's no dispute and this jury doesn't have to spend an extra second thinking about it". Mr. Miller is attempting to show the jury that he is asking these questions for them, fulfilling the promise he made during the Opening Statement. The jury is the most important group in the courtroom in the eyes of a lawyer. He is attempting to incorporate them directly into his presentation, bringing

their attention back.

The lawyer is not perfect by any means, and he asks questions that produce answers that may not be beneficial to his case. In the next portion of the video, Mr. Miller starts to ask questions about hypothetical designs asking if there are designs that meet minimal building codes but are still dangerous. The expert agrees. The lawyer asks the expert if he agrees that all designs are of minimal building code. The expert disagrees. This disagreement is not what Mr. Miller had been hoping for as a response and therefore quickly interrupts the expert before he can say anything else to take the juries attention off that onto the next question. Any second of silence would allow the jury to think about the last question and the witness's answer.

Another technique Mr. Miller uses are repetitive questions making a statement and seeking affirmation from the witness. He creates a "pattern of response in which he can condition the witness". The witness then falls into a pattern of agreeing

With all the statements he makes at which point the lawyer throws a trick question in hoping the expert witness will keep agreeing as the lawyer gets into more detailed questions. This same hope is for the jury. If the jury keeps hearing the same answer again and again and then the lawyer asks a new question, the jury may just expect the witness to agree. Any second of silence may make the jury realize his actual intended answer.

Mr. Miller finally asks an open-ended question to the expert, usually a dangerous move for a lawyer. What did the landlord do to alert the pedestrian that there were two steps coming ahead? Perhaps the lawyer was expecting the testifier to say nothing; however this expert jumped back and responded with "he relied on standard engineering practice which expects that a person can see the steps visually when he comes to about 8 or 10 feet of it". Mr. Miller then stated that if there were one step it would have been painted by standard engineering procedure. Had there been 3 steps or more, there would have been a handrail, but when there are only 2, as in this case, nothing is done. If the landlord had spent ten dollars to paint a line across the stair then this tragic injury may have never happened. While perhaps a little extreme, he gets his point across and hopefully convinces the jury.

Lawyer Robert Conason starts by asking almost the exact same questions that Mr. Miller had asked in his interrogation. However, this lawyer has a much different

personality than Miller, thereby setting a different mood in the courtroom. He begins his interrogation very calmly with the expert witness on the stand and uses very open-ended questions, allowing the expert to talk quite a bit, unlike the last case. This style will quickly change later in the direct examination where the lawyer regains control of the conversation.

Once again, this lawyer questions how much the defense lawyer is getting paid to testify for the Defense. He details how much work the lawyer actually did, and makes it clear to the jury that for such an expensive salary, this lawyer has not done much research about the case beforehand. He reveals that the expert witness did not go to the scene of the accident, but does not accuse the expert as of yet. He simply asks questions such as "Did you speak to the driver?".

This case involved an accident in which a truck may have been speeding. The truck went by 3 detour signs before the truck driver coming to the site of the accident – a fact that the lawyer emphasized in the courtroom. He held up a picture of each sign, asking if this was the detour sign he had passed. The lawyer paced himself out slowly, and used repetition expressing that the signs were at 1500ft, 1000ft and 500ft.

There were 3 techniques Mr. Conason used in this particular cross-examination. First was the difference in the two speeds he reported the plaintiff was going. At first the expert stated he was traveling at 25mph. The lawyer then had the expert get out his copy of the police report and read to the jury that the driver had told police officers the day of the accident he had been going 30mph. This technique made it seem as if the expert had made a mistake. The second technique was to show his investigation may have been inadequate because of a third speed at which someone reported the truck driver to be traveling. The third technique brings the blame to both the expert and the lawyer when it was revealed the driver had been going 40mph. The lawyer asked the expert "didn't the lawyer tell you about it?". .

Every examination should build to a final conclusion. The cross examination did a very good job of embarrassing the expert because of his lack of knowledge as well as the extraordinary fee he was being paid. He was asked about very well known bridges, the Washington Bridge, the Brooklyn Bridge, etc, and if the road surface was the same on those bridges as it was on the one being questioned. The expert witness said he was not

familiar with these bridges even though he drives over them quite frequently. He concludes his examination by saying, "in reality all you did was take photographs, examine a police report and come in here and testify", a statement to which the witness agrees.

Cross Examination can be a very useful part of the trial. It can be used to modify or destroy your opponent's theory or it can be used to embarrass a witness and show that he/she put in inadequate time and had a poor knowledge of the subject before entering the courtroom, as was the case in this last example.

**1.5: Cross Examination**

This tape goes over several important techniques used in cross-examination. The first of these is the "leading question" or the impression that the examiner desires one answer rather than another. Robert Habish, the attorney for Mr. McObee, uses this technique when talking to the expert witness, Mr. Sweets. Another important technique revolves around the credibility of the expert, seen when Mr. Habish attacks the credibility of the expert, by asking him if he was biased against farmers. After a negative reply, Mr. Habish brings out old articles in which Mr. Sweet states that most accidents are caused by farmers' negligence.

Mr. Habish asks some questions that the jury may be interested in, like why the company did not install the optional guard around the area of the combine, which caused injury to Mr. McObee. Mr. Sweet becomes evasive, and it is very important to keep evasive witnesses under tight reign which is accomplished with short questions which are not open ended. Questions requiring a 'yes' or 'no' answer are ideal for this. Mr. Habish establishes an entire series of contradictions in the testimony of Mr. Sweet before he is finished.

The second case deals with a situation where a man was not cleared to work in a certain area, but did so regardless. He died while on the job, and ACME Aluminum claims it violated no codes. The attorney, JD Lee of Knoxville, Tennessee, establishes the credibility of the expert witness by asking him how long he has been an electrician

and if he had testified before. He also asked if he was acquainted with the work of painters such as W. J. Ottom, who was working in an area with current electricity. Mr. Ottom was working on September 16th on transformer bank number 5 when his shoulder came in contact with 13,800 volts, which killed him.

It is believed that the plaintiff, Acme Aluminum, is responsible for the death of Mr. Ottom, and should be more careful in protecting its workers. All they needed to do was to follow the standard clearance defined in the Code Guidelines, which were adopted by the state of Tennessee en toto. Unfortunately for W.J. Ottom, was neither the dispatcher, operator nor the person receiving clearance, meaning hews not certified to work in the area (i.e., his presence was not known), and no one knew to shut down the power. Mr. Lee uses the expert witness against the defense by establishing through his interrogation that there was in fact a code violation, which implicates the plaintiff, ACME Aluminum.

**1.6: Deposition**

Depositions are not held in the courtroom, but in a conference room. The only people present are lawyers from each side, a scribe, and the person giving the deposition. During the deposition, the deponent person giving the deposition is under oath. There are several important guidelines to follow when giving a deposition: Never volunteer any information, keep answer brief, be direct wait on the explanation until asked to discuss the question in detail. The deponent will often listen hard to the question and then pause. This allows their lawyer time to object to the question. Lawyers will often attempt to confuse you by wording a question differently. Beware of this trap, if you do not understand the question ask the lawyer to clarify it. If you are still having trouble, bring it to the attention of your lawyer.

It is very important to always be honest in a deposition. Do not add or remove any information for any reason, because it can be used against you later in court. Do not be afraid to say "I don't know". Do not be afraid to ask if you do not understand something, remember, it is acceptable to interrogate the interrogator.

### 1.7: Conclusion

The conclusion is extremely important because it is the last chance that the lawyer has to talk with the jury. Body language can be an extremely valuable tool for the concluding remarks. Words should be well thought out to match body language, creating a picture in the minds of the jurors. It is also very important for the lawyer to ensure that he uses his own style, and that his body language does not interfere with his remarks. When using basic principles, ensure that they are not out of context. The jury will remember what is said here most clearly when deliberating. At this point, the jury has heard the entire case and now is the time to list the major points one more time. Often, lawyers will put a new spin on a recognizable situation to get the jurors' attention; this is known as alienation.

Lawyers do not know anything about the background of the jurors, which makes it difficult to explain the pain, horror, and disfigurement that the plaintiff has sustained. The lawyer must be a good enough storyteller that he can lull the jury to sleep. At the end of his statement, he should fluff the ego of the jury a little by letting them know how important they are, and what a service they are doing for society.

### 1.8: Summation

The summation is the pivotal moment in a case. The summation is the closing of the conclusion. When you start to wrap things up, you can either make or break the case. The lawyer must not bore the jury. Do not introduce yourself when closing, as the jury already knows you, and you already know them. In closing many lawyers simply bring up the basic principle of product liability. The lawyers can use visual aides to compliment evidence, or even a podium to project an aura of power. Often podiums act as a barrier between the jury and the lawyer, and it is better to not use them.

The closing arguments allow the lawyer to state precise facts about figures of money and damages caused by the product. The lawyer should use this opportunity to guilt the jury into siding with him. Damages that would not normally be damages, such as doctors or dentists' bills should be brought up here. This will make you seem like a fair person.

The lawyers should also bring up sensitive topics. When explaining these topics to the jury the lawyer should have thought about what is going to be said and talked about. At the end of the statement the lawyer will be in an awkward situation and they must tell the jury the options before them to make right the wrongs the plaintiff has suffered. This is a very touchy spot, and must be handled with kid gloves. The verdict should be appealed to the jury, and they should be left feeling like they are very important, and their duty means very much.

**1.9: Classic Cover Up**

The 1964-1970 Ford Mustang, that has a major defect in its design that can cause serious injuries to whoever is in it. The problem with the Mustang is the design of the gas tank. It is a drop in gas tank, so the top of the tank is at the floor of the trunk. It was designed this way to save money. It is inexpensive to produce and install. The Mustang was originally marketed as an affordable sports car, so keeping the price down was extremely important.

When the Mustang was struck from behind, the gas tank would be crushed, and could spray gasoline into the passenger compartment through the back seat. If the gasoline ignited, a huge fire would be started inside the vehicle. Ford maintains the collisions were all at high speed, and therefore didn't cause any more deaths than in any other car, but studies have shown that burning deaths in Mustangs is nearly three times that of other cars built in the 60's.

One thing that must be understood is that when the Mustangs were built, Ford was not breaking any laws, because there were no laws in place governing safety in automobiles. The only thing that Ford could be criticized for is not doing what is morally right. Ford was sued over seventy times for the burning of the Mustang, and each time they settled out of court with little publicity. But, Ford still didn't change the design until 1971.

Lee Iococa, the president of Ford, helped design the Mustang. He was taped by secret recording devices saying, "Safety is ruining the automobile industry." These would leave one to believe that Ford did not care for safety, especially not when it was

not legally bound to it. It could be said that Ford tried to cover up the issue, especially when you look at the withholding of the crash test 301 video tape, in which the gas tank of a Mustang is shown rupturing and covering the back-seat passengers with gasoline.

Lee Iococa has also been quoted as saying, "If you want safety, buy a new car." No matter how true the statement, it is still a terrible thing to say. It shows that Ford didn't care what happened to its customers, and that they knew a problem existed. Ford should be held negligent for not changing its design.

## 2. : An Engineer in the Courtroom

### 2.1: Introduction

The idea of being called upon to testify in a courtroom can be a daunting one, especially if you are being sued due to injury or loss caused by one of your products. In a case like this an engineer may have to go into the courtroom and testify. It is important that he or she know what will be expected, and equally important, what they should expect in the courtroom.

When litigation comes down on a person, it may seem as if the court system is bullying the engineer for designing a good product. It may become discouraging to know that you try as hard as you can to provide a good product, and still it has failed. Why even try to design anything? It just may not seem worth it. These may be initial feelings of an engineer, and that is why engineers need to know how to deal with litigation. It may be as simple as going into the courtroom and explaining how your product works. You may not even have to appear in the courtroom. A simple meeting with an attorney often can clear up things by pointing out something that the plaintiff or the attorney overlooked.

While the court system in our country may not be perfect, it is there to serve us all the best it can. Sometime frivolous lawsuits are brought up, but the court has ways of dealing with that. So, while it may seem unfair at time remember that law has come a long way and is still improving.

The first need for a set of laws happened when man first realized he could not live in chaos. He realized that if he left his neighbor alone, his neighbor would probably leave him alone. Thus was developed, slowly over time, the idea that everyone should have the right to their own liberties as long as they are not infringing on another's liberties. However, along the way other legal ideas were tried and failed for one reason or another.

Hammarabi's code is one of the oldest. It said, "An eye for an eye, and a tooth for a tooth." . This did not work for two reasons: 1) It punished a misdeed with another misdeed, and 2) It did not do anything to prevent misdeeds.

Other early frameworks for law were the Ten Commandments of the Hebrew Testament of the Bible, and over time the Magna Carta came into existence. All of these legal ideas have shaped our modern society and the basis of our legal system today: the Constitution.

**2.2: The Nature of Accidents**

The term "accident" is a very difficult one to pin down because there are many individual interpretations of the term "accident," so to come up with a concrete definition is a difficult task. The author gives his best attempt at defining accident by giving two criteria that an accident must meet. The first is "an occurrence that is unexpected". This criterion alone is too broad of a definition for "accident" and must be narrowed down. The second criterion that the author uses to define an "accident" is "an occurrence that causes loss or injury, which can be expressed in some form of economic terms." These two conditions will be taken into account every time we look at an accident.

What kinds of occurrences fall into the category of accidents? The author conveniently breaks down accident into sub-categories. The first is collisions, or two bodies trying to occupy the same space. The most typical example of this would be the automobile accident, but many other accidents fall into the collision category. Some other accidents that fall into the collision category are vehicles hitting fixed objects, vehicles hitting a non-moving machine, airplane crashes, a vehicle hitting a person, a person running into a moving machine, and a person running into another person.

A second kind of accident is slip and fall accidents. These kinds of accidents can vary greatly from case to case and include, but are not limited to, tripping, scuffing, and physical malfunction of the person (a heart attack, for example). A special sub-case of physical malfunction is dizziness in which a person has complete or partial loss of balance and/or direction control. Other examples of slip and fall accidents include unexpected change in surface level, loss of step support, loss of balance and/or support of

the body, and fall from a ladder or step.

A third category of accidents is loss of control accidents. This category includes steering failure, brake failure, and all other failures of controls. Inadvertent motion is included in this category and described as "jumping into gear." If a vehicle is left in an apparent neutral position and then begins to move under its own power, it falls into this category. Inadvertent motion accidents do not, however, include a vehicle rolling downhill on a slope.

Being hit by a falling or rolling object falls into a fourth category. . A machine rolling down a slope and striking a person falls into this category..

Other categories of accidents are suffocation, which includes drowning, electrocution, poisoning, shock and vibration, entanglement, cuts and abrasions; fire, which includes chemical burns, explosions, radiation, and burns from contact with hot surfaces; and mechanical failure.

A further category is being struck by a projectile. This category includes firearms and other devices such as hunting bows. It also includes war, which is such a special case that it has its own rules, and injuries and damage due to war are included in a separate class. It is to be expected that people will get injured and killed in a war and therefore does not fit the laid forth definition of an accident.

Natural or Environmental Factors are a large category of accidents. Nature is so unpredictable and thus almost all damage caused by nature are considered accidents. This category includes injuries or death caused by heat, cold, animal attacks, wind, and lightning.

There is also a category for the intentional killing of another human being. It is called homicide. Special cases of homicide are suicide, the intentional taking of one's own life, and legal intervention, which is capital punishment.

Of course not all accidents can fit nicely into these categories, and as the world changes, we must also make new categories to fit in new kinds of accidents.

### 2.3: Why go to court?

Why do we go to court? The simplest response to this question is that society and the

people who make up society are not perfect. This imperfection leads to disagreements that need to be solved in a civilized way. Thus, we have created the need for an organized court of law.

These differences are not bad, however, for without them the world would be a terribly boring and unproductive place in which no progress would be made. Need is the mother of invention. However, with invention comes misuse. A knife can be used to cut food or to kill another human. A gun can protect you from a wild animal or take an innocent life. Almost anything can be used or misused with evil intentions and thus we have developed a code of laws to punish the wrongdoers and compensate the injured. Some simple complaints given as examples include: your cow is eating my grass, you stole apples from my apple tree, and your dog bit me. Now in each of the cases in which a human life was taken, who is at fault? Is it the person pulling the trigger or doing the stabbing? Is the product designed defectively or were the weapons were illegally obtained? Many explanations can be given, but ultimately it is up to the court of law to decide.

As a result of these complaints, over the years, a body of laws has been formed to regulate who is at fault and who should be compensated. These laws are extremely technical, but can be summarized as follows:

1. The product must meet the expectations of the buyer and the user.
2. The product must not be unreasonably dangerous.
3. The product must not be defective.
4. The product must warn of hidden or unexpected dangers.
5. The product must be manufactured according to specifications.
6. The product must not be misrepresented.
7. Proper instructions for safe use and operation must accompany the product.

Also, there are a series of conditions that apply to the user which include:

1. He must use the product according to instructions and warnings.
2. He must not misuse the product.
3. He must maintain, repair, and inspect the product according to the instructions.

Sometimes the person who is likely to be mostly at fault may be unable to pay for the complete amount of the damages, and a plaintiff may go after the individuals or

companies who are best able to pay for the damages.

### 2.4: Avoiding Litigation

There are six main ways to avoid litigation. They are avoiding the accident, protecting from the accident, make the accident safe, warning of the impending accident, warning of the possibility of the accident, and protecting the operator from the accident if it should happen.

If no accident occurs there can be no litigation. It is the engineer's responsibility to prevent the accident from happening. The design of the product should prevent against future accidents. Basically, with no accident there can be no litigation.

Next, we examine protecting against the accident. If the accident is bound to occur, some measure must be taken to prevent the accident. Locking mechanisms and shields can guard against many unwanted ill side effects from many dangerous products. However, beware of "ad absurdum", which is the addition of too many safety devices, which just complicates the design and outweighs the benefits.

Making the accident safe is another way of avoiding litigation. Examples of this include roll bars, safety belts, and air bags. For whatever reason, if the operator gets into trouble, these devices protect the operator from injury or death.

Aside from actually protecting from the accident, if the engineer warns of the dangerous situation, the user must exercise caution when using the product

### 2.5: The litigation Process

The steps of the litigation process are as follows. They are the claim, the response and defense, the discovery process, and finally, the trial.

The claim consists of the summons and the complaint. The plaintiff files a suit in which they feel some wrongdoing has been done against them. The court decides whether the case is legitimate, and then produces a summons, which notifies the offending party that they are being sued.

In the response the defendant either agrees to the claims or denies all or most of them.

In the first case, a settlement may be reached out of court. Otherwise, litigation moves forward.

The discovery process follows in which the plaintiff and the defendant build their respective cases for themselves. However, the discovery periods are very different for each side.

This is followed by interrogatories where each sides asks basic question about the case and answers are obtained. They are facts and cannot be disputed. They answer basic question, like what product is in question here, where did it happen, and when. Other parts of the discovery process are requests for production, requests for admissions, inspections, and depositions.

This is all followed by a trial. At trial a jury decides who is at fault, and awards damages to the suffering party. They may award compensatory and punitive damages to any amount they see fit, but the judge has final decision on the amount of the reward.

### 2.6: Engineers and Engineering Information

Engineers are used in product liability cases because they have knowledge in areas that the lawyer may not. They know why products were built the way they were, and also why some of the alternatives methods for building this product were passed over.

Engineers are also important because they are able to interpret design plans and blueprints very rapidly. This is important because it can be shown exactly how the product was supposed to be built and if there is a defect in the design of the product. If the plans are good, then the defect was added during manufacturing. This is an important piece of the product liability puzzle.

Engineers are needed for the plaintiff to testify that the product was defective either in the design process or the manufacturing. Defendants need engineers to testify the exact opposite: they need engineers to tell juries how the plans were sound and good, and how user error contributed to the accident.

The lawyer will often try to find the specific engineer who was in charge of the design for that specific product. This may be one specific person or a group of

individuals who worked as a team. Either way, it is always better to get the engineers who were actually involved in the design rather than engineers, who may be just as intelligent, and were not involved in the development.

Plaintiffs in most cases will try to show that part of the design was defective. They will often offer an alternative to the current design of the product, which they believe would have prevented the accident. The defense team will try to show how the current design is the best possible design and is better than the alternative offered by the plaintiffs.

Sometimes there is no information. It is not usually the case that someone has intentionally destroyed the information, but over the course of normal day-to-day activities, information may be lost. In this case it is better not to guess or think you remember something. If you are going to testify something it is always better to know for sure or tell people that you are not sure. Don't make statements appear as fact when you yourself are unsure if they are, in fact, 100% true.

Finally, it is important to note that engineers may testify as either a fact witness or an expert witness in a trial. If he or she testifies as a fact witness, the engineer is allowed to only comment on facts. If, however, the engineer is testifying as an expert witness, he or she may also give opinions on any questions asked of them.

### 2.7: How the Engineer can help the attorney

It is clearly evident that engineers and attorneys think in different ways. Engineers deal with numbers and physical things with some degree of repetition. Attorneys, on the other hand, deal with less of the physical and more with ideas and concepts. When these two parties work together they must be patient with one another. A good engineer may not understand the intricacies of the law in the same way a lawyer may have no idea about stress analysis.

Attorneys need experts in different fields because the attorney must concentrate fully on the law. If he were to immerse himself to become an expert on all of the fields he needed to use he would not be doing his job and would be ignoring the law aspect. Thus lawyers hire experts who know everything about a particular subject. They work hand in

hand to reach justice.

In the case of an engineer in the courtroom, he must still realize that it is essentially a legal matter. He needs to take the role of helper and not leader. The attorney is in charge, but needs the aid of the expert. At all times when the engineer is helping the attorney he needs to tell the attorney his honest, truthful opinion. If he knows for a fact it is true, that must also be known so the attorney can do the best job for his client.

There are many specific ways in which the engineer can help the attorney. These include an active understanding of the design and development process, an explanation of the products, systems, parts, and operation of the machine, how the product was developed, evaluated, and tested, and telling the attorney about why a product is successful. Other areas the engineer helps the attorney are testing and analyzing a product, explaining the uses and applications of a product, telling about the relationship between the operator and the machine, and conducting accident reconstructions. Furthermore, the engineer can secondarily aid the lawyer by discussing the top of the line products in a certain field, understand complex engineering literature, aid in taking depositions, constructing possibilities of the accident, translating technical information, evaluating probabilities, and explaining complex technical processes. Without an expert engineer, many lawyers would be lost in a haze of numbers and scientific concepts. In order to be the best in the courtroom, lawyers use engineers.

### 2.8: The Discovery Process

The discovery process is the time after charges have been pressed but before the trial when both parties search for information that will help their argument. This process often involves inspecting the grounds where an incident took place, inspecting equipment or machinery in the case, and questionings of witnesses and experts during "Interrogatories." Some questions that may be asked during an interrogatory are 'when was the machine designed', 'how many of them were made', 'during what production period were they made',' what is the history of the accidents in this model', and 'what is the history of similar models'. Other questions that may be asked are alternate designs chosen for this product, the testing done on this model, whether testing is done on every

machine made, and what testing was done on the subject machine. Many of the answers may be complicated technical language that the engineer, who is aiding the attorney, can evaluate and interpret into layman's terms. This may seem like a lot of information. One may ask why the plaintiff needs so much information. Well, this is because if the lawyer wants to get the injured party a recovery, he must show the plaintiff incurred injuries and economic losses as a result of a feature of the machine, the feature of the machine was the proximate cause of the loss, the feature was a defect in design or manufacturing of the machine, the "defect" was in the product at the time it left the manufacturer, alternate designs would not have hurt the operator, the alternate design would not be of prohibitive cost, and the alternate design would make a significant improvement in the safety of the machine.

Now one can see that with the burden to prove all of these areas, the lawyer for the plaintiff must get as much information as possible in the discovery process. At the same time the defense team is working hard to protect the defendant from being sued. The defending lawyer must show that the plaintiff's claims are not valid, the injury or loss did not happen, the fault of the accident was not as the plaintiff claimed, the fault lies elsewhere, or no defect existed on the machine.

When answering questions in the discovery process there are three cautions the narrator finds noteworthy. First, in order to answer as truthfully as possible, avoid inflexible and infinite words such as always, never, all, none, impossible, absolute, and certainly. Second, don't be misled by from the real and base issues of the matter, and finally, watch out for careless use of generic, vernacular, or idiomatic terms.

### 2.9: The deposition

Depositions are mainly part of the discovery process, but during the trial they have many other purposes. Depositions are used to ask witnesses of accidents about there side of the story. They may hold pertinent information that could bring out the truth in the case. However, they are not the only thing a trial rest on.

In general there are six rules for depositions. First, listen to the question. There may be tricky wording, or the lawyer is trying to get at something specific. If you do not

understand the question, say so. Then, have the questioned repeated. Secondly, pause before you answer the question. The author gives three reasons for this pause and it is not as intuitive as one would think. First, you should make sure you give the proper answer, which seems obvious, but may be forgotten when under the gun. Second, which is not as obvious as the first, if your attorney has an objection to the question, he or she will need time to object to the question. Your pause allows the attorney this time. Finally, another reason, which may not be immediately thought up, is that you want to feel you are controlling the pace of the depositions. Take your time and don't be hurried by the lawyer into making a mistake.

The third rule is answer only the question asked of you. If the attorney asks "Can you tell me what time it is right now?" The correct answer is "yes" or "no", not 2:10 for example. Also, if the attorney asks if you have an opinion on the specific case, the correct answer is again "yes" or "no." If the attorney wants your opinion he will ask "What is your opinion on this case?"

A fourth rule to depositions is to answers truthfully and completely to the best of your ability. It may be tempting to skew the truth to aid your party, either plaintiff or defendant, but this is a very bad idea. These answers do not look good to a judge and look especially bad to a jury. A fifth rule is don't volunteer. This means that you should only speak when spoken to. Do not add extra information at the end of your statement it could get your client into more trouble without you knowing it. Finally, don't argue or advocate. Arguing is for the attorneys to do. Your job is simply to answer questions within your knowledge. If you believe a statement has been made that is technically incorrect and is in your area of expertise, speak up, but don't argue too much because that fails to make your point very well.

The reasons for depositions are for the purpose of discovery, to establish facts, to determine the opinions of the expert witnesses, to seek information and bases to impeach the witness, if such an opportunity exists, to pin down testimony so it may not be changed during the trial, to preserve testimony for the trial, and finally, the attorney may use the deposition to gain knowledge of the plans or strategy of his or her opponent.

In review, during a deposition, always be truthful, follow the guidance of the attorney, take your time, don't volunteer, if you don't know the answer, say so, and you are an

expert on a technical subject that the lawyer needs; in effect you are important to the deposition.

## 2.10: The Trial

When the two parties involved in a dispute fail to reach an agreement on their own, they take their claims to court. They present their arguments and findings to a judge and a jury, who render a decision, which the parties must agree too. However, through the appeals process this can become a lengthy and expensive ordeal.

The trail cannot take place without the pre-trial activities taking place such as the interrogatories and the depositions. After all of this has taken place the plaintiff and the defendant is ready to convince the court that there side is the correct side. How do they go about this? They follow the trial process.

Prior to any lawyer saying anything to a jury, the jury must first be picked. The jury usually consists of six to twelve people who are chosen through a process of elimination to try to get an unbiased and balanced jury.

Upon the completion of the choosing the jury, opening statements can begin. The purpose of the opening statement is for each side to tell the judge and the jury exactly what they hope to show throughout the course of the trial. The plaintiff's attorney usually gets to present his statement first which is then followed by the defendant's lawyer's opening statement.

In the plaintiff's opening statement, the lawyer will tell why the loss was not the plaintiff's fault, and if there was and injury, why that was caused by the defendant. The defendant on the other hand tries to lay the groundwork for why the plaintiff's design was lacking and as a result caused an economic or physical loss to the individual.

Following the opening statements the plaintiff presents his case. The plaintiff tries to present a story of the accident as the plaintiff sees it, medical proof of the costs and the suffering involved in the injury, other proofs of the losses involved, lay witness testimony verifying the story or scenario of the accident, and expert witness testimony as to the claimed cause of the accident. Other pieces of evidence the plaintiff might present

include, expert witness testimony as to the defect of dangerous condition that caused the accident, testimony as to what features or design conditions would have prevented the accident, and testimony as to the cost of the accident to the plaintiff, including medical costs, lost wages, lost earning ability, and any other element of damages allowed in the particular jurisdiction. Finally, the plaintiff's lawyer ties all the evidence into a package that suggests the defense is responsible for the accident and therefore is liable for the costs of injury and damage. When the lawyer is done, he rests his case and says to the jury, "This is the case for my plaintiff-client."

Following the plaintiff's case is, conveniently, the defenses case. Here the defense tries to dissuade the jury from believing the plaintiff's testimony. The defense does this by presenting testimony about the machines and its background, testimony about the manufacturer and his activities in the matter of safety, testimony of witnesses to the incident that do not agree with the scenario of the plaintiff and his witnesses, and expert testimony showing why the machine was safe and not defective. The defense further presents testimony disputing any or all claims of the medical claims, testimony disputing the economic claims, and any other testimony or evidence, which refutes claims made by the opposition. Following all of this the defense rests its case, and final arguments can begin.

Before final arguments the judge will tell the jury that they have now heard all the evidence in the trial. Now each attorney will have a chance to summarize the evidence as it applies to the matter in this court.

At the conclusion of the final arguments the judge instructs the jury that they now have to make a decision about who is at fault. The jury's job is to make decision in an unbiased way about the facts of the case. (The judge makes unbiased decisions about matters of law.) The jury elects a foreman and they go about deciding who is at fault, what percentage they were at fault, and any other question that must be answered to fill out the verdict sheet.

### 2.11: Questions

This chapter discusses the various situations in which questions are asked, the various

types of questions, the various people who ask questions, the questions they ask, and the way questioners ask questions.

First off, when are questions asked? There are several different situations in which questions are asked. A few of them are simple inquiries, legal inquiries, and litigation matters. A simple inquiry is asking you if you know anything about a particular subject or the like. A legal inquiry is asking for your opinion in a legal expert sense. Finally, there are litigation matters, which can pop up at any time, and you should consult the legal expert when answering these, since you are an expert in engineering.

Now we ask, what types of questions can be asked? They can be generally grouped into specific or general, open or closed, leading or non-leading, formal or casual, polite or serious, rhetorical or interrogating, simple or complex, and, probing and outlining. An example of a general question is "How is the weather?" where a specific question is "Is it raining outside right now?" Closed questions require a yes or no answer where open question allows you to speak more freely. Leading questions are directing you in a certain direction. An example of this is "Didn't you run the red light?", while in contrast a non-leading question would be "Will you describe the path of the vehicle in the accident?"

The difference between formal and casual is basically whether it is on or off the record. If there is going to be a transcript of what you are saying it becomes formal questioning, otherwise, it is informal. A simple versus complex question depends on how many parts of the question there are to answer. Lawyers will often ask complex questions to get the testifying party to say what they want. Next, probing and outlining questions may be asked. Probing questions are asked to get information that the lawyer does not know about out of a testifier. Outlining questions are used to show the court the result of the probing questions once the information has come out.

Now not just words are needed to understand the true accounts of what a testifier is saying, but emphasis is very important also. The book mentions the sentence "My uncle was a dairy farmer in Southern Michigan." Simply stated, you are declaring that you are related to a Southern Michigan dairy farmer. However, by changing emphasis you change the meaning of the sentence. "My uncle was a dairy farmer", with emphasis on the underlined word is implying that you may have thought some other member of my

family was a dairy farmer, but in fact my uncle was the dairy farmer. On the other hand, simply by changing emphasis to "My uncle was a dairy farmer" you have completely changed the notion of this statement. You are emphasizing the fact that your uncle is no longer a dairy farmer but was at one time.

### 2.12: Accident Reconstruction

Why reconstruct accidents? Well, reconstructions often settle disputes which are a matter of opinion until a reconstruction occurs. There may be many parameters that were not considered in the cause of an accident that can only be seen by accident reconstruction. A good engineer can take all of the physical evidence, and turn it into an extremely accurate reconstruction of the accident. They look at skid marks, damage to machinery, distances rolled and moved, and other physical evidence. With all of this they can absolutely rule out many things that happened, while making very probable guesses as to what actually happened.

Ideally all of the evidence, testimony, and personal recollections fit together to form one clear reconstruction. However, most of the time things aren't ideal. There may be conflicts of testimony, with one witness saying this happened, and the next witness directly contradicting the next. It is not usually the witnesses' fault when they make contradictions. They may not be experts, simply not paying attention when the accident occurred, or it was simply so long ago the event has faded from their memory.

To perform a reconstruction the expert must recreate the accident as it happened. However, as discussed above this is often difficult. After the first layout, the book lists several things that will appear:

> Some of the information will contradict other information. Some witnesses may not agree. Physical evidence may not agree with the witness testimony, and so on.
>
> Some evidence and information will be in poor definition. That is, some of the information may be general (fast, large, heavy, etc.) when more accurate information is needed

(55 miles per hour, a trailer 22 feet long, 3200 pounds, etc.)

Some needed or desired evidence may be missing altogether. Marks may have been erased. Data may not have been taken. The evidence may have been misplaced, etc. Worst of all, some witnesses may be deceased or otherwise unable to respond to questions.

Some of the information may not seem correct on the surface. For example, a witness may testify that he saw a fire, but no other information suggesting a fire exists. Or another witness may say she heard a scream from an area where no other people were found or believed to have been. Maybe marks on the scene of the accident seem to denote action that is impossible or that seems not to have anything to do with the incident under investigation.

Some of the testimony may change as it is being assembled. This does not suggest faking data or fraud, although it is possible. Yet, as witnesses consider what they saw and experienced, they tend to form their impressions into logical segments of incidents. Sometimes they change their stories into what they feel "must be a more accurate story."

Some of the evidence and information doesn't seem to fit into any logical format, at least in what we suspect or begin to see as the scenario. (Note here that a good reconstructionist will delay any early or tentative thoughts on the matter until all the information is in and all of the analyses are completed.)

Sometimes the information has no outward or apparent problems, but someone still "smells a rat." The unproved gut feel of the witness or even the reconstructionist may be significant. (In truth, such "smelling of a rat" is usually an incomplete piece of logic, perhaps subconscious, that is a partial or incomplete signal that something is not right.)

Next there are six guidelines for a good accident reconstruction. The accident must be square with the laws of physics. If the accident could not have physically happened in the way a witness is describing then it must be reviewed as false. Secondly, the reconstruction scenario should have good agreement with the mass of the information and evidence available.

Also the reconstruction should be explainable to lay people-jurors for instance. What

good is a reconstruction if you can't explain it to lawyers and a juror to prove your case? Reconstructions should also be free of bias. A good engineer works with numbers and facts and not for or against someone. Finally, accident reconstructions are a matter of litigation and can be disputed by the opposing party. It is the engineer's job to provide the reconstruction to the best of his knowledge in a truthful, unbiased, and easy to understand method.

### 2.13: Definitions and Techniques Employed by Attorneys

There are many terms that are commonplace to the courtroom, but may seem alien to an engineer who has entered the court of law for the first time. The engineer will need to have a basic understanding of some of the more common definitions used solely in the courtroom.

An adverse witness is a witness testifying by the opposing attorney, but not by the attorney he is assisting, or for whom he is consulting. Answer is a term that is interchangeable with response. Arbitration/Mediation is when the courts are so swamped with work that a mediator or an arbitrator settles the case. These are usually done in smaller valued cases.

You will often hear the term bar used in the courtroom. There are three main usages of the word bar as it refers to the court. First, it is used to denote anywhere where legal activity is taking place. Examples of its usage are "the question at bar" or the prisoner before the bar." Second, bar refers to a group of attorney's in a certain geographic location. Lastly, to bar, used as a verb mean to prevent or keep out.

The bench is referring to the location of the judge in the courtroom. Best evidence has to do with the acceptability and admissibility of the evidence. A breach is a failure to perform or a break in the chain of legal action.

Burden of proof is a reference to the responsibility of the opposing party to pin the wrong doing on to the defendant. They are in essence burdened with the job of proving that is was their fault. To charge a jury is to instruct them in legal matters, usually done by the judge. However, it can also be used interchangeably with the term accusation.

Civil Law is the part of the law that deals with relationships between people. A crime

can often be tried in criminal court and then differently in civil court. A complaint is the formal name for the list of claims against the defendant.

Due Process refers to the steps in the legal process. If you are charged with something, you have the right to a trial and an attorney. Duty, as used outside of the courtroom is what you are supposed to do. Duty goes hand in hand with responsibility. You often here duty used in the context of "jury duty."

Evidence is information that is used to prove or disprove matters of disputed fact. It can come in many forms, such as documents, pictures, testimony of a witness, accident reconstructions, and model.

An expert witness is a witness who testifies for a specific side in a dispute in an area in which they have expertise. They are used to help a jury understand the technical aspects of the matter at hand.

Forensic is a term which generally mean "belonging to the law." You often hear the term forensic science used, which quite literally means "science belonging to the law." Forensic science is science used to present evidence in a case to settle matters of disputed evidence.

Hearsay is a term often stated as the Hearsay Rule. This term generally deal with the admissibility or inadmissibility of testimony from a witness. A witness may be lying or have irrelevant testimony which could sway the jury. The judge, if he decides it is hearsay, will instruct the jury to disregard certain testimony.

Hidden defects are defects that are hidden from view or not easily detectable even by reasonable and common inspection of a product or component. Under the law of strict liability, even undetectable defects are still the fault of the manufacturer, even if it was unreasonable for them to detect the defect.

### 2.14: War Stories

War stories are a little bit like fish stories. While they are all based in truth they tend to get distorted over time. However, unlike fish stories, war stories can be told to be humorous, to make someone look bad, or to educate other attorney's. The stories in this chapter are meant to educate the engineer for his future appearances in the courtroom.

The author tells of a seventeen-hour deposition because of a scheduling mistake. The

lawyer has changed his future requirements for the maximum length of time he will be deposed which is all with-in his rights.

Then he tells of a deposition at the airport gate. This decision was reached because both of the attorney's were traveling large distance to get to the place where there were to depose the witness. In essence the deposition took place at an airport.

Often times expert witnesses cannot prove how exactly something happened but they can definitely prove how something did not happen. They apply mathematics, physics, and general engineering principles to an accident to determine if things could have happened the way in which they are stated. They cannot, however, often make statements to how exactly something happened.

The author tells of a story about a judge who calls the expert witness to the bench after the questioning is over. The attorney's seem worried and watch closely to what is going on. The judge asks the man if he knew a certain individual whom he graduated with at the same school and the witness answered yes. It turns out that the judge's wife was related to the man he was asking about and the judge just wanted to be nice. He then told the witness to not tell the lawyers what they had talked about for a while to keep them in suspense. One lawyer finally asked and, after a slight delay, the witness told him.

No one wants to be surprised during a trial. The pre-trial process aims at preventing surprises from happening. Neither the judge nor the lawyers wants to be surprised during the trial. In this war story the author tells of a plaintiff offering the defendant a settlement before the jury came back with a verdict and the defense turned it down. Then later in the trial they offered a spread settlement. If the jury came back and awarded less than $300,000 the defendant would still pay a minimum of $300,000. However, on the other hand he could not pay more than $900,000. If the jury returned with a figure between these amounts, the defendant would pay the exact amount. The defense turned down this settlement and let the case go to the jury. However, right before the jury returned its verdict, the defendant decided to accept the deal and pay $300,000. It was only after the deal had been made that the defense found out the jury was going to award nothing to the plaintiff and had found the defense not at fault.

The author goes on to tell many other war stories which all have their own merit in certain situations, and a valuable lesson can be learned from each of them.

# 3. : Products Liability in a nutshell

### 3.1: Definition and Scope

A product in most cases is thought of as personal property or "chattel." The law of products liability began in the sales article of the Uniform Sales Act which is now known as the Uniform Commercial Code, as well as in the common law of torts. Products Liability has extended beyond tangible goods to include such intangibles as electricity. In deciding whether the law of products liability should apply to something, the issue should not be restricted to the inquiry of whether a product is involved. Rather, it should be directed to whether or not the defendant is in the best position to spread the loss and prevent injuries, and to other policy concerns.

In general, the reason for imposing liability against a product supplier for injuries resulting from a product is because the product was supplied in a defective condition. There have been cases in the past where there was nothing wrong with the product, but the law of product liabilities was still enforced. The problem with determining defectiveness is one of great difficulty, because it calls into question the overlapping views people have of physical and conceptual defectiveness.

The three types of product defects are: 1.) manufacturing or production flaws, 2.) design defects, and 3.) defective warnings or instructions. In addition to these some may add a fourth category, 4.) misrepresentation. One of the most important things to do in the case of defects is to be able to distinguish between production and design defects. Misrepresentation is not clearly distinguishable from other types of product defects either: the product may carry express representation, visibly imply safety, and the defects of inadequate warning and of misrepresentation are often closely intertwined because of countervailing statements that go along with a warning.

The term "defect" is used to generally describe the kinds and definitions of things that courts find to be actionably wrong with a product after it leaves the seller's hands. In order to be considered a defect the product has to live up to the prevailing definition of

"unreasonable danger." However, the implied ordinary consumer expectations are not necessary in the case of misrepresentation. Another test of defectiveness sometimes used in that of presumed seller knowledge is, would the seller be negligent in placing a product on the market if he had knowledge of its harmful or dangerous condition? There are some products however, where in the present state of human knowledge are incapable of being made safe for their intended use, most especially common in the field of drugs. It seems safe to conclude that with the two types of approaches that are used in the case of product defects, the risk-benefit approach looks more towards fault, while the consumer expectation test looks only toward strict liability.

It is stated that the law of product liability applies to the sale of defective products. A "sale" is defined in the Unif Comm. Code as, "the passing of title from the seller to the buyer for a price." In any other case therefore, the law of products liability is not effective.

### 3.2: The Causes of Actions and Damages

Negligence of a product can arise in many ways, commonly through inadequate inspection, processing, packaging, warning, design, and marketing or in any way in which a defendant does not meet the standard of care of a reasonable person in dealing with a product, thereby causing injury in the plaintiff. A person can be found guilty of negligence whether or not he or she is in the business of selling such a product. Legal violations can give rise to negligence say, if the plaintiff is within the class of persons protected by the statute and the risk involved within the statute's coverage.

Strict liability for violation of warranty is something that dates back to the Middle Ages, but the complete development of strict products liability awaited the elimination of the privacy requirement in the 20th century.

The indirect warranty of merchantability implies only when the seller is a merchant, defined as "a person who deals in goods of the kind" or otherwise by his occupation or by the employment of an agent or broker or other intermediary "hold himself out as having knowledge or skill peculiar to the practices or goods involved." UCC & 2-315 provides: Where the seller at the time of contracting has reason to know

any particular purpose for which the goods are required and that the buyer is relying on the seller's skill or judgment to select or furnish suitable goods, there is unless excluded or modified under the next section an implied warranty that the goods shall be fit for such purpose. This warranty is often treated interchangeably with the implied warranty of merchantability, but the two are not the same.

Some factors, which are considered to be abnormally dangerous, are: 1.) the existence of a high degree of risk, 2.) the likelihood that the harm will be great, 3.) the inability to eliminate the risk by the exercise of reasonable care, 4.) the extent to which the activity is not a matter of common usage, 5.) the inappropriateness of the activity to the place where it is carried on, and 6.) the extent to which its value to the community is outweighed by its dangerous attributes.

As a general proposition a plaintiff is given the opportunity to plead and prove as many counts or causes of action as she wishes and is not required to elect or select the theories on which she will proceed. It has been found however that due to the many theories on which one can proceed, one or more of the theories will overlap at which time the plaintiff's theories are restricted in this regard.

A plaintiff is usually entitled to recover all foreseeable damages in a products liability suit based on tort. Whether in tort or warranty at all time the damages must be foreseeable. There is a division of authority as to whether recovery for emotional distress alone is acceptable without the accompanying of a physical injury. No subject in tort law has caused more controversy than the recoverability of disciplinary damages in tort, including products liability. Evidence shows that only a small fraction of cases result in punitive damages, and many of these are business torts rather than personal injury cases. Another area in which efforts have been made to modify the common law by statute is with regard to joint-liability-whereas one tortfeasor is held liable for all damages suffered by a claimant, even though other tortfeasors may have contributed to the injury.

### 3.3: The Parties

This chapter examines the parties involved in a case, and how the interact. Parties can be plaintiffs, manufacturers, middlemen/retailers or used products salespersons.

Plaintiffs can sure any products defendant on any available theory to recover for

personal injuries. The plaintiff does not need to have purchased the product or used it, they could be a simple bystander. The effect of opening up products liability for personal injuries to include all foreseeable plaintiffs has had a profound impact on products liability law.

Manufacturers can be sued on any of the theories previously cited. Final assemblers as well as manufacturers of individual component parts can be sued for defective parts. It must be shown that a component part was dangerous when it left the manufacturers hands, or that the specifications make it dangerous when incorporated into the final product.

A manufacturer can be held liable for the downstream miss-assembly of a product by a dealer even if the unassembled product was not defective when it left the manufacturer.

The various theories of recovery, including strict liability, apply to all sellers in the chain of distribution, although it may prove to be difficult against a non-manufacturing seller. This is because the majority view of such sellers is that they are merely conduits with no responsibility to inspect for latent defects. If they do inspect however, they may be found liable for doing so with reasonable care.

An issue can arise when company A buys out company B, which produced a defective product. There is some argument as to whether company A is liable for the actions of company B. It is generally assumed that the responsibilities and obligations of company B are transferred with the sale.

There is no reason that warranties should be restricted to sales. The rental or lease of a vehicle or other product implies that the product is fit for operation. The lesser of a product may be held strictly liable for defects, which arise during the course of the lease.

Employers can be held liable for some injuries that occur at the workplace. In cases where an employer fails to warn employees of a known danger, then claiming damages outside the provisions of workers compensation is sometimes allowed.

In some cases it is not clear whether a transaction involved is predominantly one of sale of goods, or one of service. Many defective products are that way because of a service, or lack thereof, performed by the manufacturer. Services can be performed with or without care although products can be defective even though all due care has been

exercised. Professional services can be categorized differently than ordinary services.

Licensors and testers of other companies' products may be liable for certifying a defective product as satisfactory. Advertisers may be held liable in strict liability or negligence for misrepresenting the products of another company.

Professional Services

Suppliers of professional services, such as doctors, cannot be held liable for injuries, whereas suppliers of ordinary services can.

Pure Service Transactions

When a defendant provides a pure service the doctrine of strict products liability is not applicable. A repairer has no duty to care or warn of or correct dangers outside of the scope of work contracted for.

The courts are divided on the issue of applying strict liability to the builder-vendor of new homes. Some courts see "no reason for differentiating mass sales of homes…from mass sales of automobiles…". Other courts refuse to impose an implied warranty of habitability on something so complex. Such courts would most likely impose a negligence standard however.

In most states a landlord is expected to keep his premises is in their beginning condition. Since the lessees continue to pay the same rent, they can expect their rental units to be in the same condition. A premises occupier who engages in an abnormally dangerous activity, which injures others, may be held strictly liable.

When more than one party is held liable for their contributions to an act, there are two ways of dividing the responsibility: Liability by degree of fault, and liability divided equally according to the number of defendants involved.

When two parties are liable in the same act, but one is held strictly liable and the other is held liable in negligence, the courts are undecided as to whether contribution between the two is available. There are several different positions on the case where one of the parties is the victims' employer. Each position holds the employer liable only if he is at fault.

A settlement made in a case does not release others involved from liability unless the agreement expressly says so. Usually the non-settling party receives a credit on his liability to the victim for the settlement made by a co-tortfeasor.

### 3.4: Factors Affecting Choice of Remedies, Jurisdiction, and Procedure

Disclaimers, limitations of remedies and notices of breach are often associated with warranty litigation. It is stated and probably best said by the first line of the section on reliance that "Proof of reliance is expressly required as a condition to recovery for conscious misrepresentation, negligent misrepresentation, and innocent tortious misrepresentation, resulting in personal injury."

A question arises as to the primary reasons for the development of a doctrine of strict tort products liability. It was developed to avoid contractual restrictions on liability in warranty law. The be even more clear Products Liability in a Nutshell goes on to make it explicitly clear by stating, "The consumer's cause of action does not depend upon the validity of his contract with the person from whom he acquires the product, and it is not affected by any disclaimer or other agreement, whether it be between the seller and his immediate buyer, or attached to and accompanying the product into the consumer's hands."

As for disclaimers they must be placed in clear view where the average user of the product easily sees them. If the disclaimer is deemed inconspicuous or unclear it will be invalidated. Often times a disclaimer hidden in fine print or on the back of a purchase form will be invalidated for lack of conspicuousness and clarity.

Furthermore, a disclaimer must be delivered in a timely fashion or it will be invalidated. If the disclaimer is delivered too late it is considered unusable and therefore must be thrown out. In this same, way it cannot be used as a defense should the publisher of the disclaimer be sued in court.

Disclaimers of fraud or deceit are unenforceable. Furthermore, a number of courts hold that a disclaimer or liability for negligence is invalid as against public policy. This means that the disclaimer cannot be used in a court of law under most circumstances. It can, however, be used to defend in certain unorthodox cases of liability.

### 3.5: Production and Design Defects

A product is considered to be flawed if it does not conform to the specifications, which were provided by the manufacturer. With this in mind, we see the need for a theory of liability. There are many standards, but the mostly widely used and accepted standard is a form of risk-utility analysis. However, Manufacturers are allowed to set their own standards of defects. One manufacturer may find a twenty percent failure rate to be acceptable, while the manufacturer of another product may find that no less than a five percent failure rate is acceptable. If the products fall within these specifications then there is no defective product and thus no liability to pin on the manufacturer.

There is another concept called random defectiveness, which is illustrated nicely in the book by telling a story about a decomposed mouse found in a bottle of "Squirt" which was bottled by the Coca-Cola Company. This is clearly an outlier of a case as this may be less than a hundredth of a percent. With a percentage this low it is clear that it is not a manufacturing defect. A defect in a vehicle, for instance, is much more likely to be the result of a manufacturing defect than a decomposed mouse in a bottle of "Squirt."

Then the book begins to talk about the obviousness of danger. If a product is so obviously dangerous, it may be hard to prove in a court of law that the product is defective. For instance, a chainsaw is an inherently dangerous product. If someone cuts off and arm or a leg with this product, it is very difficult to prove defectiveness. In fact, it might only prove that the chainsaw works exactly as planned. Clearly, this would be operator error.

Finally, the chapter deals with a topic called crashworthiness. This is the ability of a product to lessen the injury or damage that will happen given that an accident has already happened. For example, if a car crashed, the frame, airbags, and seatbelts all make it a crashworthy vehicle. Also, there are issues with the fuel tank in some cars. How thick are the walls and how easily will the tank explode? The easier it is for the tank to explode, the less crashworthy it is, and the easier it is to prove defectiveness in a court of law.

### 3.6: Inadequate Warnings and Instructions, and Misrepresentations

There is a distinction that must be brought up immediately in any discussion on

this subject. That distinction is the one between instructions and warnings. An instruction is something that is given and meant to be used as the best or most efficient way to use a product. A warning, in contrast, is meant to ensure safe usage of a given product. Poor instructions rarely are cause for a lawsuit, while a poor warning can be the downfall of a company.

Warnings need to not just be adequate or sufficient; they must be perfect and cover all aspects of danger. When writing a warning it is not good to say, "Someone else will do it," or, "Hey, It will get done." Writing warnings may be the single most important way of avoiding litigation in the event your product causes an accident. If the warning on your product only covers half of the dangers, then you are liable for the other half. A great many lawsuits could be avoided each year by better warning labels on products.

Furthermore, it is the manufacturer's responsibility and the consumer's right to know of changes to the warnings. If the manufacturer discovers a warning after the sale has been made, they must make a reasonable attempt to warn the consumer of these so called post-sale warnings. The manufacturer does this through recalls of the product or through voluntary repairs.

# 4. : Kahn V. Makita

## 4.1 Background

The Magic Brush Painting Company, owned by Ron Weiser, was hired to paint the exterior of Stephen and Betty Kahn's home, the exterior of which was constructed of wooden clapboard. It is common practice to remove the old paint from the clapboard before laying down a fresh coat. The paint is removed by sand blasting techniques or by heating the paint with heat guns and then removing it using a scraper. This particular contractor was using the heat and scrape technique at the request of the Kahn's. While the painters were heating and stripping the paint a fire broke out. The fire was noticed by one of the workers and the fire department was eventually called. The fire caused damages to the Kahn's home, and they are seeking retribution from Makita for those damages.

## 4.2 General Accident Description.

The fire occurred on August 5, 1997 around 1 PM. The heat guns had been in use on a façade for nearly four hours. The façade was in front of a blocked crawl space, and it is believed that there existed a hornet's nest in this crawl space, which ignited after repeated passes of the heat guns.

There was a charged garden hose on site in the event of fire, which the workers used in a first attempt to extinguish the fire. Having failed to extinguish the fire, they then tried to contact Ron Weiser, the owner of Magic Brush, on his cellular telephone. The workers were unable to contact their boss and finally went in to the house to use a landline to call 911.

According to the fire department reports there were three different heat guns on site. A Black & Decker heat gun was found on the opposite side of the house from the fire, while the two Makita heat guns were found hanging from the ladder. The ladder leaned up against the house where the fire is believed to have started.

According to the witnesses assembled on that day, the Black & Decker heat gun was not responsible for the fire, so it will be disregarded. The Makita guns were both

model HG110 with a temperature range of 250 degrees Fahrenheit to 1,100 degrees Fahrenheit. They were being used to soften the paint on the exterior of the house so that it could be scraped off more easily. They are believed to have caused the fire.

### 4.3 Investigation and Analysis

We conducted several tests with the Makita HG1100, as well as analyzed the evidence provided. It was our goal to determine if the heat gun in question was defective.

We tested the heat gun against two different substances, an old wooden shingle and all-natural toilet paper. We chose these materials because we feel that they closely reflect the wooden clapboard and hornets nest present in this case.

We used a simple methodology when conducting our tests. We held the heat gun two to three inches away from the material for ten seconds. The heat gun had two controls, one for airflow and one for heat. Both controls were set on their highest setting. We took pictures at intervals where the material exhibited a noticeable change and recorded the time. The results are below.

Figure 4.1 - Toilet Paper test.

The paper at 0 seconds 2 seconds 6 seconds 8 seconds

Figure 4.2 - Shingle test

0 seconds 2 seconds 10 seconds

In the first series of photographs, the toilet paper flames up after 8 seconds of direct heat

from the gun. The wooden shingle turns black, and after ten seconds very small red-hot coals begin to appear.

These results lead us to several conclusions. First, we believe that the Makita model HG1100 is capable generating enough heat to ignite a hornet's nest. Second, the gun is capable of heating wood to a temperature that will cause small sparks to be created. The sparks are only created when the gun is in place for an extended period of time however. The manual specifically says to not do this.

The Makita HG1100 heat gun was UL 499 approved on March 26, 1997 while the standard was in its 12th edition of publication. There were more editions revised shortly after the incident, however, none of the changes were mentioned in this case. This standard outlines the safety of electric heating appliances as specified by underwriter's laboratories. In order for Makita to be UL approved, their product must comply with all regulations listed under this document. The specification includes electrical requirements, as well as many safety requirements the end user must follow.

For this electric heating appliance to meet the UL 499 standard, it must go through a rigorous series of tests. These tests measure the appliance from a variety of viewpoints, each section stressing a different, but crucial aspect of a safe appliance. The first set of tests deal with the construction of the appliance itself. It examines the materials used to build the product, and the fitness of those materials for the intended application. The appliances must undergo stress tests throughout the various stages of construction. The performance section "shall be investigated by subjecting the requisite number of specimens to all the applicable tests as described in Sections 30 – 41."[1] These tests are done in order, as some of the tests will be dependent upon tests earlier in the series. These tests are mostly electrical in nature, such as power consumption and current leakage, as well as several non-electrical tests, such as normal temperature test.

Manufacturing and production line tests, as well as ratings, have very few tests and standards associated with them. Production line tests check the grounding and ability of the appliance to withstand voltage. Ratings merely determine the amounts and types of current under which an appliance may operate.

Markings determine the types of labels that appear on the product. A heating

[1] UL Standards

appliance must be permanently marked with the manufacturers name, catalog number, and electrical ratings in plain view. Products intended for a specific current type shall be so marked. Other markings are warnings of electrical shock.

The thermostat override section and the electrode type heating appliances section do not apply to heat guns, so this portion of the standard was disregarded.

Heat guns are allowed several exceptions in this standard. These are found throughout the standard, and exempt the appliances from certain tests, like the water spray test. The appliances are also exempt from certain markings; if the heat gun is marked "FOR INDOOR USE ONLY" then the marking specified in 45.30 of the UL standard need not be provided.

Particularly of note in this case, UL 499 states that:

"45.31 The instruction manual for a heat gun shall include the following or equivalent statements:

a) 'Hidden areas such as behind walls, ceilings, floors, soffit boards and other panels may contain flammable materials that could be ignited by the heat gun when workings in these locations. The ignition of these materials may not be readily apparent and could result in property damage and injury to persons.'"

This section is intended to be in the operator's manual of any heat gun appliance.

The operator's manual for the Makita thermocouple gun does state the equivalent in a section devoted to Paint Stripping. Almost word for word, the dangers are spelled out in the manual, as well as in the general guidelines on how to strip paint. Within the multiple warnings in the owner's manual and warranty information sheet it states this heat gun operates at a maximum temperature of 1100° F with no visual indication of temperature (no flame). The manual also lists eighteen caution statements - one being to prevent ignition of combustible materials on or near the workplace; another cautions operators to keep a fully charged fire extinguisher on hand. From the depositions of the workers, they did not have a fire extinguisher nearby, which is in direct violation of the operating instructions. While it is inaccurate to state whether or not the fire would have started if there were a fire extinguisher around, it is sufficient to say that the workers did

not follow the operating directions. Furthermore, the supervisor should have been supervising the workers in order to follow the directions and provide a fire extinguisher as stated in the operator's manual.

The manual goes into detail about how to operate the heat gun when working in particular conditions, including the application of paint striping. It clearly states the user should keep the heat gun moving in a back-and-forth motion, never pausing in one spot, which may ignite the board being stripped of paint or the material behind it.

The Plaintiff had a company called Forensic Engineering, PC research the heat gun to determine whether the heat gun was safe for stripping paint. The engineer at Forensic Engineering, Michael E. Shanok prepared the *Forensic Engineering Report*, in which he stated that a hornet's nest behind the façade was the probable origin of the fire.

In his report, Mr. Shanok states that even though the Makita heat gun model HG1100 meets the UL 499 standard, it is unfit for use in heat stripping applications because its operator's manual does not state safe temperatures, air flow settings, and distance to use it to strip paint.. He claims that the product does not prevent the user from setting the temperature to high for the application. The report also states that there is no provision for selecting a safe distance between the nozzle of the heat gun and the surface of the house's exterior. Mr. Shanok states other than these reasons listed there is no other information available to conclude the users of the heat guns were misusing the product.

Mr. Barracato, a fact witness for the insurance company, had seen hornet's nests on the scene of the fire. This is inline with the beliefs of Michael Shanok. In Mr. Barracato's deposition several interesting facts emerge. He states that there are two holes in the wood of the façade. When asked,

> "If the painters were using the heat guns in the vicinity of the two holes… and they held the heat gun in the area of those holes for a significant period of time, could the heat build up and travel inside those holes?"[2]

He replied that it was a possibility, and that the fire would then travel on the

[2] Barracato Deposition

interior of the house instead of the exterior, and break through the roof of the covered veranda. The fire behaved exactly as he described, leading us to believe that the fire started on the interior, by something behind the façade..

The deposition then moves to the hornet's nests that Mr. Barracato saw on the rafters of the master bedroom. He conducted a burn test on a nest, and concluded that it was very volatile, to the point that: "I had to drop it or throw it out, because it just flashed" referring to the quickness with which the nest combusted.

An expert says hornets' nests can start to decompose at a temperature of 212° F and can ignite at temperatures as low as 753° F. The report also states that most exterior house paints will soften sufficiently to be easily removed with a scraper when heated to a temperature of 380 to 450° F. It is therefore reasonable to assume if an acceptable heat was used for stripping paint (<450° F) a hornet's nest should not have ignited.

Figure 4.3 - Guns dangling from ladder

George Lockwood was the Newtown fire marshal when this incident occurred. When he arrived at the fire he noticed a lot of smoke filling the street and immediately started taking pictures.

During the course of the investigation he determined the origin of the fire was in the front of the house directly behind where the painters were scraping the paint off the house. He noticed two ladders with extension cords running up the ladders with the heat

guns still hanging around the ladders. He stated there were three workers, Edinaldo Da Silva, Werlei Bastistia, and Carlos Roborido, at the time he arrived. Of these three, Mr. Morales was the only English-speaking worker on the scene. Ron Weiser, the supervisor, was not at the scene when the fire occurred.

Mr. Morales related to Mr. Lockwood the events leading up to his arrival. In the process of using the heat guns to burn paint off the exterior, the house caught fire and they attempted to put the fire out with the nearby garden hose. One of the workers tried to call the supervisor on his cell phone; however, due to their location the cell phone would not connect the call. Finally, one of the workers went inside the house to use the landline to call 911.

Although George Lockwood was the fire marshal in charge of the investigation, he was not the first one to the scene. In fact, the Hawleyville district's fire engines were the first to arrive at the scene. William Halstead arrived soon after the engines, and as he was the only fire chief at the scene, took responsibility for extinguishing the fire. Mr. Halstead was not in charge of the investigation, but it is still important for him to report what he saw when he first got there as he arrived before Fire Marshal Lockwood. From the information provided to him by Halstead, Mr. Lockwood came to the conclusion that the heat guns and the persons operating them were directly responsible for causing the fire. This was stated in his deposition as well as the Fire Investigation Report he made on September 15, 1997.

Three days after the fire, Fire Chief William Halstead and Fire Marshall George Lockwood met with John S. Barracato, an insurance investigator. Mr. Barracato specializes in fire and fraud investigation to determine the cause and liability of fires. In Mr. Barracato's *Initial Structural Fire Investigation Report,* he goes into a brief description of the building. The main section of the building was constructed in the early 1800's while the two additions were constructed in the mid 1900's. He also goes into the exterior and interior observations and the details of the fire damage. According to his report he found a number of hornets' nests, of which he took two photographs. In one of these photos Mr. Barracato finds a wasp's nest located above the ceiling of the master bedroom on the west side. In another photo, there is an arrow pointing to a hornet's nest that was located in the roof above the master bedroom.

As stated earlier from Mr. Barracato's deposition, he took one of the hornet's nests, which was not active and conducted a basic combustion test. Taking a cigarette lighter to the nest, ignition was instantaneous. The nest could easily combust and therefore was a very likely cause of the fire. As a result Mr. Barracato concludes, "That this fire is accidental in nature, caused by radiated heat from a Makita Thermocouple Heat Gun, probably igniting a hornet's nest."

A major discrepancy in Mr. Halstead's deposition exists, making us doubt the accuracy of his investigation. As described in Mr. Barracato's *Initial Structural Fire Investigation Report* he mentions that Mr. Halstead "noticed a large number of hornets swarming around the under portion of the roof." Mr. Barracato's also confirms that Mr. Halstead had told him he noticed the bees nest in their meeting three days after the fire. The problem arises in Mr. Halstead's deposition when he is repeatedly asked if he saw any hornet's nests around the house. He answers no to all of these interrogatories. He states he didn't even see heat guns on the ladders. In Figure 4.3 we see the guns hanging from the ladder, so we know that he is not remembering everything clearly.

It is also important to note that this deposition occurred on 5/31/2001. The fire occurred on 8/5/1997. The depositions was held four years after the fire, and it is very possible that Mr. Lockwood would not remember small details of a fire that occurred four years ago, especially when he deals with fires so often. This was seen in our video summaries in which it is shown how people's memories can start to lose details of an incident over time.

### 4.4 Final Assessment

After reviewing the depositions, photographs, engineering reports and conducting our own experiments, it is our belief that the fire was caused by too much heat entering the crawl space behind the façade. This heat, facilitated by the holes in the wooden clapboard, caused a hornet's nest to ignite. The flames then traveled underneath the roof, until the workers, who unsuccessfully tried to extinguish the blaze before calling 911, noticed them.

Ron Weiser, owner of Magic Brush, is primarily responsible for the damages done to Stephen and Betty Kahn's home on August 5, 1997. We believe the he failed to

inspect the house in a thorough and safe manner pursuant to the terms set forth in the manual. From Ron's own mouth he attests to not having read the manual, as well as not having checked the crawl space. We feel that Magic Brush is guilty of negligence and fully responsible for all damages done to the Kahn's residence.

# 5. John and Dorothy Quatrochi V. P.J.D.R, Inc., and Sears, Roebuck and Co.


Figure 5.1 - Craftsman 2.5 Horsepower Table Saw

## 5.1 Background

This case involves an accident with the operator of a table saw. The Best Holiday

Travel Park in Lewiston, Florida employed John Quatrochi. He was there to do general maintenance of the campground. On March 17, 1999, John was operating a Craftsman power table saw cutting a thin piece of wood. He commonly used this table saw and other power tools to make repairs around the campground. This table saw was located in one of the campgrounds sheds. One of the four legs supporting the table saw had fallen through the floorboards causing the table saw jerked upwards during use, and the spinning blade caught Mr. Quatrochi's left hand. As a result, he lost portions of his three middle fingers. Mr. Quatrochi is seeking damages from the campground owners, P.J.D.R., Inc. distributor of the table saw, Sears, Roebuck Co., Inc., designers, and Rexon Industrial Corporation, manufacturer of the table saw. He seeks these damages on the grounds of negligence. Damages sought are of an unknown amount due to the pending medical bills that were never fully documented.

**5.2 General Accident Description**

The craftsman table saw is a 2.5 horsepower table saw capable of 5000 R.P.M equipped with a 10" blade. In this case, it was being used to rip a 1 inch by ¾" portion of a board for the campground which he worked. A rip is a type of cut in which the blade cuts along with the grain of the wood, as opposed to a cross cut which cuts across the grain of the wood. The picture below shows a cross cut using the craftsman table saw.

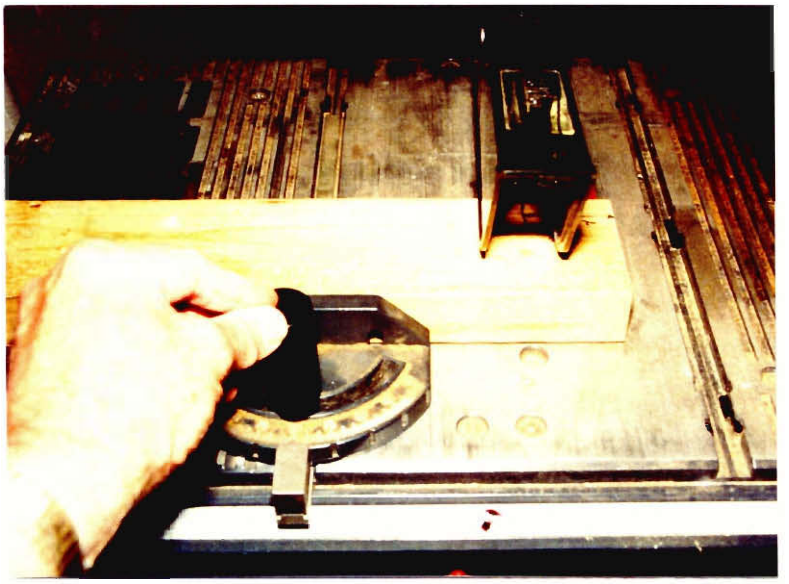

Figure 5.2 – Cross Cut on a Table Saw

At the time of the accident, Mr. Quatrochi was rip cutting a board measuring approximately 3 inches by ¾" inches by 22 or 24 inches long. He was trying to cut this to a dimension of 1 inch by ¾" by 22 or 24 inches long. In other words, he was cutting the 3" inch dimension down to 1 inch. He was making his last cut when the accident occurred, using a push stick with his right hand as suggested by the manual. His left hand was on the left rear corner of the board with his left hand thumb pushing on the rear of the board. This was to keep the board up against the rip fence in order to cut a straight line. With somewhere between two to five inches left to cut, the table saw's leg fell through the floor. As this leg fell through the floorboard the front right of the table saw shifted upwards. Mr. Quatrochi let go of the board slightly and the pressure of his hand that was no longer was applied to the board caused his hand to move towards the blade. This natural reaction could not be stopped in time to prevent injury. As the table tilted backwards, the force that was being exerted by his right hand through the push stick would cause the board to shift slightly upwards. With his left hand slightly eased at this time, the board is allowed to fall over the back of the table saw and was found afterwards on the ground, cut incompletely.

The expert witness report by L.D. Ryan, Ph.D., P.E examined Mr. Quatrochi's reaction time to this event. It states that

*Response Time = Perception/Decision time + Reaction time*

Not only is Mr. Quatrochi's physical reaction time important, but also his perception time to the event as well as his decision time to physically decide where to move is equally important. His response time is then the factor that is examined. While the details of the report are not given here, a report states that the response time of Mr. Quatrochi's hand movement was almost two seconds. The amount of time it would have taken his hand to move 2 inches to the blade is most likely not going to be greater than his needed response time of two seconds. While no particular data is available in this case to verify the amount of time needed to move his hand, we believe that Mr. Quatrochi would have done the best of his ability to move his hand out of the way. Mr. Quatrochi does not have any disabilities that would slow his reaction time.

### 5.3 Investigation and Analysis

Mr. Quattrochi had previously used this and other table saws before and was familiar with the operation of table saws. This particular table saw made by Craftsman is a small popular table saw designed for small cuts such as the one Mr. Quatrochi was making. The table saw can employ different kinds of blades for different styles of cutting. The electric motor driving the blade was a 2.5 horsepower motor that spins the blade up to 5000 RPM by design.

While developing a product, a third party is sometimes involved in the process, as there are different regulations that are required to put a product out onto the market. Other times the involvement of a third party is recommended to guarantee a certain level of safety in legal battles. The committees that are involved in the particular industry devise standards that are well known and recognized. This fact can be seen in many of the video summaries. It is shown how effective it is in court to let the jury know that these standards are industry wide standards and generally accepted everywhere, and therefore by meeting them the design is not at fault. This is the attempt made by the defendant Sears and Roebuck Inc.

The plaintiff, John Quatrochi, is claiming that negligence was a contributing legal cause of the incident on the following points:

A.) Defendant P.J.D.R., through its employees, was negligent in maintaining the campground.

B.) Defendant Sears Inc. sold a defectively designed and manufactured saw that was unreasonably dangerous.

C.) Defendant Rexon Industrial Corporation manufactured a defectively designed and manufactured saw.

As a result of all three points made above, the plaintiff suffered severe and permanent injury to his hand. The following report will investigate the design and manufacturing standards and quality of the Craftsman Model No. 137.221960 table saw that was used in this case. This case had been settled out of court so the available documentation was limited specifically regarding the condition of the shed floor. The shed has since been destroyed making it impossible for later investigators to investigate the conditions.

The plaintiff claims the cause of his injury poor design and manufacturing. It is the purpose of general design standards to guarantee the product is safely designed and safe to operate. This table saw claimed to meet two standards, the UL 987 listing and the ANSI 01.1-1975. The UL 987 is an Underwriters Laboratories standard for Stationary and Fixed Electric Tools. These are generally electrical requirements the product must meet. The latter is the American National Standard on Safety Requirements for Woodworking Machinery. These documents specify the requirements for a woodworking machine for safe operation as well as installation, and maintenance. The guard included with the Craftsman table saw was a standard hood type guard, which claims it meets the UL 987 and ANSI 01.1-1975 and OSHA standards.

Although the Underwriters Laboratories are generally electrical requirements, this standard also mentions some requirements for power tools in general and specifically table saw guards. The UL 987 requirements state that the guard should be able to be removed without the use of a tool and it must be able to be replaced. The requirement

states that the guard must enclose the moving part capable of causing injury.[3] The guard also should consist of a hood, spreader and an anti-kickback device. However, , an exception states that this does not apply to the cutting edge of the saw blade.[4] This makes sense since the guard cannot be too restrictive as to not let the intended wood to pass by the cutting blade.

The ANSI 01.1-1975 is the Stationary and Fixed Electric Tools that the table saw claims to meet. Again this standard includes safety design procedures for most types of power tools. This is a fairly old standard, developed in 1975 however it was the latest edition at the time of development of the table saw. Section 6 of ANSI 01.1-1975 is devoted entirely to table saw while section 6.1 describes the requirements for "Circular, Crosscut, and Swing Cutoff Saws; Ripsaws, and Resaws".

In these sections basic requirements are set forth much like the ones in UL 987. An important requirement in this case is shown below.

> *Each circular hand-fed ripsaw shall be provided with a hood-type guard that will cover the blade at all times when the blade is not in use. This may be accomplished by the use of a guard that will automatically adjust to the thickness of the material being cut, or by a fixed or manually adjusted guard. If a fixed or manually adjusted guard is used, the space between the bottom of the guard and the material being cut shall not exceed 3/8 inch if 1-1/2 inches or more from the blade, and ¼ inch if closer than 1-1/2 inches.*[5]

From the requirement shown above, we determined the standard hood type guard that comes with the table saw is, by design, sufficient to meet ANSI standards. Also note that it only lists few actual requirements. A great deal of leeway is available to the designer as to what kind of guard they would like to implement. It gives some possible suggestions such as a fixed or manually adjusted guard therefore leaving both the hood type guard, and other types of guard such as the Brett guard available to designers.

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[3] UL 987 Para. 28.4
[4] UL 987 Para. 28.4 Exception No.1

The ANSI and OSHA standards state the following: "Each circular hand-fed ripsaw shall be provided with a hood-type guard that will cover the blade at all times when the blade is not in use".[6] This says indirectly that the guard does not have to be in place while the blade is in use. The part the Ryan Engineering's report disagrees about is "Each hand-fed circular ripsaw shall be provided with an anti-kickback devices so located as to oppose the thrust or tendency of the saw blade to pick up the material or throw it back toward the operator".[7]

Ryan Engineering's argument is simple. At no place in the standards documentation does the requirement mention that this anti-kickback device has to be in place only when the blade is *not* in use. Instead, they argue, the anti-kickback device must always be available. According to ANSI and OSHA taking the guard off the table is acceptable, however the requirements do not explicitly state the same is true for the anti-kickback device. By taking the guard off the table saw there is no longer an anti-kickback guard, which Ryan Engineering's report argues would violate the ANSI and OSHA requirements. It is somewhat impossible to have an anti-kickback device without it being called a guard. While this type of argument can very well be made in court, it is most likely an interpretation of the wording. This seems to be one of Ryan Engineering's most valuable points, and we do not believe it holds any value to the question of faulty design of the table saw.

In summary of the standards, we believe the table saw was designed in accordance to the UL 987 and ANSI 01.1-1975 requirements at the time of design. The two standard committees stamped this product for approval based on their own research of the product.

Mr. Quatrochi claimed negligence on the actual manufacturers. While not much detail was given in the provided documentation about the details of the negligence, we still researched the subject.

Rexon Industrial Corporation manufactured the actual table saw and Sears was only the company to distribute the product. After the table saw is constructed, it is put through final inspection tests before leaving the manufacturing facility. The Final

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[5] ANSI 01.1-1975 Para 6.1.2.1
[6] ANSI 01.1-1975 Paragraph 6.1.2.1

Inspection Sheet tests checked out to be 100% okay. These tests include general specifications, durability tests, most specifications such as maximum RPM, as well as any cosmetic differences..

If the product had failed over time, there would be reason to believe the manufacturer is at fault. Therefore the table saw was sent back to the test facility where the table saw guard was to undergo more testing. These tests include the "running stall test" specified within the UL 987 standard. This test runs the table saw at maximum load for ten minutes while stalling the blade 12 times. Other tests that were checked after the accident were the "guard impact test" in which the guard is hit with a single five pound blow. No cracking of the guard occurred. Furthermore the guard was subjected to "aging tests" where the blade is placed in an oven for a specified time and at a specified temperature. The guard is then taken out and allowed to cool back down to room temperature. The "guard impact test" was run again, still showing no signs of distortion, cracking, etc. Overall, the testing afterwards proved the guard met the standards as well as showed no negligence on the manufacturer's quality of the table saw.

The table saw was then to be sent to both the plaintiff and defendant's private investigators. With exception to the table saw's guard, neither party responded with any specific design or manufacturing faults of the product.

A second requirement that was violated by the owners or operators of the table saw is in ANSI 01.1-1975 Paragraph 6.1.2.5 which states "Where a hood-type guard cannot be used because of unusual shapes or cuts, a jig or fixtures that will provide equal safety for the operator shall be used. On the completion of such operations, the guard shall be immediately replaced." The guard on this table saw was obviously not replaced after it was previously removed. However, this is not a violation of the design of the table saw, but instead misuse by the owner or user of the table saw.

An important issue in this case is the removal of this guard. We have spent some time proving the ANSI and UL standards were met and the initial manufacturing was satisfactory. Further, we showed the guard tests taken again after the incident. However, in this particular case the guard was not in use at the time of the accident. Mr. Quattrochi was using the table saw with no guard installed at the time. He had asked Rodney

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[7] ANSI 01.1-1975 Paragraph 6.1.2.8

Williams if he could use the saw in the shed. Mr. Williams told him it was okay. Mr. Quattrochi found the table saw with no guard on the table saw. This was the first time he was to use this particular table saw, but he claims he had used saws all of his adult life. However, he also states in his deposition that he has never used a table saw that actually had a blade guard attached to it.

While the absence of the guard makes the table saw even more dangerous, it is well known, even by the authors of the standard committees such as ANSI and OSHA that the guards are likely to be removed. The guards are often removed by the users because it is impossible to make a many types of cuts such as the following cuts: dado cuts, rabbet cuts, narrow cuts, zero clearance cuts, and often difficult to make partial cuts. Partial cuts are cuts in which the material being cut is feed into the saw blade and then pulled back out. Once the guard is taken off it is rarely put back on, usually because of the difficulty in moving or replacing the guard.

This violates another ANSI and OSHA requirement by owners or operators of the table saw. The requirement states "Where a hood-type guard cannot be used because of unusual shapes or cuts, a jig or fixtures that will provide equal safety for the operator shall be used. *On the completion of such operations, the guard shall be immediately replaced.*"[8] The guard on this table saw was obviously not replaced after it was previously removed. The last person to use the table saw, or even the person who originally took the guard off the table saw should see that it is returned in accordance with the standards. However, it is unknown who last used the table saw, or how long ago it was last used. Mr. Quattrochi stated that he had never seen the guard on that table saw. It is the responsibility of the maintainers of the campground to check up on their equipment.

The table saw instructions that came with the unit have an extensive section dedicated to safe operation of the table saw. The number one safety instruction listed here is "Always use saw blade guard." A short paragraph follows describing that the saw blade guard should be used for all through sawing operations as well as any other cuts that can be used with the guard. It also mentions the use of a push stick. A push stick is a piece of wood cut specifically to push the wood through the saw blade. This is often

[8] ANSI 01.1-1975 Paragraph 6.1.2.5

necessary when the user's fingers may reach to close to the saw blade. Mr. Quattrochi did properly use a push stick to push the piece of wood through the blade. Further safety tips are also included on electrical safety.

While we proved that the table saw's guard did meet the requirements, the question still remains, did the design engineers fail to pick a guard to provide adequate safety to the operator of the table saw? To investigate this we looked into other types of guards on table saws.

A noticeable weakness of the requirements for the guards is the ambiguity and lack of details of its requirements. We believe it is made this way in order to prohibit excessive restriction to design engineers, while still requiring all major safety requirements that one would expect. The committee who writes the standards most likely recognizes that most users take off the guard, and therefore are focusing more on other safety methods knowing that this usually is the case.

The Craftsman table saw used a generic hood type guard, which covers the entire saw. It lifts up in front to allow sliding the wood forward to be cut. Ryan Engineering's report mentions the use of a more effective guard called the Brett guard. According to this report, if this were to be used Mr. Quatrochi's hand would not have been exposed to the saw blade even if the table saw moved in the manner in which it did. The report also claims that if the Brett guard was to be used it may have not been previously been taken off prior to Mr. Quatrochi's use.

Our research of a Brett guard shows that it is a much safer type of guard for table saws. It is most likely that Mr. Quatrochi's hand would not have been subjected to the blade if a Brett guard had been used. However, the Brett guard is almost always sold as aftermarket guards. They are rarely incorporated into an original design.

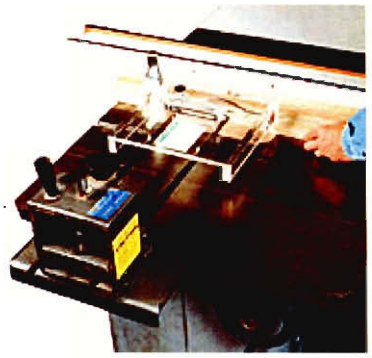

Figure 5.3 – Brett Guard

Investigations into the cost of an aftermarket guard to put on this type of table saw revealed it was quite difficult to find a Brett guard that would correctly fit this particular table saw. Not many places sold them, but when they were sold, there was a large assortment of different styles and sizes depending on the table saw it fit onto. They were quite costly: the price of a 30" Brett guard came to about $460.00 without taxes and shipping.[9] While the defendants can easily argue that a Brett guard is safer, it is not likely many users will buy a guard that is almost as much as the table saw itself. It is then also clear why the designers of the table saw did not elect to use this type of expensive guard. The additional cost of the guard may increase the price of the table saw much more than the manufacturer's intended selling price.

Splitters are also another safety device found on table saws. As wood is passed through the cutting blade it naturally wants to rotate clockwise on the table due to the force of the cutting edge of the blade coming down. A splitter impedes this force, eliminating kick back effects. Again splitters are usually found as aftermarket products and can take time to install to the users particular model. Splitters are not discussed in depth because a splitter would not have helped Mr. Quattrochi in his particular accident, as the material being cut did not kick back. Other types of guards that were found where designed for a particular vendor's table saw, usually much larger expensive table saws.

We were able to reconstruct the accident on a much older table saw. Here, in

[9] http://woodworker.com

figure 5.4, you can see the board which was 3 inches wide being cut down to a one inch section. The board width was ¾ inch. The leg went through the floor somewhere between 5" and 6" inches left to cut. The blade is shown somewhere in the middle of these two. The board is clearly hanging off the back of the table saw, and can be safely grabbed with a hand, provided you are not reaching over the blade, but instead standing to the side of the table saw.

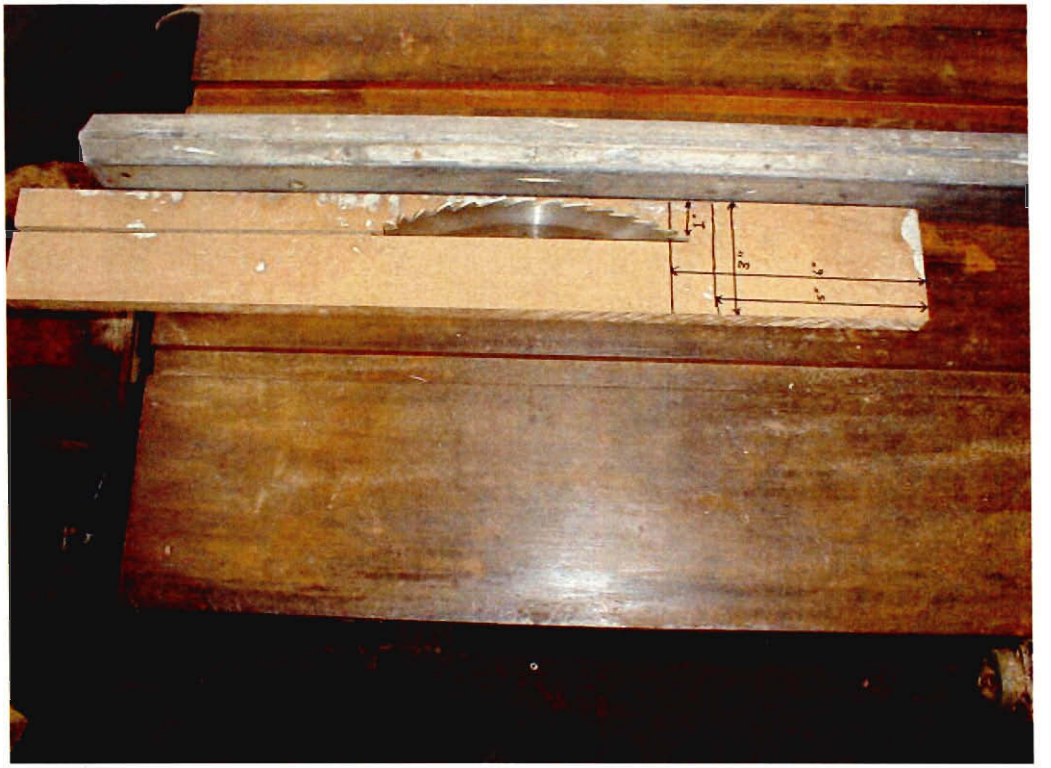

Figure 5.4 – Board Cut Before Accident Occurred

Another picture is shown below in Figure 5.5, illustrating an attempt to push the board through the blade. Once again, notice how the person is positioned on the side of the table saw, instead of in front of it. This allows the user to easily grab the back of the board, and not have to reach over the saw blade, which is very dangerous. While standing there, we believe that if the table saw fell while we were expecting it and not putting pressure on the board, then the user could react in time. However, while cutting a board, the user must put some pressure on the board to overcome the friction of the blade. Taking this, along with a sudden movement of the table, into consideration, it is foreseeable that this accident did occur. It is partially accidental that his fingers did

happen make contact with the blade. It is just as likely that the table would have tilted back, with his hand cleared from the blade in time. While this sounds as if the incident could be accidental in some respects, the user did not and should not have to assume the table will tip backwards without suitable warning signs.

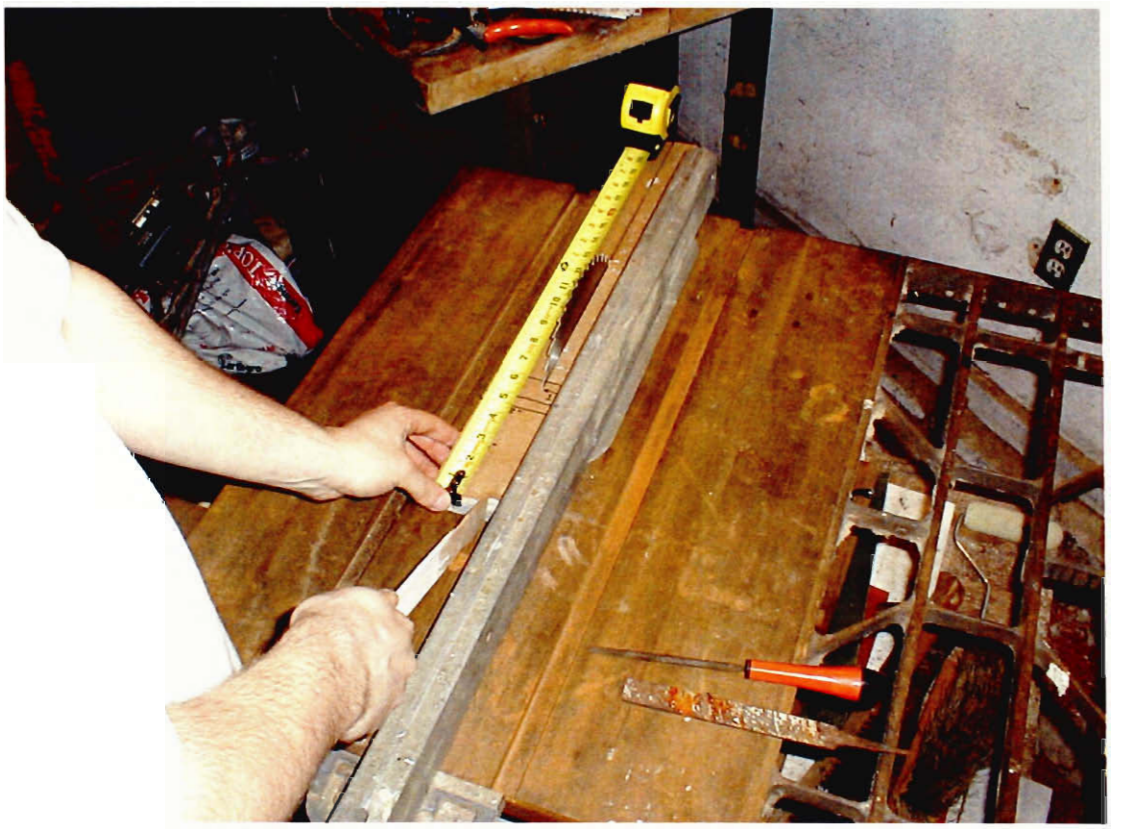

Figure 5.5 – Recreation of User Cutting the Board at the Point of When the Accident Occurred

The investigation of the shed's flooring is important because if it can be proved that the floor was inadequately maintained then the responsibility can then be placed on the maintainers of the campground, P.J.D.R.

In the manual of the table saw, it was clearly noted clearly to "position the saw on a clean, level surface".[10] There is no argument that the table saw was not set up correctly so we can safely assume the table saw was set up properly.

Mr. Roarke was the first person to arrive to the scene of the accident. He arrived and saw the left rear leg of the table saw in the hole in the floor. He also noted the saw

[10] Saw to Leg - Step 6, Page 9, Owner Manual

was running and teetering. He shut the saw off and brought the leg up out of the floor. He noted he was aware of the hole in the floor prior to the accident but it was smaller and believed to be caused by rodents.

Mr. Williams said it was clear that the floor of the shed was not safe. He mentioned it had been previously flooded many times and had started to rot. The defendant's engineering report attempts to show that numerous building codes are in violation. It states "existing structures are to be maintained in a safe and sanitary condition"[11]. It argues that this flooring of the shed had fallen into an unsafe building category. An unsafe "building structure or portion thereof as a result of decay deterioration or dilapidation is likely to fully or partially collapse". The wood that is used for construction must also be of "naturally durable or pressure treated wood".[12] Mr. Roarke said that he believed the floor was not constructed of treated lumber as required, but was instead regular wood. This also failed to meet the stated requirement.

### 5.4 Final Assessment

It is then our belief that the defendant, Sears Inc., designer of the table saw, is not liable on the basis of faulty design. The defendant, Rexon Industrial Corporation, manufacturers of the table saw, is not liable for faults in manufacturing of this particular product. It is our belief that Mr. Quattrochi was using the table saw in accordance to safety standards and could not help the accident from occurring. We find P.J.D.R guilty of not maintaining the campground in accordance with complete safety standards set forth by the Southern Standards Existing Building Codes, and for failing to maintain adequate safety devices for power tools. However, much of the crucial evidence needed for our formulation of opinions has been demolished with the shed. The evidence available to us is inconclusive to determine a liable party completely responsible. As a result , we find the campground 50% liable for their lack of maintenance of their Best Holiday Travel Park campground and the other 50% not liable based on the lack of crucial evidence.

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[11] Southern Standards Existing Building Code
[12] Southern Standards Existing Building Code Section 2304

6. : Jose Miguel Carballo Rodriguez, Hector Manuel Lopez Irizarry, pro se and on behalf of his minor children Hector Manuel Lopez Cruz, Sacha Ivelisse Lopez Cruz, Jose Luis Lopex Cotto, Maria Mercedes Lopez Melendez and Jose Oscar Lopez Melendez, Hector Ivan Lopez Cotto, Jose Danial Lopez Cotto and Carlos Manuel Lopez Melendez V. Clark Equipment Company, Inc.; Ingersoll-Rand Company; Dial Corporation; Volvo Construction Equipment North America, Inc. and A,B,C,D and E Companies.

Figure 6.1 - Lima Model 700-TC

## 6.1 Background

This case involves the question of product liability on the main brake hoist of a Lima Model 700-TC Serial No. 3689-5 crane. Clark Equipment sold this particular crane to Casco Sales in Puerto Rico on June 22, 1974. One year later it was resold to Redondo Construction, where it was put into use in San Juan on Pier 4 moving concrete moulds. The accident took place on December 8, 1990 at this location. Three workers were involved with the accident; two were injured and a third was killed.

For the liability in this case, it is important to know the history of the sales corporations involved. Prior to April 30, 1971, Baldwin Lima Hamilton (BLH), owned by Armour and Company, designed, serviced and sold Lima Model 700 T cranes. On April 30, 1971, Clark Equipment purchased the assets of the Construction Equipment Division (CED) from the Baldwin Lima Hamilton Corporation (BLH) for approximately $46 million. Clark continued to sell and service cranes of the Lima brand name. At this time Clark owned all of the facilities, inventory, customer lists, and patents and trademarks. When Clark bought the CED division from BLH both parties signed a "Purchase Agreement" which was signed over to Clark in Chicago, Illinois.

In this agreement BLH and Armour relieve themselves of any liability of products that are sold by Clark after the date of purchase. All products sold before this agreement are still the responsibility of Armour and BLH. Since then, Armour has become The Dial Corp through merging with other companies and name changes. In a separate agreement between Armour and Dial, Dial assumes all of Armour's liabilities for any defective products produced by the division.

In short, Clark assumed any liability claims by any products it sold after April 30, 1971. Before this date, Armour would have claimed the liabilities, but Dial is now responsible for all claims made against Armour.

Since Clark had purchased CED, more than fifty product liability cases have been brought against Clark. Almost all of the cases used the products date of sale to determine if Clark was responsible or not. Clark continued to provide Field Service Engineers who

would service a Lima product regardless of who designed it, thus providing continuing support for all Lima products. This case was brought up against Clark Equipment Company. The Purchase Agreement between Armour, BLH and Clark is important to determine if the plaintiff has a suitable case against Clark.

In this case Clark sold a Lima Brand, Model 700-TC Serial No. 3689-5 crane to Casco on June 22, 1974.

### 6.2 General Accident Description

On December 8, 1990, Mr. Bracetti was the operator of the crane prior to the accident in question. Mr. Bracetti had left briefly to go to the bathroom when Santos Lopez-Irizarry assumed operation of the crane. Construction continued as normal while Mr. Bracetti was at the bathroom. Some time into Santos Lopez Irizarry's operating stint, the four-ton concrete form that was being lifted fell four to five feet to the ground. It landed on and seriously injured one of the plaintiffs, Jose Miguel Carballo-Rodriguez, who was under the load at the time it dropped.

While Rodriguez was trapped under the form, his co-workers urgently signaled to the crane operator at the time, Santos Lopez-Irizarry, to lift the load. It was his co-worker and second plaintiff, Hector Manuel Lopez-Irizarry who signaled to the crane operator, Santos Lopez-Irizarry, to hoist the mould again.

After the load had been lifted from Rodriguez, Mr. Hector Lopez-Irizarry and William Moreno came to his assistance in an attempt to extract him from under the concrete form. Santos Lopez-Irizarry states in a sworn statement that he was trying to lock the brake pedal, but he was unable to do so. He claims his foot slipped from the brake pedal causing the load to drop for a second time injuring Miguel Carballo-Rodriguez and killing William Moreno.

### 6.3 Investigation and Analysis

One way a lawyer can successfully argue a liability case is to use previous examples of similar liability cases. This case commonly references a number of older liability cases that deal with other Lima cranes. This "Purchase Agreement" was shown to be very important to determine the liability between Clark Equipment Company and The Dial Corp.

In 1984, a Model 700-T Lima crane injured John Morrie when the hoist brake pedal slipped and allowed the suspended load to fall on top of him. For the purpose of this short summary, we will assume there was sufficient evidence to prove that the hoist brake pedal had failed. In this case, the crane was designed, manufactured, and sold by BLH, prior to the Clark purchase of BLH. Morrie sued both Armour and Clark for his injuries. Armour was dismissed from the case, and Clark was dismissed except for one aspect. Dial filed a Motion to Amend Complaint, which claimed that, "Clark had negligently failed to warn users of the crane about that defective and dangerous condition."[13] Dial said it no longer had to defend itself in the Morrie case. Clark ended the lawsuit by settling the case out of court, paying John Morrie and his wife $450,000.

As a result of this, Clark Equipment Company later sued the Dial Corp on January 7, 1993 for the cost of the out of court settlement, $450,000 and the $10,000 of additional expenses for defending themselves against Dial's claims. Clark filed an Amended Complaint in three counts. The first count deals with the Morrie case specifically. The second count deals with the interpretation of section 5.9 of the purchase agreement, and count 3 does not deal with Dial Corp.

Count 2 deals with the interpretation of the Purchase Agreement. In this Purchase Agreement signed by Armour, BLH, and Clark it clearly states that Armour and BLH "jointly and severally agree to defend, indemnify and hold harmless Clark…against all claims, demands, causes of action, suits, proceedings, judgments, decrees, debts, liabilities, court costs, legal feed and expenses of any kind…(1) arising out of the conduct of business of CED…prior to the closing date". Further, Clark agreed to "defend, indemnify and hold harmless Armour and BLH against all claims, demands, causes of

action, suits, proceedings, judgments, decrees, debts, liabilities, costs, legal feeds, and expenses of any kind whatsoever (1) arising out of the conduct of the business of CED…on and after the closing date…"

"For the purpose of this, product liability claims shall be deemed to arise out of the conduct of the business of [the division which is the subject to the Purchase Agreement by the party selling the equipment or part to which the claim pertains."[14]

The Dial Corp had also accepted all product liabilities of Armour and BLH when they had merged. We feel that Dial had violated their purchase agreement by not defending Clark in the Morrie case as stated in the Purchase Agreement. Clark left the Lima crane business in June of 1985. Later that year, VME acquired the Lima parts business from Clark. VME assumed all liabilities of the Lima crane division of Clark.

In the Caraballo case, the crane was sold by Clark Equipment Company to Casco Esi Equipment Inc., on June 22, 1974. Casco then sold the crane to Redondo Construction, who owned and operated the crane at the time of the accident. The purchase agreement between Clark and Armour took place in 1971, three years before the sale of this crane, making Clark is legally responsible for any liabilities regarding the sale of this crane according to Clark v Dial.

On August 15, 1984 the Lindley vs. Clark lawsuit was filed, only two months after the Morrie accident, and six years before the death of William Moreno. The plaintiff, Horace Lindley, claims the beam fell "as a result of a defectively designed hoist brake mechanism on the crane."[15] Since the accident, Dial had owned Clark's Lima division and stated that the Lindley incident was similar to the Morrie accident and that the hoist brake mechanism defect is almost identical to that involved in Morrie. This is important because the crane used in the Lindley case is identical to the 700-TC crane used in this Carballo case.

In the pre-trial order they listed eight specific issues of facts to be decided by the jury:

1.) Whether the crane manufactured by the defendant had a defectively designed brake latching system.

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[13] Motion to Amend Complaint Count VI – Negligence – Clark Equipment Company
[14] Section 5.9 of the Purchase Agreement

2.) Whether the design of the hoist brake indicator is defective.
3.) Whether the product is defective for failure to warn.
4.) Whether the product is defective because of alleged post sale failure to warn.
5.) Whether the plaintiff has been damaged for loss of income, temporary or permanent injury, pain and suffering, and mental anguish, and special damages for medical expenses, and the amount of each, if any.
6.) Whether the defendant's acts amounted to a gross disregard for the rights of others entitling the plaintiff to exemplary damages.
7.) Whether or not the product was misused.
8.) Whether or not the plaintiff assumed the risk of a known defect.

Most of these issues of fact pertain directly or indirectly to the case in San Juan on Pier 4. Most notably this case shows another example of an accident caused by a faulty hoist brake latch, the same problem as the crane in San Juan. Almost word for word the allegations and issues of fact are the same in both cases.

Furthermore, all of the Lima Model 700 series have the same type of hoist brake latch mechanism. When the operator attempts to hold a load in the air he depresses a foot pedal and then rotates it with the toe of his foot and secures in the latched position. The foot pedal engages a hook to lock around a fixed latch pin. However, the braking mechanism sometimes fails, although it would appear to the operator as though it had latched. When not fully engaged in a secure locking position, the hook does not fully lock around the pin but instead the tip of the hook balances on the pin. In such an unstable position the hook could eventually vibrate off the pin, causing the brake line to disengage entirely, allowing the crane's load to go into freefall.

Below, in Figure 6.2 we show two pictures of the foot pedal, one with the pedal up and the other with the pedal down which engages the brake.

[15] Lindley vs. Clark Joint Pre-Trial Memorandum: Plaintiff's Claims, page 1

**Brake Not Engaged** **Brake Engaged**

Figure 6.2 - Brake Pedal

Below we show a view of the space underneath the operator's cabin where the latch and pin is located. (Figure 6.3). To get a sense of orientation, the next two pictures of the latch are taken above the latch, looking down from the white arrow.

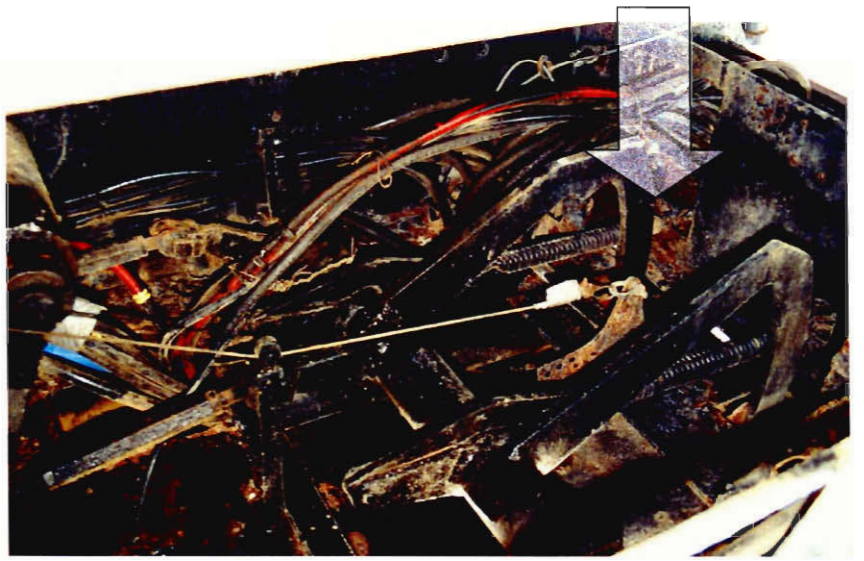

Figure 6.3 - Underneath Operator's Cabin

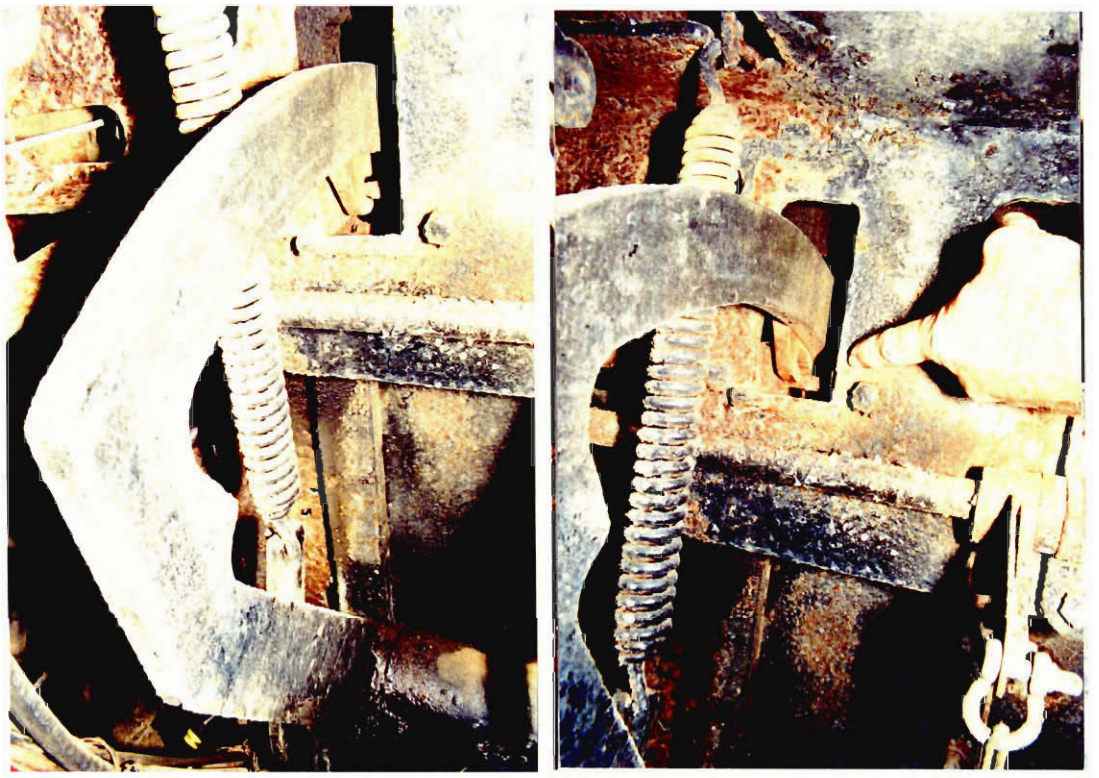

Figure 6.4 – Properly Latched and Improperly Latched

Wayne W. Kinzie was the person that discovered this false latching condition in the hoist brake latch mechanism of the 700 series crane. He did this while working as a service man for Clark.[16] Further evidence of the faulty design can be found in multiple service engineers' daily reports. The reports contain details pertaining to faulty latching conditions of the system. From this, it is clear that Clark realized there were potential problems with this latching system. They had received multiple complaints and lawsuits against them. Complaints regarding this false latching condition continued throughout the years. Several months after the Morrie case, another complaint was made regarding the brake pedal not latching properly. These complaints continued without any engineering design fix by Clark. Some of these cases turned into lawsuits and some were forgotten. If

[16] Clark Equipment Company's Memorandum In Response to Dial Corp's Motion For Partial Summary Judgment, pg 18

a suitable design fix had been explored, the field service engineers called to service the crane could have implemented the fix and accidents may have been avoided. As shown, it is clear Clark had suitable knowledge of problems with the hoist brakes on their Model 700 cranes. It will be shown that Clark was negligent in not providing a solution to this faulty condition.

Baldwin Lima Hamilton Corporation employed Wayne Shaw since the early 1950s. In 1971 he started to work for Clark when Baldwin Lima Hamilton Corp was sold to them. He started there as assistant chief engineer, and then later moved up to chief engineer. His new position placed him in charge of all design and engineering facilities of the Lima Division, including the hoist brake system. He states in his deposition that all the hoist brake systems that used the hook and latch mechanism on the model 700 Lima cranes were similar and all were designed by Baldwin Lima Hamilton Corp.

On January 1985, Clark's Lima division was transferred to Clark Michigan Company, which changed names to Volvo BM Michigan Euclid America Inc. or VME. It is now know today as Volvo Construction Equipment North America Inc. In their purchase agreement, VME assumed all of the liability claims that arose from Clark's Lima division. Volvo also assumed Dial's liabilities. Volvo admitted to defend both Clark and Dial and therefore the question of which company is liable does not arise such as in the Morrie case.[17]

In 1985, Wayne Shaw suggested issuing a warning label about the false latching of all the model 700 Lima cranes, and on September 16, 1985, he developed a typical warning label and sent a notice to John Cary, Clark's attorney for product liability cases. In the letter he states he doesn't "know how we would physically find the cranes to have the decal attached-we will just have to give it our best shot and work out some kind of procedure-if we decided it was in everyone's best interest to do so."[18] John Cary elected not to use a warning label and asked Mr. Shaw to instead try to fix the design.

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[17] Volvo's (VME) Response to Plaintiff's First Set of Interrogatories, Response 3
[18] Wayne Shaw's letter to John Cary, December 16, 1985

This design change never happened while Clark was in business.

Mr. Shaw had the authority to make a design changes as chief engineer and we feel it was negligent on his part to not attempt to look into such a change. While it is understandable that finding all the cranes may be difficult, there are a number of crane owners that had filed complaints against this very thing and Clark knew the location of those cranes.

Another idea to remedy this false latching condition was to sharpen the end of the hook to "reduce the likelihood that it would balance on the edge of the latch." While this solution may have improved the situation, it is certainly not an adequate engineering design solution. Instead it is a roundabout way to decrease the probability the hook gets improperly latched.

During the deposition of Mr. Shaw he was asked about other designs that could have been used for the brake hoist latch. He was directed towards an alternative design called a ratchet system where the ratchet is a notched wheel on the drum with a lever that goes into it to lock it into place. When asked later in Mr. Shaw's deposition, Mr. Shaw said he did not know of any false latching condition on the ratchet system. This shows that Mr. Shaw does know of better design solutions but did not implement these alternative designs during his employment with Clark Equipment.

Further evidence that Clark knew of the existence of the defect in their main hoist braking system can be found in the three separate Service Engineers' Daily Reports and two logged phone calls that were brought up as evidence in the Lindley case

Five years later, on February 1990, instead of printing warning labels, a service bulletin was finally published by VME, and sent to distributors and service manager of VME parts. These warning decals were to be placed inside the cabin of the cranes directly in front of where the operator sits. The warning label is shown below in figure 6.5.

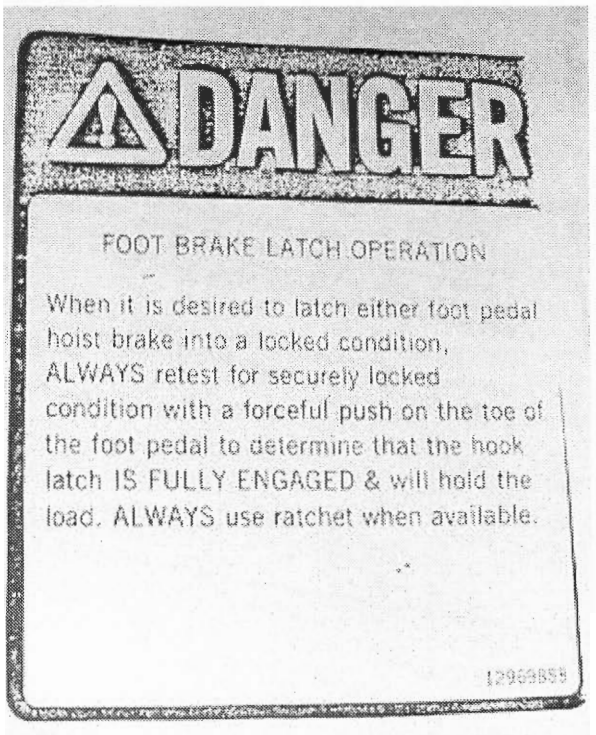
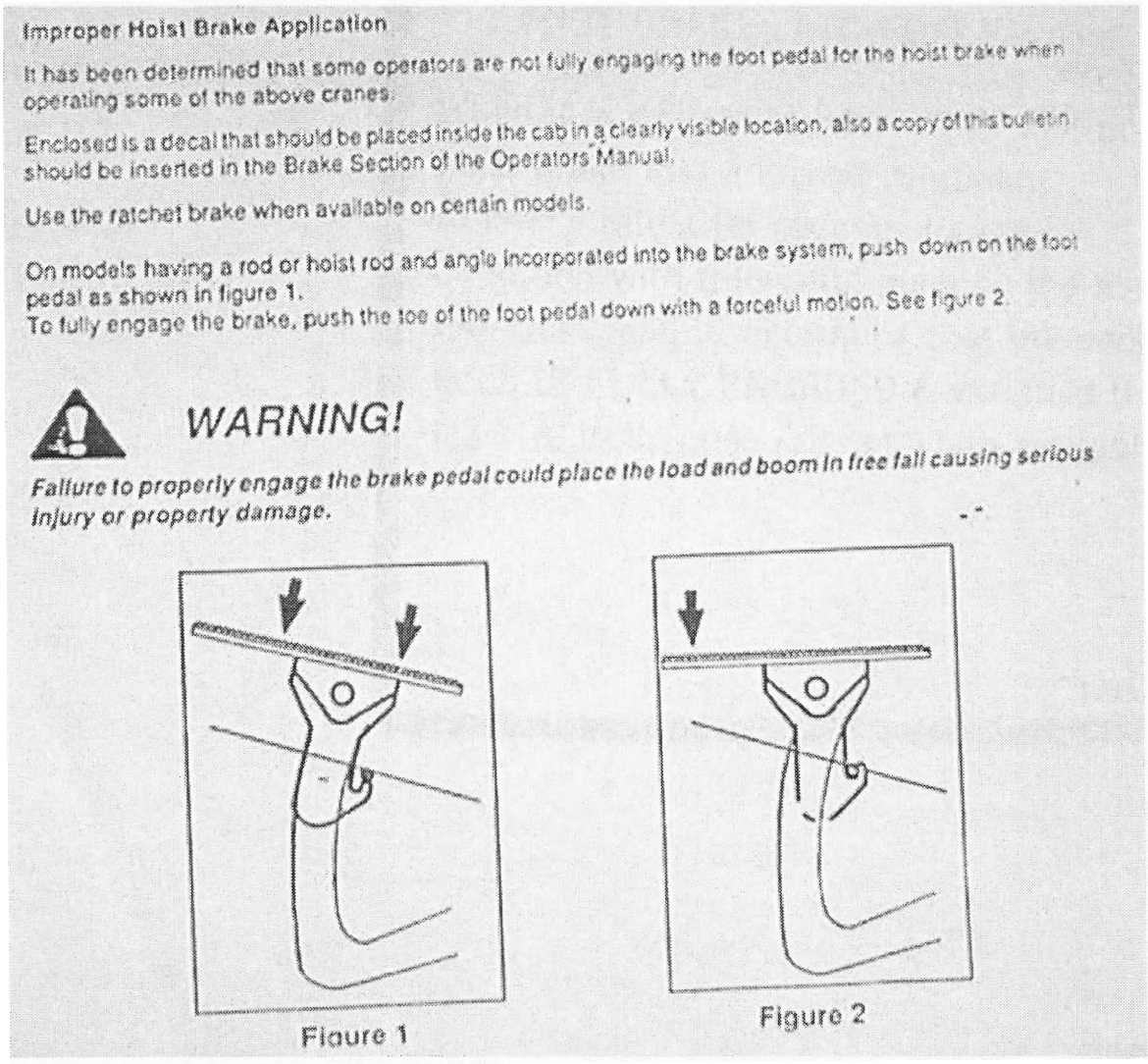



Figure 6.5 – Warning Label

Further, a service bulletin was to be inserted into the brake section of the operator's manual, which is shown below "WARNING Failure to properly engage the brake pedal could place the load and boom in free fall causing serious injury or property damage." Below this were two illustrations showing the brake pedal properly engaged and the other showing the brake pedal improperly engaged. This is shown below in figure 6.6.



Improper Hoist Brake Application

It has been determined that some operators are not fully engaging the foot pedal for the hoist brake when operating some of the above cranes.

Enclosed is a decal that should be placed inside the cab in a clearly visible location, also a copy of this bulletin should be inserted in the Brake Section of the Operators Manual.

Use the ratchet brake when available on certain models.

On models having a rod or hoist rod and angle incorporated into the brake system, push down on the foot pedal as shown in figure 1.
To fully engage the brake, push the toe of the foot pedal down with a forceful motion. See figure 2.

*WARNING!*

*Failure to properly engage the brake pedal could place the load and boom in free fall causing serious injury or property damage.*

Figure 1

Figure 2

Figure 6.6 – Service Bulletin to be inserted in Manual

Furthermore, "Clark had the means to inform the owners of all Lima cranes of these recently discovered defects…none of the Service Bulletins issued by Clark ever addressed the hoist brake problems…[in] any other Model 700 crane."[19] Under new supervision and ownership, VME finally got these warning labels out in 1990showing that it would have been possible for Clark to get a warning label or service bulletin out. Throughout the time Clark operated the Lima Division, they elected not to use a warning label, but instead opted to make a design fix. While Mr. Carry did decide an engineering

decision would be a better solution, nothing was ever done, due to Mr. Shaw's negligence on behalf of Clark. We also agree with Mr. Carry's decision. The warning labels issued later in 1990 are not a suitable solution to the defective design. We believe it is acceptable to be used temporarily while a new solution is being designed; but it is not sufficient to put a label on the inside of a cabin and claim the hoist brake defect is repaired.

Again, the warning labels were finally issued in 1990, and we believe that Volvo was just starting to realize that their design was defective and that for years Clark had wrongfully denied this fact. It was five years between the times Mr. Shaw first made up the proposal for such warning labels in 1985, until the time they actually were issued in 1990. Unfortunately these warning labels never reached Redondo construction due to the fact the crane had been sold and bought through a several different companies and Clark had records only for the original sale.

On September 6, 1989 Attorney E. Paul Kelly wrote a letter to Attorney John Cary about the Morrie case requesting $500,000 to settle the lawsuit out of court. In it, he describes, "One of the most serous difficulties facing us is the fact that Wayne Shaw has lost confidence in this particular crane. With almost no difficulty, he was able to recreate the accident situation on his first inspection of the crane…He balanced the hook on the pin on his first attempt and was obviously surprised that he was able to do so."[20]

He even states that his own expert witness Mr. Thune feels that the design is defective as the hook can be balanced on the pin without any indication to the operator that this has happened. The company also admits that they knew the location of this particular crane and could have fixed the problem, preventing the Morrie accident.

This is very strong evidence that the attorneys themselves realize the design is defective. At the end of the letter, Mr. Kelly even says he believes the defendants have no better than a 5 to 10% chance and the jury will award the plaintiff Morrie more than $700,000.

John Cary also stated in his deposition that there are no A.N.S.I or O.S.H.A standards that apply to the hoist brake latch. We disagree with this statement as in the

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[19] Memorandum In Support of the Dial Corp's Motion For Partial Summary Judgment and admitted in Dial Corporation's Response To Plaintiff's First Set of Request For Admissions, Response 36

USAS B30.5-1968 standards for the Crawler, Locomotive and Truck Crane, we found a section that states that the controls provided to the operator of the crane shall "be capable of holding the rated load indefinitely without further attention from the operator."[21] With a false latching condition, the latch can vibrate off the hook as shown in previous lawsuits and complaints, and thus does not hold the rated load indefinitely.

The most important thing for an expert witness to do is to become acquainted with the machinery. We had attempted to do this in the Heat Gun Case as well as the Table Saw Case. In this case it wasn't feasible to test the hoist brake mechanism on a Lima crane. Instead we turned to the report by the expert witness hired for the plaintiff in this case as well as the Morrie case, Dr. Raymond Hagglund, P.E. On August 25, 1985, he examined the hoist brake latch mechanism on the Lima 700-T crane that was involved in the Morrie case. In his Engineering Safety Report Dr. Hagglund was able to obtain a false latching condition on his first attempt. He thought he had a "proper latch because the brake pedal was held in a down position after I removed my foot." However, after looking under the cab of the crane at the latch pin, he saw "the hook was resting on the bottom rounded surface of the latch pin," and it was obvious that the "crane would drop a load if the tip of the hook slid off the latch pin."[22] Since this is the first attempt by Dr. Hagglund to achieve this condition, we believe that this does not meet the USAS B30.5 1968 standards to "be capable of holding the rated load indefinitely without further attention from the operator."[23]

While none of the members in our group are mechanical engineers, we looked into the mechanical drawings of the latch mechanism. Below in Figure 6.7 the mechanical drawing for the hook is shown.

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[20] Letter from E. Paul Kelly to John Cary, pg 6, September 6, 1989
[21] USAS B30.5-1968 Section 5-1.3.2 4
[22] Engineering Safety Report of Dr. Raymond Hagglund, P.E., pages 5-6
[23] USAS B30.5-1968 Section 5-1.3.2 4

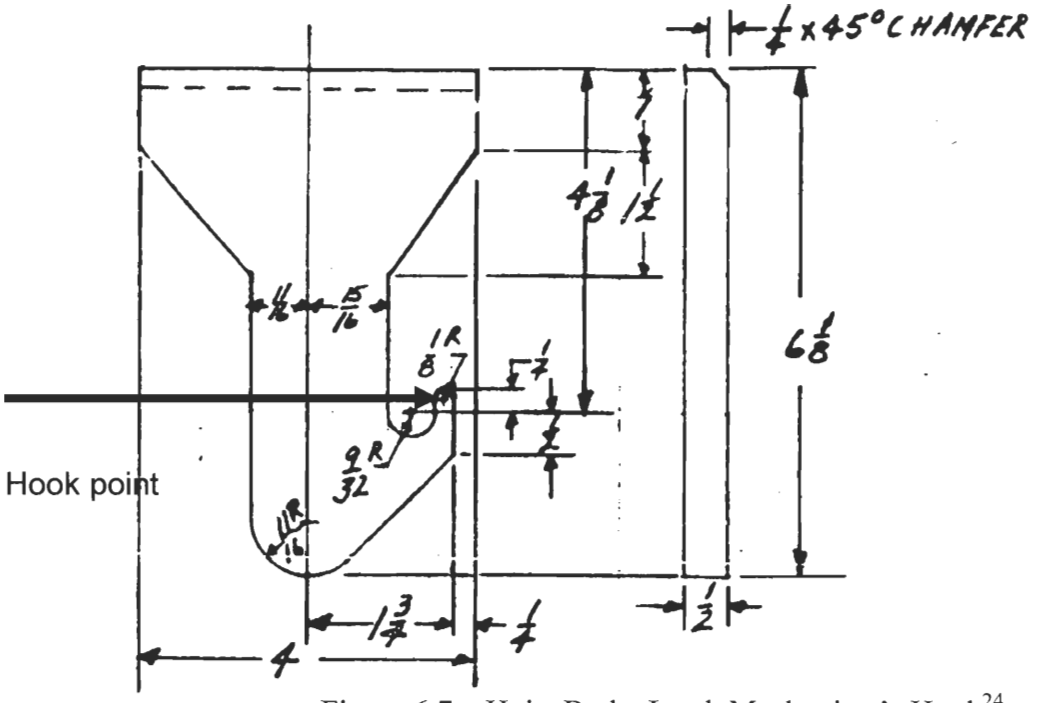


Figure 6.7 – Hoist Brake Latch Mechanism's Hook[24]

Note the arrow above showing the point of the hook where the hook balances on the hook. The hook is shown below in Figure 6.8.

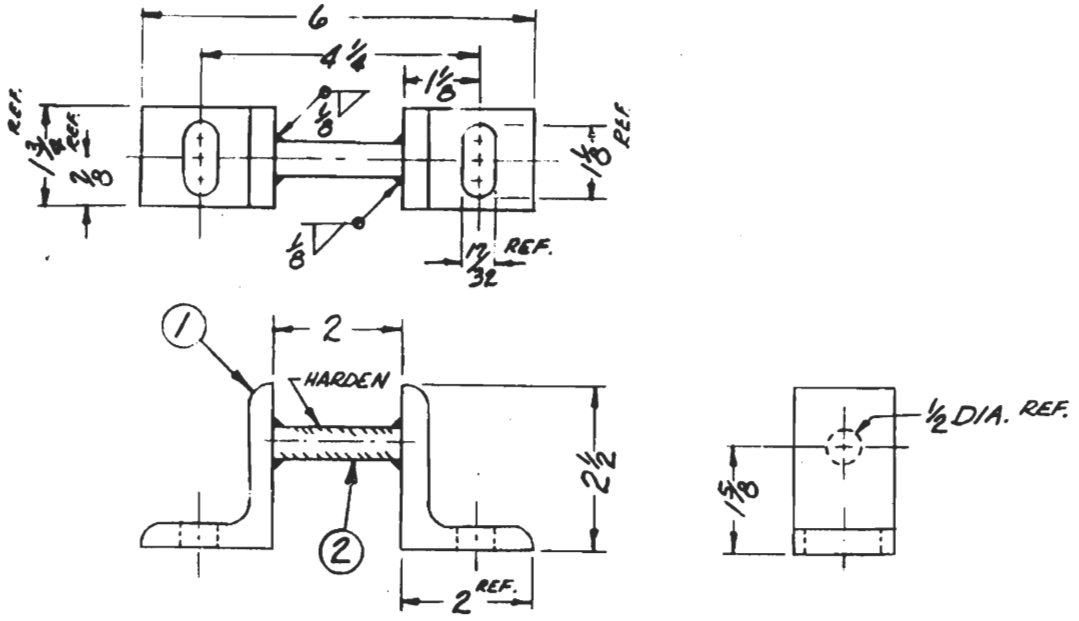


Figure 6.8 – Hoist Brake Latching Pin[25]

The latching pin's diameter is ½ inch. While the hook's drawing does not directly show the width of the pin's hook, we estimated it to be about ¼ inch. The details of the hook's edge are not given in the drawing so we were not able to have specifics about the dimensions, however it can be intuitively seen that if the hook's edge were flat, it would have about a ½ inch area it could balance on. The pin is rounded to some degree but the details cannot be determined from the drawings above. Clark's idea to sharpen the hook's edge looks like it would have worked but they neither tested this theory nor implemented it.

### 6.4 Final Assessment

There is no doubt that this mechanical latching system is defective. We have extensive evidence showing how an expert witness, Dr. Hagglund, was able to recreate this false latching on his first attempt. Volvo's lawyers were even surprised to recreate this false latching on their first attempt when they inspected it. There is no doubt that Clark and thus Volvo were well aware of the problem and up to 1990, simply ignored the problem; as such, accidents occurred that could have been prevented. However in deciding who should be responsible for the injuries we cannot look only at the defects, although we strongly believe if the defect had been fixed, this accident would not have occurred. This is not reasonable to say in court, and therefore we have to look at some of the faults of the workers who were hurt in this accident.

We believe that Mr. Carballo-Rodriquez and Mr. Lopez-Irizarry violated the USAS B30.501968 regulation by standing under the load. This obviously is not safe to do under any circumstances and is described so under the ANSI and OSHA regulations and standards.

We also found another OSHA guideline 1910.180, Materials Handling and Storage. The workers on the dock the day of the accidents were in direct violation of at least two of these OSHA regulations, which states "The operator shall not be permitted to

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[24] Clark's Mechanical Drawing No. 6016925
[25] Clark's Mechanical Drawing No. 388-477

leave his position at the controls while the load is suspended."[26] This was violated when Mr. Bracetti left to go to the bathroom. The very next OSHA regulation states, "No person should be permitted to stand or pass under a load on the hook."[27] This regulation was clearly ignored by all parties injured in the accident, both the first and second times the load fell. It is, however, somewhat understandable in this situation of panic that the other workers would by accident move under the load to help the injured worker.

We also have evidence that the crane was inspected before the accident and there was some reason to believe the crane was somewhat defective. On November 29, 1990, ten days before the Carballo accident, Paul Torres inspected the 700-TC crane. In his report he mentioned that the crane was in "good operating conditions," although the "latch of the pedal brake at times did not hook well but stayed in the border of the latch pin."[28] We find it hard to believe that the crane was said to be in good operating condition despite the fact that the latch hooked incorrectly. Due to this we believe the crane should have been more thoroughly checked to make sure it was safe to operate prior to using it for construction work. Further, if the construction company did elect to use it despite the defect, the workers should have been warned and therefore should have paid strict attention to the OSHA guideline to not walk under the load. Had the guidelines been followed, the crane still may have dropped the load, but there would not have been personal injury; though there still may have been property damage due to the weight of the load.

We have shown multiple records of complaints, lawsuits and letters between employees of Clark regarding this defect. We strongly believe there is more than enough evidence provided here to prove Clark was well aware of the problem. In fact, Clark was aware of the situation as early as September 13, 1973. However, Clark believes that this false latching condition can only occur to an inexperienced operator, and it is the operator's fault.[29] This has been their argument since the first case was brought against them and it allows them to state under oath that they do not know of any defects in their latching mechanism. We believe a latch capable of suspending seventy-five tons should

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[26] OSHA 1910.180(h)(4)(i), Materials Handling and Storage
[27] OSHA 1920.180(h)(4)(ii), Materials Handling and Storage
[28] Motor Crane Inspection Report by Raul Torres, November 29, 1990
[29] Wayne Shaw's deposition

be unable, under any circumstances, to have any false latching condition.

Through our analysis and investigation we find the hoist brake latch to be defective in design. Due to this defective design, multiple injuries have occurred in the past and continue to occur. We believe there is sufficient evidence to show negligence on behalf of Clark for not attempting to create a mechanical design solution to the faulty hoist latch. In 1990 VME attempted to put out warning labels about the latch, which shows the problem was recognized. But a producer has an obligation to change unnecessarily dangerous designs, rather issuing warnings about them. Finally, the injuries had occurred as a result of this defective design in the hoist brake latch when it improperly latched. In conclusion, we blame 90% of all injuries occurring as a result of this accident on the plaintiffs, Clark Equipment. The remaining 10% falls on the construction workers who had violated regulations and may have had some warning the latch was defective in design.

# Glossary

ANSI: American National Standards Institute.

Chattel: An article of movable personal property.

Defendant: The party against which an action is brought.

Deponent: One who testifies under oath, especially in writing.

OSHA: Occupational Safety and Health Administration.

Plaintiff: The party that institutes a suit in a court.

Tort: Damage, injury, or a wrongful act done willfully, negligently, or in circumstances involving strict liability, but not involving breach of contract, for which a civil suit can be brought.

Tortfeasor: A person who commits a tort; one who causes harm or loss for which a civil remedy may be sought.