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This thesis discusses the field of products liability as it relates to the electronics industry. The historical development of products liability is traced and the various legal theories are examined. These legal theories and background are then used to discuss the judicial obligations imposed upon the manufacturer and seller of equipment with regard to product development and marketing of the product.

The usual elements of a typical products liability case are presented and actions which the manufacturer or seller can take to avoid liability both before and after a case is filed are discussed. In the event that a products liability action is successful the damages awarded to the plaintiff are of significant importance to the manufacturer or seller and are therefore discussed.

Past decisions and stated objectives of the products liability field are used in an attempt to predict further developments in the field.
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by

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PRODUCTS LIABILITY IN THE ELECTRONICS INDUSTRY

I. INTRODUCTION TO PRODUCTS LIABILITY

Products liability is the field of law which relates to the liability of manufacturers and sellers of products for injuries or damage resulting from their products. The field is an outgrowth of several other branches of the law, most notably Tort (the field of civil wrongs not depending upon contract) and Contract, and therefore contains many elements in common with these branches of the law. The major general observation to be made regarding the field is that manufacturers and sellers can incur legal liability through their products and become subject to substantial damage awards.

In the past, electronic engineers and equipment manufacturers have had two essential goals in mind when designing electronics equipment. First, the electronics equipment must be capable of doing a particular task or family of tasks reliably and well, and second, the equipment must be economically sound. If either of these goals is not achieved, the product will likely be unsuccessful.

Legal trends within the past few years indicate the need for yet a third major goal for an engineer or manufacturer in the design of a piece of electronics equipment, namely that it be designed so as to absolutely minimize the chances that the users of the product might be injured or that property might be damaged through the use of it. Failure to achieve this goal may result in products liability suits against the designer, the manufacturer, the seller, or all of them.
with subsequent substantial money awards to the injured parties.

Products liability suits are presently exhibiting a tremendous growth rate in numbers and therefore require increasing attention. Products liability suits presently pose a threat to any manufacturer or seller of electronics equipment. Claims and judgments can run upwards of a million dollars and can spell financial ruin for an unprotected small company and significant financial distress for a large one.

Products liability protection for companies in the electronics field takes the form of one or both of two methods. First, a company can obtain protection by using such extreme care that no successful products liability action can possibly be prosecuted. Second, the company can obtain adequate insurance or self-insurance to protect it from any potential claims. Neither of the two solutions is totally satisfactory. Costs of obtaining completely comprehensive insurance is prohibitive as is the cost of insuring that no defects occur in any product produced.

It has been estimated that in 1963 there were more than 50,000 products liability cases of all types occurring per year (10, p.5). This is an increase from just handfuls of cases per year 15 or 20 years ago. The significant increase in the number of cases is largely the result of (1) greater public awareness of potential liability situations, (2) publicity given by news media to substantial awards given, (3) articles and books such as Ralph Nader's "Unsafe at
Any Speed (38), and (4) more liberal court imposed standards for finding liability. All indications point toward a continued trend in this direction and estimates have been made that within a few years that products liability suits will outnumber automobile liability cases (35). Not only is the number of suits increasing but the size of the awards is also. In Cook County, Illinois in 1960 the average award was $1400 in three cases and in 1967 it had climbed to $33,000 in seven cases (13). The nationwide average is now around $25,000.

The liability of a manufacturer or seller may result not only from defects in the product itself but from defects in the manufacturing process, representations made by salesmen or advertising, defects in the testing procedure outlined in the instruction manuals, unsafe practices shown in the instruction manual or in advertisements, inadequate warnings of hazardous situations, failure to submit the product to independent testing laboratories for approval, and many others. In order to avoid products liability suits in the light of all of these obligations requires a good deal of foresight and care mixed with more than a small amount of luck.

To add to the burden, the manufacturer of electronics equipment is liable not only for defects which he introduces into the product but also for any defects which are present in resistors, capacitors, transistors, and any other components supplied him for use in the product. Of course in such a case, if the manufacturer loses a products liability action as a result of a defect present in one of the
components placed in his instrument he can recover his loss from the manufacturer or seller of the component. This however, only results in an additional products liability action.

The situation though complex is not hopelessly complex. Further discussion of products liability theories and steps that the manufacturer can take to avoid liability are discussed in the following sections.
II. PRODUCTS LIABILITY THEORIES

2.1 Actions Based on Negligence.

Products liability actions have occurred in some forms for hundreds of years but at a nearly insignificant level. One of the earliest forms of such actions involved negligence by the manufacturer or seller with respect to a product. In earlier times legal liability in such cases would be recognized in the law of negligence, and it is only within the last 20 or 30 years that products liability became recognized as a separate but related area of the law.

The law imposes many obligations on individuals in dealing with others. Among these obligations is the duty to use reasonable care to avoid injuring another or his property. A failure to adhere to this duty of due care is negligence and for negligent acts the victim of the negligence is entitled to legal redress against the negligent wrongdoers, usually in the form of a money damages award. The standard is sometimes expressed as requiring that a person act as a reasonably prudent person in the same situation would act. Negligence is also described as "conduct which involves an unreasonably great risk of causing damage." (56, p. 148).

These definitions of negligence apply to the legal area of negligence generally, but discussion of negligence outside of the realm of products liability is outside of the scope of this thesis.
In the electronics industry negligence with respect to a product results when the manufacturer of an electronic instrument negligently produces it or sells it and as a consequence the buyer or user of the instrument is injured or his property is damaged. The negligence can occur during design, production, shipping, or a subsequent call by the field engineer. Negligence merely requires that someone in the company fails to exercise due care with respect to the instrument. The injured party can recover from the manufacturer or the seller for injuries resulting from the defective product.

Negligence involving the product results not only from direct negligence by the manufacturer himself but also from negligent acts committed by his employees or agents. Negligence committed by others and attributable to the manufacturer under an employer-employee or principal-agent relationship places liability on the manufacturer under the legal doctrine that one who has control of another's acts is responsible for them. Acts of employees or agents are attributable to the principal when, (1) within the authority of the agent or employee and (2) in furtherance of the principal's business. A corporate defendant, not being a person, is obviously incapable of any direct negligence and any negligence attributed to it results from either the employer-employee or principal-agent relationship.

Of the various theories available for imposing liability on the manufacturer of a product, negligence is probably the one used with the greatest frequency. The essential elements for finding liability
under negligence is that (1) the manufacturer is legally negligent; (2) as a result of the negligence a defective product is produced; and (3) that the user is injured or his property is damaged as a result of the defect.

The early English case of Winterbottom vs. Wright (71) in 1842 was one of the first to declare product liability on the basis of negligence. In that case a coachman driving a stagecoach was thrown to the ground and lamed for life due to a defect in the coach resulting from negligence of the defendant. The plaintiff's action for damages was not permitted, however, because of a failure of privity of contract, discussed in Section 2.5.

Many imaginative plaintiffs have attempted to prove all manner of negligent actions against defendants, some of which are based almost on wishful thinking. Illustrative of this is the case of Schemel vs. General Motors Corporation (61) in 1966, where suit was brought against General Motors for negligence in designing a car capable of being driven 115 miles per hour. The plaintiff in the case hoped to recover from General Motors for injuries suffered when struck from the rear by a Chevrolet Impala allegedly driven at that speed. The plaintiff was unsuccessful in proving negligence on General Motor's part and General Motors won.

2.2 Actions Based on Breach of Warranty.

Another legal theory which has resulted in products liability cases over a considerable period of time is that of breach of war-
A warranty is a legally binding promise made by seller to buyer relating to the safety or quality of a product. In a sense the seller acts as a guarantor that the product is as warranted. Often there are both express warranties and implied warranties.

Warranties can arise expressly by actual agreement between the buyer and seller, or impliedly because of the very nature of the product as in the case of warranties that the product is suitable for the usual uses to which the product is intended and that the product is fit for a special purpose. In either case, the seller is liable for breach of warranty if the product does not perform as warranted. In the electronics industry express warranty terms are often included in the instruction manual for an instrument which the buyer probably will not see until he already has purchased and received the instrument. To say that these terms form part of the basis of sale of the instrument where the buyer is unaware of them until after the sale is obviously a fiction and these terms are often ineffective.

The first products liability action for breach of warranty seems to have occurred in the English case of Stuart vs. Wilkins in 1778 (66). From that early beginning manufacturers and sellers of products have been held frequently liable for breaches of warranty.

Breach of warranty need involve no negligence in the usual sense on the part of either the manufacturer or seller. The only requirement is that some sort of warranty exist as to the safety or quality of the goods and that the warranty be breached by the product not
being as warranted. A warranty can be created in numerous ways some of which are discussed below.

Adoption of the Uniform Commercial Code (4, p. 1) in 49 of the 50 states has affected liability under breach of warranty because of the implied warranties resulting from the code. In Section 2-314 (43) of the code an implied warranty of merchantability results at least with respect to the following:

"(2) Goods to be merchantable must be at least such as:

(c) are fit for the ordinary purposes for which such goods are used; and

(e) are adequately contained, packaged, and labeled as the agreement may require; and

(f) conform to the promises or affirmations of fact made on the container or label if any."

In addition to the warranties created by Section 2-314, Section 2-315 (44) creates an implied warranty of fitness for a special purpose when the buyer is relying on the seller's skill or judgment in selecting suitable goods.

These two sections result in the warranties occurring in spite of no actual intention that they occur if the proper combination of circumstances is present between the buyer and the seller. The effect of warranties can be limited somewhat by express agreement between buyer and seller. Under the provisions of Section 2-302 (41) however, limitations on the warranties of Sections 2-314 and 2-315 must not be "unconscionable", that is extremely one-sided in their
effect or the express modifications will not be enforced.

A common situation in the electronics industry produces a warranty of fitness for a special purpose. That situation arises when a customer wants to buy a piece of electronics equipment such as a counter, digital voltmeter, or oscilloscope and calls the local field engineer or representative. He outlines his requirements and the field engineer or representative recommends an instrument for the customer's purposes which the customer buys. If the instrument is not satisfactory for the special purpose, the seller is liable for breach of the warranty of fitness for a special purpose and depending on the relationship between the seller and the manufacturer, the manufacturer may also be liable.

An independent seller is not liable on manufacturer's warranties which he does not expressly or impliedly adopt as his own. Similarly, a manufacturer is not liable for seller's warranties which he does not adopt as his own.

2.3 Actions Based on Fraud or Negligent Misrepresentation.

To a much lesser degree than negligence or warranty, other theories have been used to impose products liability. Among these are actions based on fraud and those based on negligent misrepresentation. These two actions are closely akin.

Fraud is a theory which has been used to permit buyers to recover from sellers in numerous instances where the seller has misrepresented
the products sold. Fraud is strictly speaking an intentional misrepresentation of the nature of the goods but the law in some jurisdictions treats negligent misrepresentation of the goods as a sort of constructive fraud since it has the same effect on the buyer. Other jurisdictions treat negligent misrepresentation as negligence. The seller can be held liable under either constructive or actual fraud.

In order for fraud to be actionable, certain elements must be present. These elements are: (1) the representation must be made as a statement of fact; (2) the statement must be untrue and known to be untrue by the person making it, or else was recklessly made; (3) the representation must be made with the intent to deceive and for the purpose of inducing the other party to rely upon it; (4) the other party must have in fact relied upon it; and (5) thereby the party was induced to act to his injury or damage (56, p. 700).

The theory of fraud has been used to hold the seller liable under many instances where the buyer was induced to buy due to the representations of the seller. In other words if the misrepresentations were considered to play a major role in the decision of the buyer to buy, and he was damaged thereby this forms the basis for an actionable fraud.

Fraud can be seen as closely related to warranty. In warranty the seller warrants that a product is safe or properly made and is thereby held to stand behind the warranty as made. Negligence need not play a part in the warranty action. Fraud involves the represen-
tation of something as fact which is not and which becomes part of
the basis of the sale. The representation may in some cases be a
warranty as well. The misrepresentation may be either deliberate or
negligent. The major distinction between warranty and misrepresenta-
tion is in the recovery permitted and in the time from an injury or
damage in which a suit can be brought before being barred by the
statute of limitations.

The case of Baxter vs. Ford Motor Company (2) in 1932 illustrates
a case of fraud. In that case the court held that catalogues and
other printed matter describing the windshields in Ford cars as being
shatterproof constituted fraud. The plaintiff suffered a loss of sight
when the allegedly shatterproof windshield was hit by a rock and shat-
tered. He was permitted to collect damages for the injuries received.

2.4 Action Based on Strict Liability.

Strict liability is a legal theory which imposes legal liability
without negligence or fault. It is an outgrowth of warranty in prod-
ucts liability cases and is justified on the basis that a manufacturer
who puts a dangerous product on the market should be held liable for
any injuries or damage which results. Liability occurs in spite of
a showing that no degree of care would have resulted in elimination
of the hazard.

Strict liability only requires that a product be dangerous under
a condition of normal usage and that someone is injured or his proper-
ty damaged as a result of the dangerous nature. Of course, for a
defendant to be held liable under strict liability, the defect in
the product must have been present when it left the control of the
defendant. A manufacturer won't be held liable for a defect which is
introduced or occurs after the product leaves his control.

The theory of strict liability was first adopted in the English
case of Fletcher vs. Rylands (15) in 1865. In that case the court
held that a reservoir that the defendant had built on his property
was an abnormally dangerous condition and activity for which there was
strict liability without regard to fault when the reservoir collapsed
into some abandoned mine shafts and flooded the mines of the plaintiff.

The theory of strict liability was expanded into the field of
products liability first in the area of food products and beverages
because of the abnormally high risk of injury to persons resulting
from defects in this area. From this a continual expansion of the
strict liability theory has taken place in more and more situations
where the risk of injury resulting from a defect is great (54, 55).
Strict liability appears clearly to be applicable to the electronics
industry because of the high degree of probability that someone may
be injured by a defective electronics product.

Strict liability is now an accepted theory in most of the
jurisdictions of the United States but this development has come in
the last decade with regards to products liability. The adoption of
strict liability by most jurisdictions has been one of the major de-
velopments in the field of products liability and is one factor
responsible for the recent large increase in products liability cases.

The 1963 California case of Greenman vs. Yuba Power Products, Inc. (22) held that strict liability was applicable in cases involving liability for injuries caused by defective industrial products. In that case the plaintiff was injured when a piece of material that he was working on in a lathe flew out because of defective clamps and struck him causing injuries. The Greenman case has been followed in many other jurisdictions to apply strict liability to industrial and consumer products and indications are that it will be adopted in virtually all jurisdictions. Strict liability was adopted in Oregon in 1965 in the case of Wights vs. Staff Jennings (70) involving a power boat explosion.

The Greenman standard of strict liability applies when a manufacturer places a product on the market, knowing that it will be used without inspection for defects, and which has a defect that causes injury to a human being. Strict liability has since been expanded to cover property damage and in some cases to mere financial losses (55).

The doctrine of strict product liability has received considerable support from the Restatement of the Law of Torts, Section 402A (59). In that section, strict liability for defective products is expressly endorsed both as to personal injuries and physical damage to property.
2.5 Requirement of Contractual Relationship.

Products liability under all of the theories thus far discussed has been until about 1916 greatly restricted by the requirement that there be some contractual relationship between plaintiff and defendant. This requirement of a contractual relationship (privity of contract) is discussed in the following illustration:

Mr. Jones goes to the local radio shop and purchases a table radio for his home. He then takes it home and plugs it in for use. Mrs. Jones in the process of tuning the radio comes in contact with a defective power cord\(^1\) on the radio and is severely injured requiring a considerable period of recovery in a hospital. Because Mrs. Jones did not purchase the radio she has no contractual relationship with the seller and thus no privity of contract. Under the old theories, Mrs. Jones could not bring an action for her injuries against the seller because of the absence of privity of contract in spite of the fact it was the seller's defective product which caused her injuries. Had Mr. Jones been injured in the same way, he could have sued the seller because he had the necessary privity, but he couldn't have sued the manufacturer of the radio because he had no privity of contract with him.

\(^1\) For a personal injury case involving a defective power cord see White Sewing Machine Co. v. Feisel (69).
Because of the obvious unfairness of the situation many courts began to use elaborate fictions to circumvent the requirement of privity such as "vicarious privity" and agency and to develop exceptions to the rule. The number of exceptions to the rule in some of the jurisdictions is now so great that the requirement of privity in these jurisdictions can be said to no longer exist. Other courts have recognized this and categorically eliminated the requirement of privity. Some jurisdictions still require privity in certain instances and it is therefore not a completely dead rule although obviously on its way out (32).

One of the landmark cases involving rejection of the requirement of privity was the case of MacPherson vs. Buick (34) in 1916. In that case, the plaintiff was injured when one of the wheels of a new Buick collapsed shortly after it was purchased. The plaintiff sued the manufacturer of the car, Buick, for the injuries even though the car had been purchased from a dealer and there was, therefore, no privity of contract between the plaintiff and Buick. The court rejected the requirement of privity and permitted the plaintiff to recover for his injuries.

Section 2-318 (45) of the Uniform Commercial Code expressly extends protection of warranties to others in the buyer's household and thereby further breaks down the requirement of privity of contract.

Elimination of the requirement of privity of contract in most jurisdictions, at least as to certain types of cases, has obviously
produced more potential plaintiffs in products liability cases and is another major factor in the increase in the number of such cases. The last vestiges of the requirement of privity only requires that in order for an action to be brought the person injured might have been reasonably foreseen by the seller or manufacturer. This has grown to include innocent bystanders as illustrated by the case of Mitchell vs. Miller (37) in 1965 where a person playing golf was run over by a runaway automobile whose transmission failed to lock in the park position. He was permitted to recover from the automobile manufacturer for his injuries.
III. ELEMENTS OF A PRODUCTS LIABILITY CASE

3.1 Defectiveness or Harmfulness of Product.

All of the legal theories in products liability require that there be some defect in the product. The defect causing harm, however, need not be contained in the product inherently but may be imputed to the product because of collateral circumstances. A defect is held to be contained in the product when use of the product in the manner which is intended or reasonably foreseeable results in injury, under the strict liability theory. That is, a product can only produce liability if when used in the normal manner for which the product is intended, it causes harm.

To illustrate, consider an oscilloscope. The oscilloscope is intended to be used as a means for observing electrical waveforms and voltages. If in the course of using it for that purpose or in maintaining it, injuries result, liability can attach to the seller or manufacturer. If on the other hand the oscilloscope is used as a step to climb on something and the cover collapses causing a fall and resulting injuries no liability will attach because the oscilloscope was not used in the manner normal for oscilloscopes.

By instruction manual or advertisements, what is considered normal for use of a product can be changed and the manufacturer or seller can be held liable for the new uses. For example, an oscilloscope manufacturer may run an advertisement of an oscilloscope used
in an application that requires that it be run floating on a high voltage. This might result in floated operation on high voltage supplies to be considered normal operation and the manufacturer could be held responsible for damage resulting to the oscilloscope from operating it in this manner and also, perhaps, for personal injuries resulting from this hazardous operation.

The defect or hazard in the product must be one which the user doesn't discover in order for liability to occur. A knife is an inherently dangerous device because of its sharp edge and sharp point. When a user of the knife cuts himself while using it, he can't hold the seller or manufacturer of the knife liable because the hazard is obvious. The product must not be unreasonably dangerous for the uses intended, meaning that if there is a reasonably easy means available at the time that the product is produced to make it less hazardous, liability might be established against the manufacturer on the basis of negligence in not making the improvement.

Defects in the product can only be determined from the total circumstances surrounding the product. To be considered are the type of use, the seriousness of harm if a defect occurs, the ease with which improvements could be made, known hazards and types of warnings, representations and warranties made in printed matter associated with the product, and representation and warranties made by the sales agent or representative.
Liability can, of course, be found for negligence not involving the product and consequent freedom from defect of the product, but this sort of situation is strictly speaking not products liability. Products liability requires some defect in the product.

Hazards in the electronics industry which should be guarded against to avoid product defects include voltage hazards, radiation, and dangerous components. The mechanical package of an instrument must be designed to minimize chances of physical injuries. Even the shipping carton for the instrument needs to be designed with safety in mind.

3.2 Manufacturer or Seller of Product as Defendant.

In spite of a defect in the product which could result in liability, no liability can be found for a manufacturer or seller not connected with the defect. This means that unless there is proof that the defendant either sold or manufactured the product, or was liable on some other theory, he can't be held liable for the defects in it. In addition, a defect introduced into a product after it leaves the control of the manufacturer does not produce liability for the manufacturer. For example, the manufacturer or original seller of a television set is not liable for a defective cathode ray tube, installed by an independent service agency, which implodes causing personal injuries or property damage.
This appears to be an obvious result of the law, but is an area which is still occasionally litigated. It appears patently reasonable that one should only be held liable for his own actions and not those of others totally unrelated. A manufacturer can be held liable for defects in products not made by him but which carry his label as in Smith v. Regina Manufacturing Company (65) in 1968. The Sears Roebuck and Company was held liable for $85,000 for back injuries received by the plaintiff resulting from electrical shock from a defective floor polisher made by Regina Manufacturing Company but carrying the Sears Kenmore label. One interesting case in this area was Shachoy vs. Chevrolet Motor Company (64) in 1932 when an action against Chevrolet failed because of inadequate proof that Chevrolet Motor Company was manufacturer of the 1927 Chevrolet sedan involved in the case. Cases don't usually fail on these grounds however.

Manufacturers can also be held liable for defects in their products resulting from defective components supplied by others as illustrated by MacPherson v. Buick (34) discussed earlier. The wheel which collapsed causing the injuries was supplied by an independent company. Buick was held liable anyway.

3.3 Defects as the Cause of Damage.

It is not sufficient to produce liability that there be a defect in a product or that there be negligence by the manufacturer or seller and the plaintiff is injured. The injuries or damage sustained by the plaintiff must be the direct result of the defect or negligence. That
is the defect or negligence must be the proximate cause of the injury or damage and that fact must be established by proof. A defect in a product or a potentially hazardous situation will not ordinarily be considered the proximate cause of the injury when the defect or hazard was observed and noted by the plaintiff and in spite of it he continued to use the product.

The manufacturer of a television with frayed wires will probably not be held liable for a fire resulting from a short after the user of the product has observed the fraying and realized the danger. In such a situation it is generally considered that the negligence of the user is the proximate cause of the damage or injury and the negligence of the user has become an intervening superseding cause of the end result.

3.4 Negligence.

Negligence is one of the usual elements of a products liability action since in most cases, a defect in a product probably results from someone's failure to exercise due care. In order for there to be a case against the defendant manufacturer or seller, the negligence must be attributable to him.

Negligence may be alleged in the design, component selection, manufacture, shipment, sales, advertising, instruction manual or in some combination of them. The manufacturer is responsible for any negligent act committed by an employee or agent and in some cases by a supplier.
3.5 Breach of Warranty.

Often a products liability case will also contain allegations by the plaintiff that the defendant made warranties with respect to the product which were breached. The breach may be of express warranties resulting from the dealings between the parties or the implied warranties resulting from the Uniform Commercial Code and advertisements and other forms of communications and prior dealings.

In the typical electronics situation, the warranties created are numerous. In addition to the warranties of the Uniform Commercial Code, virtually every representation made concerning the product upon which the purchaser relies, becomes a warranty. This includes published specifications and representations made by the defendant concerning performance or safety either directly or through agents.

A distinction must be made, however, between representations which create a warranty and advertising talk, not seriously made nor relied upon: so-called sales "puffing" or "sales talk". If a statement is made which is obviously frivolous or so indefinite that no objective standard will permit measurement, the statement will be considered sales "puffing" and no warranty will be created. A statement by a representative for a digital voltmeter manufacturer that a certain digital voltmeter is the "best made anywhere" will probably be considered "puffing" and not create a warranty. On the other hand, a representation that it has one millivolt resolution will usually create a warranty.
Warranties can also be created by samples supplied to a potential buyer under the provisions of Section 2-313(c) (42) of the Uniform Commercial Code. That section reads as follows:

"(c) Any sample or model which is made part of the basis of the bargain creates an express warranty that the whole of the goods shall conform to the sample or model."

This provision would have a much more serious effect on the electronics industry than it has if it weren't for the fact that components and other devices are usually sold by specification rather than by sample. The semiconductor supplier would have a serious plight if it should be held that samples of a transistor supplied create a warranty that all others of the type would be just like the sample.

3.6 Strict Liability.

Strict liability will be alleged whenever possible because proof of negligence by the defendant is not required. It is frequently a difficult task to prove that negligence by the manufacturer or seller occurred and that such negligence was the cause of the injuries or damages.

Also it is not required that it be shown that the defendant manufacturer or seller introduced the defect, only that it existed when it left the control of the defendant. The defect may have been present in a component supplied by another and merely used in the end product as discussed previously. The manufacturer or seller of the
the end product is still liable.

It is often not an easy task to establish that the defect was present when it left the defendant's control. A defect could have been introduced sometime later, as for example by a trucking company transporting it. Without proof that the defect occurred while in the defendant's control the action against him fails.

Manufacturers are not indefinite insurers of products and there is no obligation to produce a product which never wears out. A hazard which finally results due to normal wear is not considered a defect attributable to the manufacturer and he is therefore not held liable for it. A drive chain in a heavy machine, for example, which breaks due to normal wear does not result in liability to the manufacturer.

3.7 Choice of Theory.

The choice of the theory used under a products liability situation is frequently very important. The various theories have different standards of proof and frequently have different measures of recovery. Time in which to sue under the various statutes of limitation is also an important consideration since an action may be barred due to the running of the applicable statute of limitations under one theory but remain available under some other theory. Obviously the plaintiff in an action will use the theory which he can prove and which will maximize the recovery against the defendant. As a practi-
cal matter, the plaintiff will allege all theories in hopes that he can prove at least one.

The principle of alleging all possible theories of products liability has its corollary in the policy of suing everyone connected with the product. Under this system, the action is brought against all possible defendants to insure that recovery can be obtained from someone.
IV. DUTY OF CARE OF MANUFACTURER OR SELLER OF PRODUCT

4.1 With Respect to Potential Harm.

Generally speaking, the greater the potential harm which could result from a defect the stricter the requirement of care becomes. If there is a hazard which could result in serious injury or property damage and the manufacturer is aware of it, the courts will impose a duty to warn of the hazard. Also, if the risk of harm is great, the courts are much more likely to impose strict liability on the product.

In the electronics industry there are many risks which are great and hazards are present in electronics equipment by its very nature. Among the hazards present are: risks of shock or electrocution (25, 65, 69), risk of fire (24, 39), risk of explosion, radiation, burns and many others. An important consideration is the fact that electronics equipment is used in many critical situations where just failure of the equipment itself could have a very serious result. As an example of this, consider the extensive use of electronics instruments for navigational purposes on commercial aircraft. If such an instrument fails due to a defect in the product a crash can result and many people may be killed. \(^2\) If the cause of the crash can be traced to a particular manufacturer's electronics equipment, he could

\(^2\) In the case of Goldsmith v. Martin Marietta Corp. (21) in 1962 the cause of an airplane crash was alleged to be a defect in a flux-gate compass system aboard the aircraft in a suit resulting from the death of a crew member.
be held liable for the damage resulting. Strict liability would most likely be imposed in that situation.

Tantalum oxide capacitors wired in backwards can explode causing serious eye injuries. Radiation from a television set can cause x-ray damage. Overdissipated resistors can burn or cause burns. Improper fusing can cause the instrument to catch fire and burn. A technician can follow an unsafe procedure outlined in an instruction manual and be electrocuted. The list goes on and on.

In each of the situations, an unreasonable hazard existing in the product and the chance that it can cause serious harm will result in the hazard being considered a defect. Obviously the more serious the potential harm which could result, the more likely it is that the hazard will be considered to be an unreasonable one. The manufacturer, wholesaler, retailer, or component manufacturer, wholesaler or retailer could each be held liable for the damage resulting from the defect in a proper situation.

The damage resulting from the defect need not be physical damage. The damage may be mere financial or pecuniary damage causing serious financial loss to the user. As an example of this situation, consider a transistor manufacturer who uses a test system supplied by an electronics instrument manufacturer on each of his production lines. If because of a serious and hazardous defect in the test system, all of the systems have to be removed for modification, this could and probably would shut down all of the production lines. The financial loss
to the semiconductor manufacturer would be serious and under the right circumstances the system manufacturer could be held ultimately liable for the loss.

4.2 With Respect to the Intended User.

The legal obligation of care depends a great deal on the anticipated user of the product. More explicit warnings and greater care would be required for a product intended for use by a housewife than that required on a product intended for use by a skilled technician.

It is fortunate that much of the equipment in the electronics industry is intended for use by technicians since if the same products were intended for use by housewives many of the current practices would be considered defects. A technician working on a piece of electronics equipment knows that there are often dangerous and perhaps lethal voltages contained in the equipment. Therefore in equipment intended for a technician's use, only unusual voltage hazards need warnings. If in doubt, however, it is better to err on the side of too many warnings.

A television set intended for use by the average housewife must contain interlocks and have prominent express warnings of the dangerous voltages and other dangers contained in the set. Without these warnings and interlocks, the product would likely be considered defective and liability would result. Emphasis must be made on the point that what is considered unreasonably dangerous and a defect depends largely on what additional steps could have been taken to make the
product better.

What is considered an unreasonable hazard changes from time to time as conditions change. Technicians have been accustomed to working with electronics equipment containing tubes. As a result, they have been used to the relatively high voltages contained in the instruments and it has not been considered necessary to warn against such voltages appearing in the equipment. Equipment now using transistors and integrated circuits is changing all of that, however, because of the low voltages used in association with these devices. As a result, it may become necessary in the future to warn against voltages comparable to those formerly associated with tubes when they are used in an instrument.

4.3 Design.

The obligations of care begin with the design of the product. A defectively designed instrument which gets into the marketplace is more likely to result in a products liability suit than occasional manufacturing defects if only from the number of defective instruments involved. Proper design requires that reliable components are used and that they are used as intended, within their ratings, and according to their specifications. Reasonable care is also required in circuit design.

Mechanical design of the product is extremely important. Sharp corners which can cause injury should be eliminated and the structure of the instrument should be such that it is unlikely to break during
normal usage and cause injury. Covers should be placed where possible over hazardous areas of an instrument.

Interlocks and protective covers may be required for work stations or equipment used by relatively unskilled or even skilled workers. An instrument capable of producing dangerous voltages at a front panel connector such as, for example, a high voltage pulse generator must have appropriate warnings and if it is feasible to go farther than warnings to eliminate the hazard, this should be done.

4.4 Component Selection and Testing.

The courts have imposed an obligation on manufacturers of equipment with respect to the components used in the equipment. Under the strict liability theory, the manufacturer who uses a defective part is liable for any damage resulting. It is obvious that it is essential that parts used in electronics instruments be examined and tested to find any defects which might exist in them where a defect is likely to cause substantial harm as is the case with cathode ray tubes, capacitors, transformers and many other parts.

The court imposed requirements with respect to testing would also seem to apply to insuring that components meet published specifications since they would be considered defective if they did not. Complete testing of components is particularly required where the end product instrument is to be used in critical applications, as for example, aircraft navigation equipment, spacecraft, and medical
electronics.\(^2\) In jurisdictions not recognizing strict liability, liability might still be found for defective components on the basis of negligence. Negligence might result merely from the failure to exercise due care in the inspection and testing of the components.

4.5 Inspection and Testing.

In the same way that a manufacturer is obligated to inspect and test components used in his product, he is obligated to test his own end product for defects. The inspection must be such that it is reasonable in light of the risks involved. This again depends on the application of the end product.

In the electronics industry one of the obvious requirements of testing is to insure that the product complies with all applicable electrical code requirements and industry standards. Failure to submit a product to an independent laboratory such as Underwriter's Laboratories for testing may be held to be negligence and may result in liability attaching to the manufacturer.

Approval of a product by Underwriter's Laboratories or other independent testing facilities does not free the manufacturer from liability for product defects and too great a reliance on such tests must not be made (14). Approval merely is evidence that reasonable

\(^2\)For an article discussing the hazards and complications associated with medical electronics see "Would you put that probe on your sick grandmother?" (14).
care was used to assure that no defects are present. A defect in a product which is approved by an independent test facility may permit the injured plaintiff to recover from the test facility for their negligence in approving the defective product (8).

4.6 Duty to Warn of Potential Hazard.

The manufacturer or seller of a product has an obligation to warn of dangers in the product of which he is aware or should be aware. This obligation does not extend however to hazards which are obvious such as warning that a knife blade may cut. The requirement appears to serve as a means to insure that dangers known to the manufacturer or seller and not apparent to the user are pointed out to him.

The most usual hazards encountered in electronics equipment are those involving unusual voltage situations, input and output ratings, hot areas or components, and components which are hazardous to handle. All of these hazards should be pointed out by appropriate warnings.

To be effective, the warning must be prominent and explicit. It must be in a conspicuous place and not only give the warning but also the probable consequences of failure to observe the warning if it is not obvious. Warnings have been held to affect the warranty given on the product and defects under strict liability situations. Failure to give adequate warning has been held to be negligence. Liability for a failure to warn may therefore result on several legal theories.
Warnings should also be given where there is danger of connecting loads or inputs to an instrument which are beyond the capabilities of the instrument. Failure to warn that the instrument may be damaged can result in liability for the damage resulting.

4.7 Advertisements.

The most significant area of duty with respect to advertisements is in the area of warranty. Representations made in advertisements are frequently considered to be warranties and the manufacturer or seller is held liable on the warranty. An advertisement showing the use of a product in a dangerous manner where the danger is not obvious can be used to cause liability to the manufacturer or seller when the user uses the product as shown in the advertisement and is injured. Advertisements must be screened to insure that they portray no unsafe practices and also to prevent an inadvertent extension of the product's warranties.

4.8 Instruction Manuals.

A particular duty of care is imposed upon the manufacturer or seller with respect to the instruction manual on a product because of the large amount of information regarding the instrument contained in the manual. Manuals in common with advertisements can be used to extend warranties to the user. Unlike advertisements, however, instruction manuals specifically spell out procedures to be used in normal application and maintenance of the equipment. A faulty procedure
resulting in personal injuries or equipment damage can result in liability to the manufacturer or seller.

Appropriate warnings must be placed in the instruction manual at critical points to warn of hazards to be encountered in use or maintenance of the equipment. A failure to warn or a defective warning or procedure may be held to be negligence. Since schematic diagrams are frequently used for maintenance and repairs, they should also contain warnings at appropriate places.

4.9 Service Aids.

Supplementary information on servicing put out by the manufacturer carries much the same burden as manuals. This type of publication includes maintenance information, service hints, and field modification sheets. Many companies publish this sort of information as an aid to the owners of their products and the information contained in these publications should be treated with the same care as is given to the instruction manuals.

4.10 Test Procedures.

Supplementary test and calibration procedures can also impose liability on the manufacturer if unsafe practices are outlined and relied upon. It seems clear that the courts would require that these procedures be carefully checked out and tested for hazards in order to satisfy the standard of due care.
All publications can be treated as products for liability considerations. They can also be used to impute defects to the equipment that they are associated with.
V. DEFENSES TO PRODUCTS LIABILITY

5.1 Avoidance of Defect.

The most obvious way to avoid a products liability case is to use extreme care that there are no defects in the products, no negligence with respect to the products and to insure that all warranties are complied with (1). It is only because of the obvious impossibility of this requirement that any further discussion in this area is necessary. A serious attempt to meet this goal will minimize the risk however. This is an obvious case where an ounce of prevention is worth a pound of cure.

5.2 No Defect or Damage.

If the user of a product is injured, in order to collect from the manufacturer it will be necessary for him to show that it was the manufacturer's negligence or a product defect which produced the injury. If the plaintiff is unable to prove that a defect in the product was present, his case on a strict liability theory will fail. The manufacturer can defend on the basis that no defect existed.

If the defendant manufacturer can prove that no damage was done to the plaintiff, again no liability will result to the manufacturer. It is an unusual case, however, where the plaintiff will go to court unless he has sustained some damage.
5.3 Defect Not Attributable to the Defendant.

Unless the plaintiff is able to establish by evidence that a product defect is attributable to the defendant, his case will fail. Anything which the defendant produces as evidence of due care and reasonableness makes it more difficult for the plaintiff to sustain this burden of proof.

If a suit is based on a negligence theory, good records are an essential part of the defense. The records can be used as evidence that all reasonable care was used in the design and manufacture of the product. These records should include design goals and considerations, decisions made with respect to safety features and other safety alternatives considered and why they were rejected, results of tests made on the product both in the design stage and manufacturing stage, tests made by independent laboratories and test and calibration reports. These records can provide very persuasive evidence that every reasonable precaution was taken in the production of the instrument.

5.4 Defect Not Cause of Damage.

In order to hold the defendant liable, the plaintiff must prove that the defect in the product was the actual and proximate cause of his injury. If the defendant can establish that the injury was caused by other than such a defect, he can avoid liability for the damage.
5.5 Contributory Negligence or Assumption of Risk.

It frequently happens that the user of a piece of electronic equipment recognizes that there is some hazard or risk associated with the use of it, but he continues to use it anyway. He may, for example, recognize that some dangerous voltages are present on the front panel but continue usage until he finally comes in contact with the voltage and is injured. He may then sue the manufacturer for the injuries which he suffered as a result of the defect in the product.

In such a case the user will not be able to collect if the manufacturer can establish that the continued usage of the instrument in light of its known hazards was negligence on the part of the user and that such negligence contributed to the injury. It might also be held that having recognized the hazard, the user assumed the risk of injury by his continued usage, and he therefore cannot hold the manufacturer liable. On either theory no liability results.

The effectiveness of the defenses of contributory negligence and assumption of risk depend somewhat on the theory of liability involved. Under strict liability it is sometimes held that contributory negligence is not a defense, particularly when the contributing negligence was merely in not detecting the hazard present.

5.6 Disclaimer.

Disclaimers are frequently used in an attempt to avoid products liability. A disclaimer is a limitation on the extent of warranties given and is often disguised as the express warranty on the product.
Although this type of disclaimer is ostensibly a warranty, it is really an attempt to disclaim warranty. Disclaimers are commonly used in all fields of manufacturing including electronics, but are perhaps most notable and consistently present in the automotive industry. Warranties on automobiles are invariably disclaimers.

If the manufacturer can establish that a disclaimer eliminates the warranty on which the plaintiff is attempting to sue, obviously the plaintiff is unable to collect. Disclaimers are notably ineffective in many cases, however, except in the area of dealings between the immediate buyer and seller. Some courts have eliminated the effects of disclaimers totally in the area of negligence and strict liability by declaring categorically that they are void and that it is opposed to public policy to permit a manufacturer or seller to avoid liability for his own negligence. Many such disclaimers do not result from real agreement between the parties and may come under the "unconscionable" provisions of Section 2-302 (41) of the Uniform Commercial Code to prevent their effectiveness. In these jurisdictions disclaimers are useful only to a limited extent and

4 A typical disclaimer of warranties is as follows (27, p.24):
"All Hewlett-Packard products are warranted against defects in materials and workmanship. This warranty applies for one year from the date of delivery, or, in the case of certain major components listed in the operating manual, for the specified period. We will repair or replace products which prove to be defective during the warranty period provided they are returned to Hewlett-Packard. No other warranty is expressed or implied. We are not liable for consequential damages."
serve mostly to discourage suits and not to defend them. It is obvious that a manufacturer or seller should not depend too heavily on disclaimers protecting them from liability.\textsuperscript{5}

5.7 Privity of Contract.

Privity of contract is still available in some jurisdictions of the United States as a defense. In these jurisdictions if the plaintiff is unable to establish the necessary contractual relationship or that his case falls under one of the numerous exceptions his suit will fail. The trend in the courts is clearly toward the elimination of privity of contract as a requirement to sue (50, 51) and it, like disclaimers, should not be counted on too heavily to provide a defense. Even in courts which presently require privity of contract, that requirement may be eliminated at any time.

\textsuperscript{5} In the case of Henningsen v. Bloomfield Motors, Incorporated (26) a standard automobile disclaimer was considered and rejected where the steering failed on a new automobile causing injuries to the plaintiff.
VI. DAMAGES

6.1 General.

One of the major areas of concern for an electronics manufacturer or seller is how much will the award in a products liability suit be if the plaintiff prevails. The answer to that in a general sense is that the award can be very high and can produce serious financial distress to a company. Damages are awarded for several different types of losses and the amount of the award depends somewhat on the theory of recovery. Many cases are settled out of court but also often involve very considerable sums of money.

As a general rule, the intent of the award in a negligence case is to place the plaintiff in as nearly as possible the condition that he would have been in had the negligence not occurred. Of course, it is not possible to compensate a person entirely by money for injuries which he may have received but an attempt is made.

In a contract case, based on warranty or fraud, an attempt is made to put the wronged party in the position he would have had, had the contract been fully performed and the product been as represented and warranted. Two general rules are followed with respect to damages. The first is the "out of pocket" rule which attempts to award in damages the difference between the value paid by the buyer and the value given by the seller. The second is the "benefit of the bargain" rule in which the compensation is measured by the difference between the
value of the products actually delivered and the value had they been as represented. There is a conflict as to which rule is to be used in the various jurisdictions and the issue seems not to be resolved. The trend seems however, to use whichever one produces the fairest results in each individual case.

Strict liability seems to have adopted the measure of damages applicable to the negligency theory of recovery. A distinction however appears to be in the area of a pure financial loss not associated with either personal injuries or property damages. Such financial losses are recoverable on a negligence theory but there is a conflict of decisions as to whether they are recoverable on a strict liability theory. The following sections discuss damages in greater particularity.

6.2 Personal Injuries.

In a successful products liability suit, the defendant is liable for damages resulting to the plaintiff for personal injuries which he received. This is the sort of thing that occurs when the user of a defective electronics instrument is injured by, for example, electric shock (25, 65). If the shock is severe it can cause hospitalization and perhaps permanent or long-lasting impairment of some capability of the plaintiff.

In such a case the defendant manufacturer can be held liable for impairment of future earning capacity, loss of earnings to the time
of trial, loss of profits or special opportunities to the time of trial, pain and mental suffering, cost of medical care and other expenses. For a very serious injury such as permanent and total paralysis the award for this portion of the damages can run into hundreds of thousands of dollars.

Death of the instrument user doesn't relieve the manufacturer from liability. Recovery in that case can be obtained by the personal representative of the deceased or by his relatives. Many states have a statutory limit on the amount of recovery permitted for a wrongful death, however, which at least limits the liability in such cases.

6.3 Property Damage.

The manufacturer of a defective electronic instrument will probably also be liable for any property damage resulting from the defect. For example, if a defect in a television set causes it to catch on fire and burn, causing as a result the owner's house to also burn, the manufacturer could be liable for the damage done to the house in addition to the damage done to the television set.

Property damage is measured by its value if destroyed. If damaged, the difference in value before and after the damage or the cost of repair is used.

6 This was exactly the situation involved in Newton v. Admiral Corp. (39) in 1967.
6.4 Loss of Use.

Where a defect or negligence results in the loss of use of any personal or real property, the defendant manufacturer can be held liable for the loss of use. This is usually measured in terms of the rental value of a replacement for the time that use is lost. In some cases where the property is totally destroyed the manufacturer can be held liable for the value of the property and also for the loss of use while the plaintiff attempts to find a replacement.

6.5 Pecuniary Loss.

A pecuniary loss is a financial loss suffered by the plaintiff as a result of a product defect or negligence. Under some circumstances the manufacturer or seller of the equipment may be liable for these losses (16, 63).

Consider the example of the electronics test system used on the transistor manufacturer's production lines discussed in Section 4.1. There a serious defect in the system required that all of the systems be removed to modify them resulting in all of the production lines being shut down and significant financial loss to the transistor manufacturer. The manufacturer of the electronics test system could be liable for all financial losses suffered by the transistor manufacturer including lost profits resulting from this shut down.

In the English case of Hadley V. Baxendale (23) in 1854, the court there set a limit on the recoveries which could be obtained at
least under a contract theory of recovery. The court there stated

(23, p. 151):

"Where two parties have made a contract which one of them has broken, the damages which the other party ought to receive in respect of such breach of contract should be such as may fairly and reasonably be considered either arising naturally, i.e., according to the usual course of things from such breach of contract itself, or such as may reasonably be supposed to have been in the contemplation of both parties at the time they made the contract, as the probable result of the breach of it."

Under the theory of Hadley vs. Baxendale, recovery can only be had for those consequences which could reasonably be contemplated by the defendant. In the electronics test system case above, if it was known to the seller that the test systems were to be used on the buyer's production lines, it probably would be held to be in the contemplation of the seller that the production lines could be shut down and that idled workers and loss of profits would result from a breach of warranty. Therefore the seller would be liable for these damages. The rule of contemplated damages described in Hadley vs. Baxendale is generally followed in the United States and is incorporated in Section 2-715 (46) of the Uniform Commercial Code.

The combination of personal injuries, property damage, loss of use, and pecuniary loss in a single products liability case occasionally does occur. When it does, the damages awarded to the plaintiff can approach or even exceed $1,000,000.00 (47).
VII. CONCLUSIONS

7.1 Future Developments.

The recent trend in products liability cases indicates likely future developments. With certainty the number of claims and the size of the awards will continue to increase. This will result largely because of continued publicity of products liability cases and consequent greater public awareness and as a result of continued liberal tendencies of courts for finding liability and awarding damages.

Strict liability appears certain to be adopted in more and more jurisdictions because of the risk of severe injuries which can result from defective products. Along with this is the virtual elimination of the requirements of privity of contract as a condition for bringing suit.

Increased statutory control of products also seems likely. This is showing up now in the governmental controls being placed on safety features in the automotive field. It seems reasonable to assume that these controls will be extended to other fields as well. One of the more likely fields of extension is in the area of consumer goods which will have an effect on consumer electronics. The National Commission on Product Safety, created in 1967 by Public Law 90-146, has express authority in this area. Non-compliance with statutory requirements will result in liability for injuries and damages resulting.
A further indication of government controls to come is the recent hearings on x-ray radiation from television sets and recall requirements in the automotive industry. Recall of defective products in other areas will occur under either voluntary control or mandatory statutory regulation (60).

An indication of public sentiment regarding defective products was given in a 1969 Time-Louis Harris Poll (6). In that poll, the response indicated that those polled considered a manufacturer of a defective automobile morally worse than a mugger by a very considerable margin of 68 percent to 22 percent.

7.2 Liability to Manufacturers and Sellers.

It is becoming more and more apparent that products liability should be an area of constant consideration in the design, development and production of electronic products. The risk of liability attaching to either the manufacturer or seller and the possible size of a damage award requires that a successful product line have this consideration. Products liability often is given insufficient attention. Many executives and engineers go to considerable extremes to cut the costs of products by a few cents and are completely oblivious of potential products liability situations which could put the company out of business.

Products liability has been instrumental in changing the principle of caveat emptor (let the buyer beware) to caveat vendor (let the
seller beware (35). The buyer receives more and more protection while the manufacturer and seller are held to higher and higher standards.

In the electronics industry there have been relatively few products liability suits involving industrial-type electronics equipment. Most suits have involved consumer electronics equipment. Two reasons seem most likely to account for this.

When a personal injury occurs and the person injured is an employee of a company, in almost all cases the employee is covered by Workman's Compensation. Therefore if the employee is injured on the job he doesn't need to sue the manufacturer of a defective product, he can recover under Workman's Compensation. This results in a low number of personal injury suits involving industrial electronics equipment.

Also in many cases where potential liability exists for an electronics company on products they have sold to another company the suit doesn't actually occur. Most companies in the electronics industry are reluctant to sue another for products liability because no one seems to want to get the products liability ball really rolling. A products liability suit is resorted to only after all attempts to reach some sort of out of court settlement of the problem area have failed.

There is no guarantee that the reluctance to sue in these two areas will continue. Should this reluctance be overcome, the courts
could become jammed with products liability actions.

7.3 Liability of Engineers and Employees.

Personal liability for product defects can attach to engineers (13, 62) and other employees of an electronics firm if their negligence causes the defect. The design engineer can be held personally liable for a defective design which causes injury and the standards for the size of the award are the same as for the company that he works for. Similarly a quality assurance inspector who negligently passes a defective product can be held liable as can innumerable others whose negligence causes damage or injury. Suits against engineers personally have been made possible by the elimination of the requirement of privity of contract which formerly would have barred most suits (32).

Fortunately for engineers and other employees of a firm, the plaintiff will seek a recovery from the company rather than the employees individually for the simple reason that usually the company has more money and a recovery is more likely. Even in the case where recovery is obtained from the company however, the engineer isn't entirely in the clear. Under some circumstances the company could then recover its loss from the negligent engineer or other employee although for obvious reasons this is rarely, if ever, done.

Instances where a plaintiff would proceed against an employee of the company rather than the company itself are rare. Where this
happens, it is usually because the company has gone bankrupt or for some other reason recovery from the company is impossible. The possibility of an engineer being sued personally should provide some extra incentive for doing the design job properly.

The legal obligations of products liability needs to be better understood by engineers. This and required knowledge of other legal matters has led Donald Gibson, Professor of Electrical Engineering at the University of Missouri, to conclude that electrical engineers should have some legal training, perhaps as part of the degree program (13). This appears to be a likely future step in engineering education.

Product liability suits often require the use of expert witnesses. In suits involving electronics equipment, the expert witness is most frequently an electronics engineer. At least one engineering firm has been formed, not to design products, but to provide independent labs and expert witnesses in products liability actions (49). Testimony in products liability cases may become an expanding role for engineers.

7.4 Moral Basis for Products Liability.

Products liability is justified on the basis that one who does a negligent act or who puts a dangerous product on the market should be liable for that act. Where one is injured as a result of the act, usually products liability passes the financial loss from the innocent
victim of the product, who probably is least likely to be able to absorb the loss, to the guilty manufacturer who can best afford the loss. There are obvious exceptions to this, however, and occasionally moral ends are not achieved.

Where an innocent party is injured as a result of another's malfeasance, it seems morally proper to permit the innocent party to recover at the expense of the guilty party. Proponents of product liability claim that the threat of claims forces manufacturers to build safer products. This is shown by the slogan "Sue for Safety" (10, p.6). It is obvious that there is strong public sentiment and demand for safer products and that fear of a suit may be much more effective in causing manufacturers to produce the safest possible products than mere conscience alone. Products liability, therefore, seems to produce several worthwhile results to justify its existence.

7.5 Business Considerations.

The threat of a possible products liability suit at any time should cause any reasonable manufacturer or seller of products to prepare for a possible suit. In the event of a successful suit, or a settlement out of court, the defendant must be prepared to pay the plaintiff, hopefully without putting the company into bankruptcy. Payment of the judgment can be made out of present cash, some sort of a contingency fund, or by means of products liability insurance. Of these choices, payment out of present cash seems the least satisfactory if the judgment is large.
A contingency fund can be set up if the company decides to be a self-insurer. In such a case the type of product and the risks of a possible suit and the size of a potential judgment should be considered in determining the size of the fund. If insurance is taken out, premiums will also be based on the type of product produced and the potential risk of a successful suit.

Insurance premiums will obviously be minimized if the company can show that it is conscious of the risk of products liability suits and is doing everything possible to minimize the risk. Some of the things which an insurance company will look at in setting rates besides the type of product and the history of suits in the field are: design goals and precautions, type of tests performed, specifications on quality control, review of label and manual copy, and records maintained (11, p. 25-26).

7.6 Preventive Measures.

Reasonable preventive measures are the best way for a company to avoid products liability problems. This means that the legal obligations of design, component selection, development, and production must be fulfilled. Careful records must also be kept showing that these obligations have been met.

Preventive measures may not completely eliminate the threat of a products liability suit. Perfect products are hard to achieve. However, if nothing else, these steps will permit the company to minimize
the insurance premiums to cover the suits which may result. The program may be summarized as "Design it Safe. Make it Safe. Keep it Safe" (1, p. 46).
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