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LIABILITY OF PRIVATE BUSINESSES AND INDUSTRIES FOR EARTHQUAKE HAZARDS AND LOSSES

*A Guide to the Law, Its Impacts
and Safety Implications*

September 1984

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ASSOCIATION OF BAY AREA GOVERNMENTS

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Background

In 1978-79, under a grant from the National Science Foundation, the Association of Bay Area Governments (ABAG) studied the potential liability of local governments for injuries and damage resulting from an earthquake. ABAG published two reports: "Legal References on Earthquake Hazards and Local Government Liability" and "Attorney's Guide to Earthquake Liability."

The reports noted the trend toward replacing the traditional common law rule of *sovereign immunity* for state and local governments from tort liability for governmental actions with statutory rules specifying areas of immunity and liability. A purely legal analysis leads to the conclusion that the tort exposure of local governments for a wide range of possible actions which may give rise to earthquake-related injuries and property damage is acceptably low if local governments take reasonable mitigation measures. However, ABAG's field studies of local governments in California and other western states indicate that the perception of local government officials of their potential liability has a significant impact on local government's willingness to act in certain situations. In fact, fear of liability may effectively deter them from acting to prevent or mitigate earthquake-related injuries and losses. Therefore, the study recommended a series of legislative steps designed to encourage local government to mitigate earthquake hazards by providing a measure of tort immunity or tactics for obviating such liability.

The California Seismic Safety Commission and several local governments and businesses in the state ex-

pressed interest in a parallel study on private tort liability. Based on ABAG's experience in public liability study, four areas of analysis were identified:

- legal theories of liability;
- private business and industry's perception of liability and its impact on private sector actions;
- the value of tort liability in promoting earthquake hazard mitigation; and
- recommendations based on the findings of the research.

The second study was also funded by the National Science Foundation. Findings are presented in the following five background reports, and this overall guide:

- "Private Sector Tort Liability: Safety Incentives, and Earthquakes;"
- "Perceptions of Experts on Earthquake-Related Knowledge;"
- "Tort Liability of Private Businesses and Industries for Earthquake Hazards and Losses—a Review of Current California Law;"
- "The Impact of Tort Liability on the Willingness of Companies to Mitigate Earthquake Hazards;" and
- "Approaches for Improving Tort Liability Effectiveness in Promoting Earthquake Safety."

ABAG also published an "Executive Summary." A workshop was held on April 13, 1984.



INTRODUCTION

A. Statement of Problem

Small and moderate damaging earthquakes will occur in California in the next few years. A major earthquake will probably occur before the end of the century. Businesses, industries, and utilities own and operate buildings and other facilities essential to the state and the nation's economic and social welfare. People work for, do business with, and depend on these companies. Many critical facilities, including hospitals and power plants, are operated by the private sector. Even in moderate earthquakes, some private facilities could suffer damage to their contents and surrounding areas, resulting in personal injury and death, and a disruption of vital services. Potential tort liability should be an incentive to prevent such death, injury, damage and disruption. Yet it may not function, or worse, may inhibit constructive action because of uncertainty about when tort liability exists or how it can be avoided.

Many companies want better information about their liability for earthquake hazards and how improved scientific and engineering knowledge of those hazards affects this liability. However, too little information was available about liability—how companies understood it, and how it influenced their behavior. This made it difficult for policy-makers to know if liability could be improved as an incentive for earthquake hazard mitigation or how to improve it.

B. Tort Law and Safety

A *tort* is a wrong or injury, other than a breach of contract or a criminal offense, for which the judicial system will provide a remedy. The *liability* which results from a tort is imposed on the entity which commits the tort (tortfeasor). Subject to available resources, the tortfeasor must pay the damages assessed by the judicial system. Tort law is that body of knowledge, usually expressed in the form of statutory and judicial *rules*, which determines when a tort has occurred and identifies the tortfeasor and the victim to whom damages are owed.

Tortfeasor is another name for “The Villian” if you are the one harmed – or “The Scapegoat” if you have just been accused.

JEANNE PERKINS
ABAG Earthquake Program Manager

The original purpose of English tort law may have been to achieve fairness on an individual basis. The underlying motives are not clear and may include compensation of the victim, punishment of the tortfeasor, and abstract concepts of equity.

By the Twentieth Century, tort law was seized upon as a means of promoting safety. This use of tort law is not necessarily incompatible with other statements of tort law's purpose. It does, however, make certain assumptions about the way members of society view and react to liabilities imposed by the tort law.

The use of tort law to promote safety assumes that (1) an actor (potential tortfeasor) can rationally and accurately identify and evaluate the cost of the potential risk (liability) inherent in a given course of action, (2) the same actor can rationally and accurately measure the cost of eliminating that liability, (3) the actor will rationally choose the cost effective course of action, and (4) tort law will consistently impose tort liability if the actor fails to so act and if damage in fact occurs as a result of the actor's negligence. Essentially, a potential tortfeasor's actions are scrutinized using a cost-benefit analysis and liability is imposed if he or she does not act in a manner dictated by that analysis. Therefore, if the cost of eliminating the risk exceeds the potential liability, neither the actor nor society has any incentive to achieve a higher level of safety, and negligence law will not impose liability. How-

ever, another theory of tort law, strict liability, may impose liability regardless of this analysis in order to promote other social goals.

C. Conclusions

Theoretically, the legal basis exists for imposing tort liability for earthquake-related injuries and damages on a wide range of potential defendants, including private businesses, design professionals, building owners and developers. A plaintiff can recover for an ever increasing variety of harms, including traditional compensatory damages for personal injury and property damage, as well as for emotional distress and economic harm. Further, new developments regarding punitive damages establish the possibility of recovering such damages in earthquake situations. The full gamut of legal liabilities is applicable, including *negligence* based on traditional notions of *breach of duty* and the emerging doctrine of *affirmative duty* recently hinted at in California caselaw. Further, *strict liability* theories such as products liability, employer's vicarious liability and workers' compensation are also available.

In none of these cases, can the legal defenses of *act of God*, contractual disclaimers of liability or contributory negligence automatically act to absolutely bar recovery. Rather, these defenses are available only in limited circumstances and may only act to reduce, not bar, recovery.

Tort law liability is uncertain. Extensive legal research by ABAG consultants indicates that there is only one minor case in the United States establishing tort liability for earthquake-related damages or injuries under a negligence standard. The only other cases imposing liability for earthquake-related damages are in the limited context of workers' compensation. This is true despite the fact that (1) the legal basis for imposing tort liability for earthquake-related injury and damages exists, (2) most of the commonly perceived legal defenses may be relatively ineffective, and (3) the state-of-the-art knowledge regarding earthquake hazards and mitigation measures establishes a possible basis for imposing legal liability.

Recent increases have been made in knowledge regarding (1) the probability of earthquakes of given magnitudes, (2) structural mitigation measures to lessen damage and injuries to building occupants, contents and bystanders, and (3) emergency preparedness measures to reduce the impact of earthquake damage. Much of this knowledge has been widely disseminated and may be part of a lay person's common knowledge. Finally, the experts are forming some consensus on some identified hazards and mitigation measures.

Part A reviews current tort law for potential theories upon which the victims of earthquake-related harm or damages may base a lawsuit. These theories are examined in

light of the potential claimants, the types of harm suffered by them and the availability of legal defenses. Based on legal principles of proof and evidence, information gleaned by ABAG from a written survey of professionals with expertise in earthquake hazards is reviewed for its usefulness in supporting potential tort claims.

Part B compares the theoretical and actual impact of tort liability rules on implementation of earthquake safety measures. First, tort liability rules are examined as safety enhancement mechanisms. Theoretically, the risk of potential tort liability and the resulting damages which may be recovered by a defendant ought to encourage potential tortfeasors to act in a safer manner than they might otherwise. However, there are also several non-liability-related potential motivations for private industry and businesses to undertake earthquake-related safety measures. Survey results indicate that non-liability motives dominate private sector decision-making in this area. One reason for the low priority of liability rules in decision-making apparently is the fact that the private sector

assumes risk taking as an integral part of daily operations. The response to potential risk is generally to shift liability through third party insurance or other contractual or organizational means. Second, the theoretical problems related to understanding liability rules and the ability of potential tortfeasors to function in the theoretically *correct* manner were mentioned in the survey results. However, they do not appear to be a major reason for why liability rules play such a small role in private sector decision-making.

Part C sets forth several hypothetical situations. The tort law as described in Part A and the theoretical and actual behavior patterns of the private sector in response to potential risk situations were applied to these hypothetical situations.

Part D evaluates several approaches for increasing the effectiveness of tort liability in encouraging implementation of earthquake safety measures. It begins with a review of the theoretical, and the apparent, reactions of individuals in the private sector to possible tort liability resulting from earthquake hazards. This information is supplemented with information from an earthquake liability workshop conducted by ABAG. Based on this evaluation and the direction of the project review committee, ABAG staff has instituted two major courses of action:

- educating the private sector regarding earthquake liability; and
- establishing a legal basis for immunizing design professionals, building owners and developers for tort liability for retrofitting buildings and structures to locally established life-safety standards.

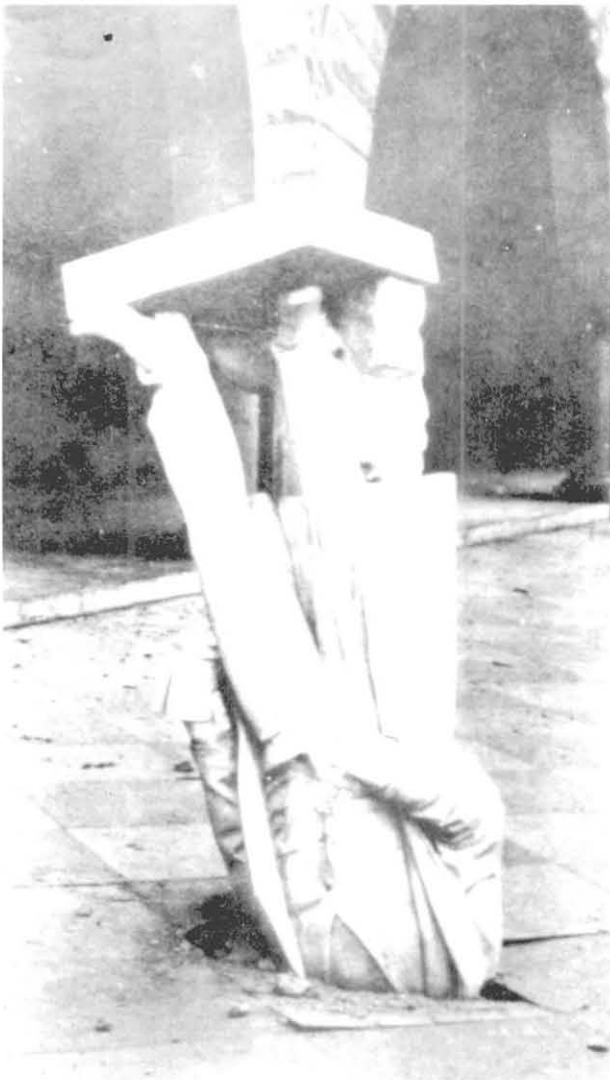


Photo courtesy of U. S. Geological Survey



PART A:

Legal Liability for Earthquake Hazards and Losses

I. Procedures and Substantive Rules

Each state differs as to the procedures for using the judicial system and the substantive tort law. An understanding of the basic procedure helps explain some of the substantive tort rules. Comments in this report regarding procedures and substantive legal rules are accurate for the State of California and are generally applicable in other states.

A. American Legal System

1. Pleadings

The victim of an alleged tort (plaintiff) may commence a lawsuit by filing appropriate papers (pleadings) with a court having the power (jurisdiction) to decide the issues raised. If the plaintiff is to recover damages in a court of law, it is essential that the initial pleading (complaint) alleges each of the *elements* of a tort.

The Elements of a Tort

1. A pertinent duty imposed on the alleged tortfeasor (defendant)
 2. A violation of that duty
 3. Damages or injuries sustained by the victim
 4. A causal connection between the defendant's negligent act and the harm suffered by the plaintiff
-

In response, the defendant may try to refute any of the *elements* and/or raise independent legal defenses.

2. Discovery/Evidence

After filing the initial pleadings and concluding the initial procedural maneuvering, each of the parties usually

starts the *discovery* process where each probes the other for the factual basis of its claim or defense. The myriad and complex rules governing the discovery process and the types of evidence which may be presented in a court of law are beyond the scope of this report. However, two specific methods of proving or refuting tort liability which would be particularly important in most earthquake-related tort claims are discussed in "Methods of Proof" (Section VII of this part).

3. Burden of Proof (Production and Persuasion)

Legal rules impose the *burden of proof* on either the plaintiff or the defendant in specific situations. The burden of proof is a two-part responsibility consisting of (1) the burden of producing the evidence to support a factual claim, and (2) the burden of persuading the judge or jury that the evidence presented is of sufficient credibility and weight.

The burden of producing the evidence necessary to sustain a factual claim usually falls on the party making that allegation. The evidence produced is evaluated under specific standards. The more common standard requires the responsible party to prove its point by a *preponderance of the evidence*. Note that the standard by which the evidence is evaluated is a *question of law* but the actual weighing of the evidence under the appropriate standard is a *question of fact*.

4. Questions of Fact — Jury

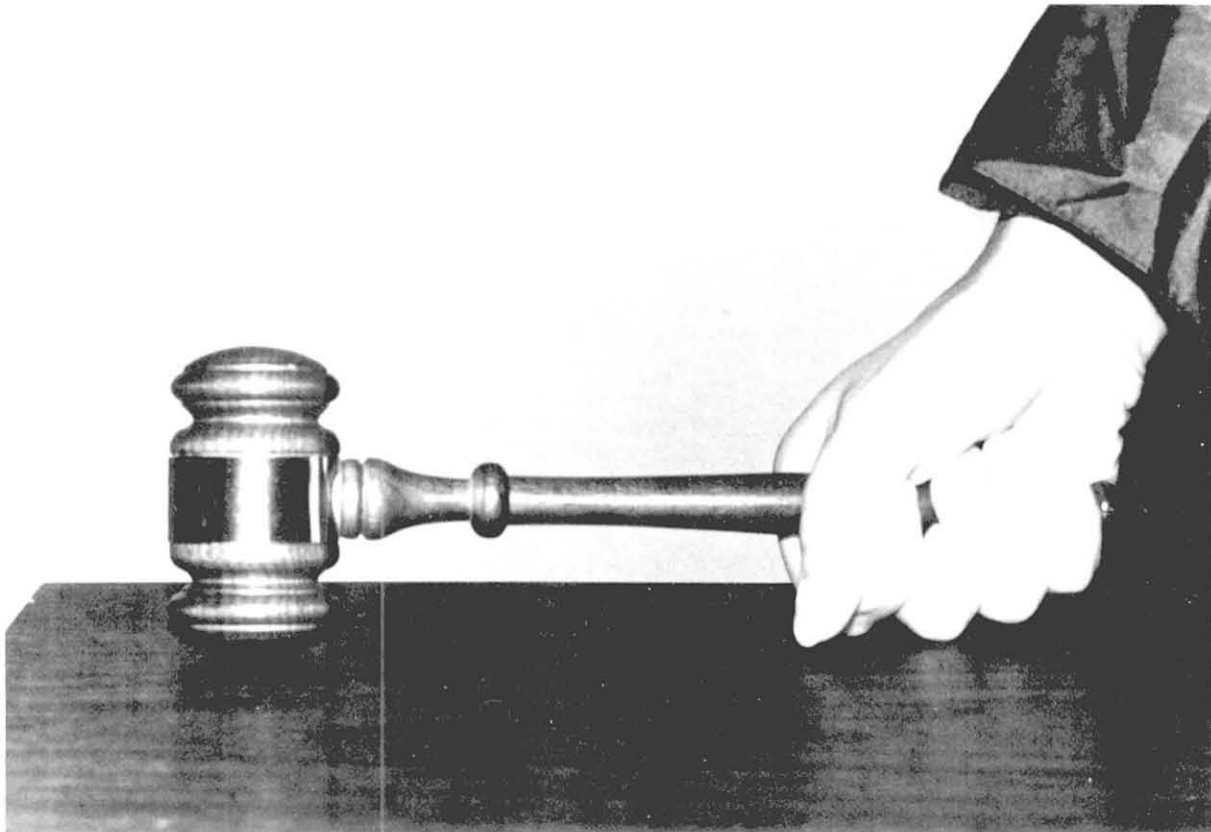
Questions of fact concern whether something is factually true or untrue, or whether something did or did not occur. These are the exclusive province of the jury except under extreme circumstances. Moreover, a determination of a *question of fact* in one case has no effect on other cases, unless another case involves the same parties, facts and issues. For example, a jury finding that XYZ Fabricators, Inc. could have added reinforcing structures to its build-

ing (1) is difficult to overturn on appeal and (2) has no weight in another trial where the question arises whether ABC Chemical Corporation could have added the same reinforcement to the same building.

However, some *questions of fact* determine legal outcomes. For example, if the jury concludes that, as a matter of fact, a *reasonable person* in XYZ Fabricators, Inc.'s position would have installed the reinforcing structures (and the relevant legal standard is the *reasonable person* rule), then, as a matter of law, XYZ Fabricators, Inc. was negligent if it did not install them. The legal community refers to such questions as "mixed questions of fact and law." A determination of such mixed questions, like those of pure fact questions, is limited in its effect.

5. Questions of Law — Judge

Determining *questions of law* is the exclusive province of the judge. If the judge's decision is appealed and upheld, it will generally be followed by other trial judges in other cases involving similar questions. For example, the question of whether, and if so, to what extent, the owner of a building has a *duty* to users and occupants to assure that the building is essentially safe, and the further question of what *standard of care* should be applied to an architect's work in designing a high-rise building along the San Andreas fault are *questions of law*. Once legal rules have been established, they will continue to apply in all similar cases until overturned by a higher court or by statute.



B. Negligence Standards

The negligence standard is a rule of law defining the standard by which a person's actions will be evaluated to determine whether a person has violated a duty to the victim and whether the person should be liable. Standards include the *reasonable person* rule and cost-benefit analysis.

1. Reasonable Person

Negligence consists of conduct "which falls below the standard established by law for the protection of others against unreasonable risk of harm." The standard by which conduct is measured has traditionally been the hypothetical behavior of the archetypal *reasonable person*. It remains an essentially intuitive or common-sense standard.

The "reasonable person" is the one judging your conduct from the jury box. Try to anticipate what he/she would have done and act accordingly.

EDWIN ROOKER
Claims Counsel for the Design
Professionals Insurance Company

Nonetheless, attempts to analyze the behavior of the *reasonable person* usually involve balancing four variables: (1) the apparent probability that the harm-causing event will occur; (2) whether the person actually knew, or should have known, of the risk; (3) the magnitude of the resulting harm; and (4) the effort required to implement adequate precautions. An underlying factor critical to this analytical process is the value society, or the judicial system, assigns to the potential harm and the effort necessary to avert it. In many respects, the cost-benefit analysis described below is a specific response to the question of how to value the benefits and harms.

Possible responses to the question of valuing benefits and harms are statutes or regulations which establish *minimum standards of care* for specific situations. For example, a city's building code could require some earthquake hazard mitigation measures. If a building is constructed in violation of that code section and injuries result during an earthquake, the plaintiff only needs to prove that the code was violated to prove negligence *per se*. In this instance, society (through the city council) has

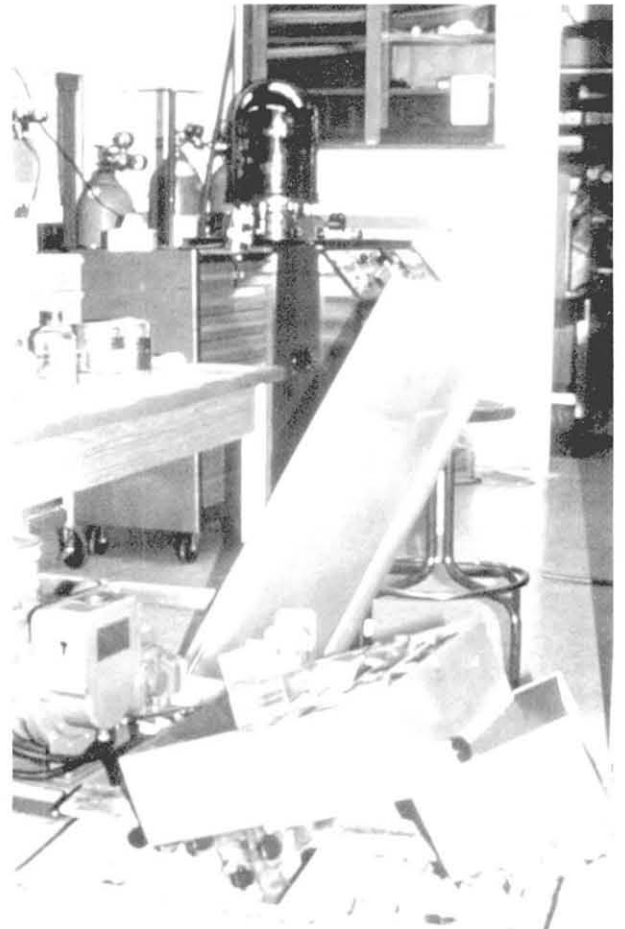
decided that the value of the extra safety of a properly constructed building is more than the cost of fully complying with the violated code conditions. It should be noted that this legal rule is only applicable if the harm suffered is the same type of harm which the statute or regulation was intended to prevent.

In a court case where the *reasonable person* standard is applied, the victim (plaintiff) would have the burden of producing evidence and persuading a jury by that evidence that:

- the tortfeasor (defendant) acted in a certain way;
- a *reasonable person* would have anticipated the possibility of the harm occurring;
- there were alternatives available to the defendant which would have averted the harm; and
- a *reasonable person* would have averted the harm.

2. Cost-Benefit Analysis

Theoretically, it is possible to evaluate in economic terms the size of the risk and potential benefits resulting from any given course of action. Under this type of analysis, it is assumed that the *reasonable person* would not take



that course of action if the risk exceeds the potential benefit and would take that course if the benefit exceeds the risk. Arguably, tort law should ordinarily act to encourage this *reasonable* behavior.

This type of analysis can be demonstrated by the following simple example. Assume the *reasonable person* wishes to build a storage facility for chemicals used in high-technology manufacturing. There is apparently one chance in a hundred that a magnitude 5.5 earthquake would result in injury to a third party or a third party's property in the amount of \$1 million. The added cost of modifying the facility to avert the risk is \$7,000. The economic magnitude of the risk is \$10,000 (one percent of \$1 million). Without tort liability, the reasonable person may be unwilling to incur the \$7,000 cost since the expenditure would benefit third parties and not him/her. If tort liability is taken into account, however, the reasonable person would be encouraged to expend \$7,000 to avoid a risk measured at \$10,000. If the same risk can be averted only by spending \$15,000, then tort negligence liability will not, by itself, usually induce the reasonable person to do so since it exceeds the economic value of the risk.

The propriety of using economic values to weigh the risk and benefit of conduct for negligence liability purposes is beyond the scope of this paper. However, it is important to determine whether or not economic cost-benefit analysis reflects the actual deterrent effect of tort liability on negligent behavior. An empirical University of Chicago study of automobile no-fault insurance legislation found that, compared to states without any no-fault automobile legislation, highway fatalities were 15 percent higher in states with a "strong" no-fault automobile insurance law and 10 percent higher in states with a "weak" version of such law. If one assumes that a high percentage of such accidents involve negligence, one may infer that the incentive of tort liability has some value in deterring dangerous behavior.

However, there are other reasons supporting the argument that a cost-benefit standard would not be successful in deterring dangerous behavior or promoting safety in all cases where it might be otherwise warranted. These are explored in detail in Part B, Sections I and II.

In a court case, the only difference between the cost-benefit and the *reasonable person* standard would be the emphasis that the plaintiff would place on the economic viability of the alternatives which could have prevented the harm and were not taken by the defendant.

C. Strict Liability Rules

For the purposes of this report, *strict tort liability* may be defined as the legal rules which impose tort liability without analyzing the quality of the alleged tortfeasor's behavior. The tortfeasor will be liable if (1) there is merely

the existence of a specific relationship between the alleged tortfeasor and the victim, or (2) the relationship exists and there is *indirect* or *circumstantial* proof that the tortfeasor's conduct is negligent.

1. Products Liability

Under California law, a *strict products liability* standard is applied to manufacturers of goods and others in the *stream of commerce* providing such goods to the ultimate consumer. The *strict products liability* rules are not *strict* in the sense that such purveyors are always liable, under tort law, for the damages caused by their products. Instead, the rule substitutes a *product defect* standard for a negligence standard.

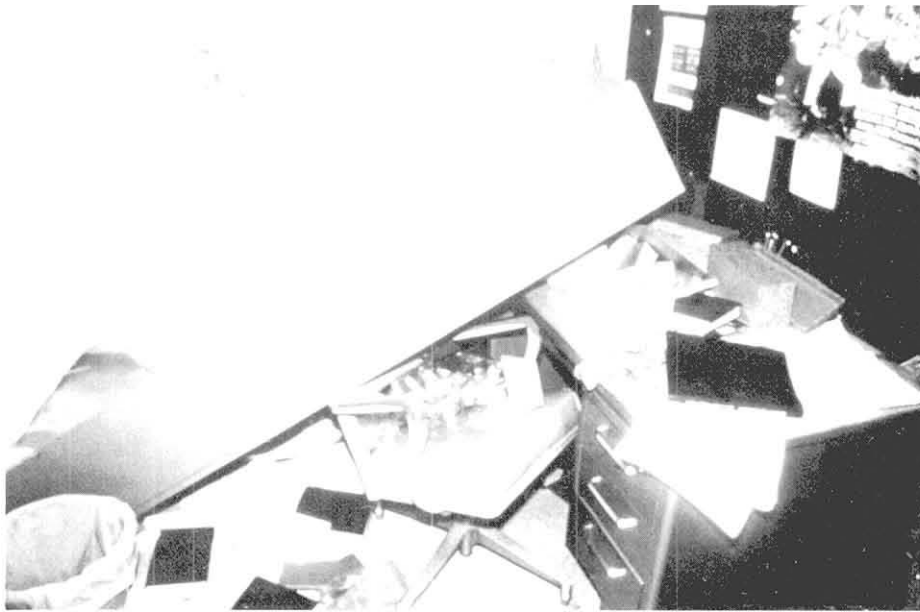
*A tort has nothing to do with the tortes
Europeans have for breakfast—unless
someone slips on it in the pastry shop, or it
has a needle in it, or the baker's employee
was hurt making it.*

ROD DIRIDON

*Santa Clara County Supervisor and
Review Committee Chairman*

Under this rule, the victim need only establish by a preponderance of the evidence the existence of some *defect* in the product in order to impose tort liability. As a practical matter, mere proof of the defect would not be sufficient to prove any actual negligence on the part of the manufacturer or other purveyors in the stream of commerce. Claimants under the *strict products liability* standard are afforded the protection of tort law under a lowered standard of proof for essentially three reasons:

- such evidence is almost always suggestive of some negligence for which the manufacturer, or others in the stream of commerce, may be held responsible under the negligence standard;
- some defects are an evil inherent in the mass manufacturing and mass marketing process which enables the manufacturer and purveyors to engage in their profit making activity; and
- the manufacturer and other purveyors are in a better position to spread the cost of the inherent risk by exacting a slightly higher price on each of the manufactured goods.



There are three types of *defects* under the *strict products liability* standard. First, a flaw in the particular product which differentiates that product from all other similar products sold by the manufacturer — *manufacturing defect*. Such defects almost always enter the product through some employee's negligence. Under the *vicarious liability* rule (see Section 3), the manufacturer would be liable if the victim can prove the actual negligence of the employee. In this instance, the *strict products liability* rule merely lowers the standard of proof applicable in this situation and does not appear to significantly expand the scope of the manufacturer's tort liability.

Second, a *design defect* is a particular design feature which does not meet a *risk-benefit analysis* standard. If the risk of a particular design feature outweighs its benefits, then it is defective. Again, the *strict products liability* standard does not appear to significantly expand the manufacturer's or purveyors' tort liability under a negligence standard.

Third, the product fails to carry an appropriate warning of a hazard of which the manufacturer knows or has reason to know. This liability almost exactly coincides with the obligation which negligence law would impose on a manufacturer.

2. Ultrahazardous Activity

Certain activities are viewed under tort law as being *ultrahazardous* or *abnormally dangerous*. In the event that harm or damage is caused by such activities, tort liability is automatically imposed. The plaintiff merely needs to prove that the activity (1) falls within the legal category of *ultrahazardous* or *abnormally dangerous* and (2) caused the harm for which the plaintiff seeks recovery.

The standard apparently accepted by most courts in California in determining whether an activity is either *ultrahazardous* or *abnormally dangerous* is that set forth in the First Restatement of Torts which defines such activity as one which "necessarily involves (a) risk of serious harm to the person, land or [personal property] of another which cannot be eliminated by the exercise of the utmost care and (b) is not a matter of common usage." The California courts have narrowly interpreted the definition of *ultrahazardous activity*.

3. Employers' Vicarious Liability

An employer is generally liable for torts committed by its employees within the scope of their employment under the concept of vicarious liability. The plaintiff must prove that the employee(s) acted negligently and that the activities were performed within the scope of the employee's employment. Once these two factors have been proven by a preponderance of the evidence, the employer is automatically liable for the damages resulting from that activity.

In practice, the vicarious liability rule does not expand an employer's liability as much as it may seem on first impression. In some instances, the employer would be liable even without the vicarious liability rule. For example, the employer's own negligence in selecting, training or supervising the employee may have contributed to the damages. In such cases, general negligence law principles would hold the employer liable and the vicarious liability rule only acts to remove the burden of proving the employer's negligence from the plaintiff.

On the other hand, the rule makes an employer liable in cases where the employer was not itself negligent but the employee was. To that extent, the vicarious liability rule is an expansion of an employer's liability beyond the scope of general negligence law.

4. Workers' Compensation

For the most part, the statutory scheme of workers' compensation makes an employer strictly liable for all injuries to employees, if the injuries occur "in the course of" and "arise out of" the employment. The plaintiff is not required to present evidence of any negligence, defect or ultrahazardous activity of any sort. Only extreme forms of employee misbehavior, such as voluntary intoxication or instigation of on-the-job fighting, are defenses to liability. The employee's own carelessness in causing the injury does not affect either the employee's ability to recover or the size of the damages. However, the statute itself restricts the amount of damages which the employee may recover. The employee may recover all direct medical expenses and a portion of lost wages computed according to a statutory formula and a statutory amount for wrongful death. Under certain circumstances an employee may recover for intangible detriments, for example, pain and suffering.

D. Statutory and Regulatory Standards

In many instances, a standard of conduct is established by statute, ordinance or regulation. In all cases, such standards of behavior are considered to be *minimum* standards. Failure to meet the statutory or regulatory requirements constitutes negligence *per se* and requires a finding of liability if the harm that results from the conduct which fails to meet such standards is the type of harm which the statute or regulation is intended to prevent.

However, compliance with the statute or regulation does not preclude a finding of negligence if, under the circumstances, a *reasonable person* would have taken additional precautions. Compliance with such a standard is only one part of a body of evidence considered by the jury. Despite the defendant's compliance with statutory or regulatory standards, when there are *special cir-*

cumstances in the case at hand which distinguish it from the general circumstances addressed by the statute or regulation, proving the defendant's negligence is easier. Further, although most statutes or regulations are *minimum* standards, there may be specific statutes or regulations which set standards otherwise applicable under judicial tort law. Compliance with such standards would be very strong evidence of non-negligence. (For fuller discussion, see "Tort Liability of Private Businesses and Industries for Earthquake Hazards and Losses — A Review of California Law," page 7-11).

E. Affirmative Duties

Ordinarily, under tort law, a person who fails to act to prevent harm or rescue personal property from damage is not liable for the harm or damage. A widely accepted exception to this general rule is "if the actor does an act, and subsequently realizes or should realize that it has created an unreasonable risk of causing physical harm to another, he (or she) is under a duty to exercise reasonable care to prevent the risk from taking effect" (affirmative duty). Also, if the court finds that there is a *special relationship* between two individuals, the court will also recognize that one of them has an affirmative duty to the other, and sometimes, even to third parties. The parent-child and doctor-patient relationships are prime examples of such *special relationships*. Finally, in California, recent decisions lead one to believe that the general rule of *no affirmative duty* is *morally questionable* and therefore subject to an expanding list of exceptions and qualifications.

Some statutes or regulations require individuals to take certain actions or behave in a certain manner. These may be viewed as *affirmative duties* although they are theoretically a mere codification of what a "reasonable person would do." (See Statutory and Regulatory Standards.)



II. Causation

A. Cause in Fact

A plaintiff must prove that there is a causal relationship between the act of the defendant and the harm suffered. In general, this is a *question of fact* for a jury to determine. The jury's analysis of whether this has been proved is guided by a rule of law which generally asks whether "but for" the defendant's negligent action, the plaintiff's injury would have occurred. In instances where the defendant/tortfeasor's *action* consists of a failure to act or to take reasonable precautions (whether or not it is labeled an *affirmative duty*), the guiding rule would be, "if the defendant had taken a non-negligent course of action, would the harm have been prevented?" Under these circumstances, the analysis is usually complex and highly uncertain.

B. Proximate Cause

While generally the issue of causation is one of fact for the jury, there are situations in which the court will rule that as a matter of law there is not sufficient causal connection between the defendant's acts and the harm suffered to support liability. In those instances, the court determines that the conduct of the defendant was, as a matter of law, not the *proximate cause* of the harm incurred. The rules governing whether there is *proximate cause* between the act complained of and the harm suffered are complex and beyond the scope of this report.



Photo courtesy of H. J. Degenkolb Associates, Engineers and William A. Milek

III. Parties

In certain situations, the relationship between the plaintiff/victim and the defendant/tortfeasor triggers special rules and regulations. One such instance has been described in "Workers' Compensation," where an employee sues the employer for injuries incurred in the course of or arising out of employment. Also noted previously, defendants who are the manufacturers or purveyors of mass produced consumer products ("Products Liability"), engaging in *ultrahazardous* activity ("Ultrahazardous Activity"), or the employer of a negligent employee acting within the scope of employment ("Employers' Vicarious Liability"), are judged under a special standard for the purposes of imposing tort liability. Finally, plaintiffs who successfully prove negligence *per se* due to the defendant's violation of a statute or regulation ("Statutory and Regulatory Standards") may be considered to have done so as the result of a *special relationship*.

A. Landowner as Defendant

There is a significant body of law governing tort claims between a plaintiff and a defendant who is a landowner. Basically, under the traditional rules, a defendant/landowner could be held liable for harm to a *trespasser* only if the defendant engaged in willful or wanton misconduct (or in the special instance of a child trespasser, if he maintained an *attractive nuisance*). A defendant/landowner could be held liable to a social guest (*licensee*) only for willful and wanton misconduct, and the failure to warn of a hidden danger or *trap*. Finally, a defendant/landowner may be liable to an individual invited onto the property for mutual business purposes (*invitee*) or members of the public who may lawfully and properly enter the property (*public invitees*) for any of the aforementioned reasons and the owner's failure to take reasonable action to keep the property in a reasonably safe condition (i.e. the normal negligence standards).

Except for codified exceptions (i.e., Civil Code Section 846), court cases in California have apparently abrogated the hard and fast rules which impose a different *standard of care* on the landowner depending on the relationship between the defendant/landowner and the plaintiff. Some states have followed California's lead in this regard. Some have partially adopted the California rule and others have either rejected it or deferred acting on the issue.

B. Developers and Design Professionals

Two concepts are of limited application, but have special significance for potential tort claims based on earthquake-related harm or damage. First, a land developer may be liable for the negligence of the architect, engineer and contractor under theories of non-delegable duty, implied warranty and strict liability. Second, architects, engineers and other professionals are themselves held to a *standard of performance* established by others in their profession.

The issue of "Liability for Earthquake Losses" should be renamed "How to Pick the Corporate Deep Pocket."

DOUG DETLING
ABAG Assistant to the Executive Director

IV. Type of Injury

A. Bodily Injury/Death

Except in cases of behavior which would warrant the imposition of punitive damages (see "Punitive Damages"), the type and extent of injury or harm suffered by the plaintiff determines the size of the recovery permitted by the judicial system. One of the most difficult tasks in the tort liability analysis is determining the size of the recovery for bodily injury or death to the victim.

Some aspects of the damages are easily measurable, e.g. direct medical costs, some types of prospective medical costs, and lost wages over a short period of time. However, other impacts of the injury/death may be difficult to measure economically. A classic example is valuing the death or permanent disability of an individual. It might reasonably be argued that the value of a human life or appropriate compensation for a person rendered a quadriplegic is astronomical. However, the tort liability system operates on the assumption that damages are both finite and measurable. Therefore, some recovery will always be permitted for such types of harm.

B. Property Damage

It is now well established under tort liability rules that a tortfeasor is liable for damage to the property of others. Classically, the legal system measures such damages in terms of an amount which would "make the victim whole." The method of determining compensation for property damage varies widely. For example, a cornice falls from a building during an earthquake and shatters the windshield of a car. The owner of the building may be liable for the cost of replacing the windshield. In some circumstances, the victim may have been made a bit "more than whole" by receiving a windshield in better condition than the one which had been broken. Such imprecision is tolerated on the theory that *but for* the defendant's negligence, there would be no need to replace the windshield.

In the more complex case, the damage is to unique property, the value of which is difficult to determine. For instance, assume that a commercial apple orchard is contaminated with chemicals which leaked from a nearby factory as a result of an earthquake. Are the damages owed to the owner of the apple orchard the current

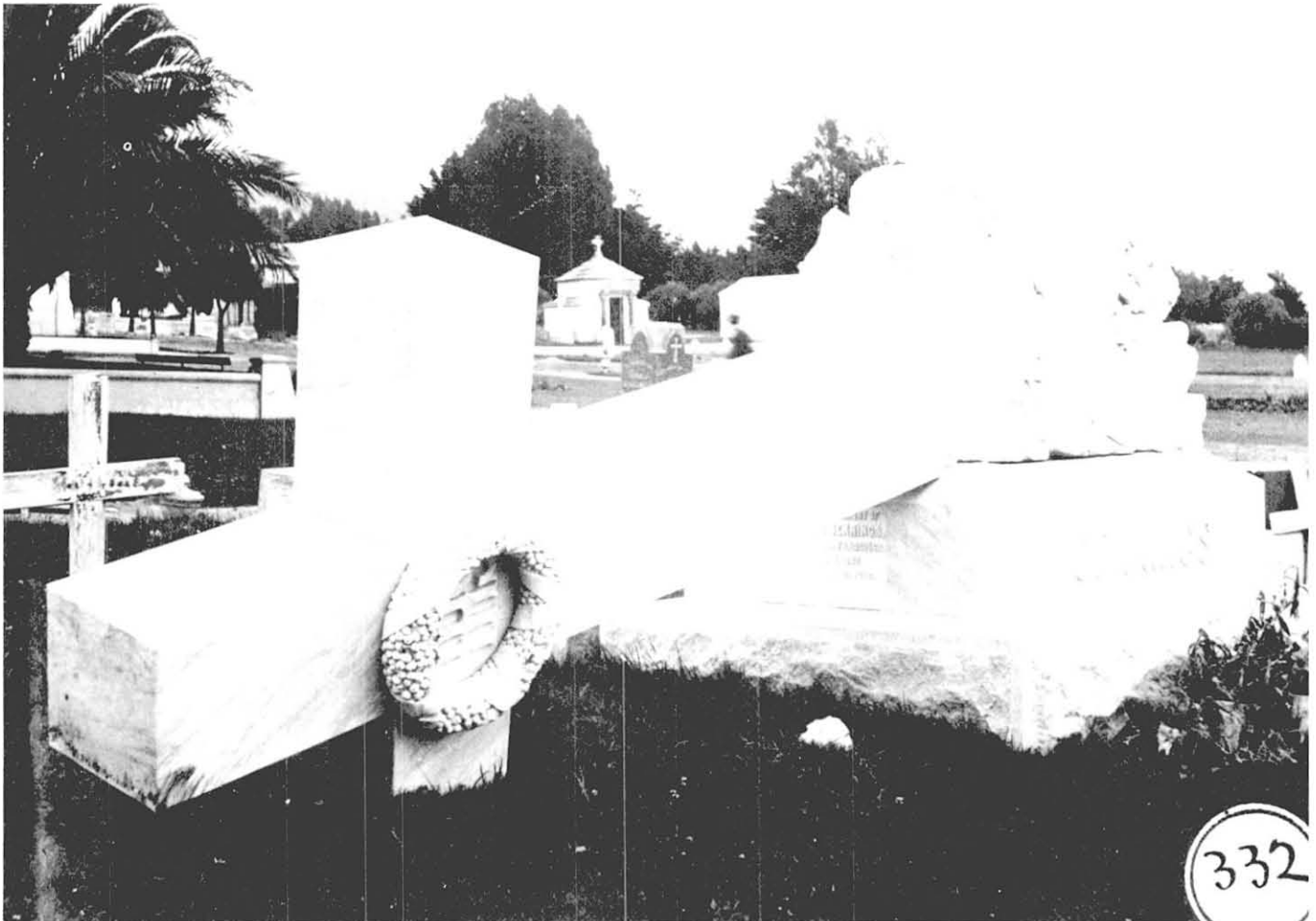


Photo courtesy of U. S. Geological Survey

market value of the orchard, the income the orchard owner would have earned over the next 5, 10, 15 or 20 years, or the cost of purchasing a comparable replacement apple orchard? The choice among such remedies is usually made on a case-by-case basis.

C. Emotional Distress

In California, a plaintiff's ability to recover monetary damages for the emotional distress which results from a defendant's negligence has been changing significantly over the past few decades. The fairly complex evolution of the widening basis for recovery of emotional distress damages can best be illustrated by way of the following example. Assume that a married couple, both of whom are professionals employed in the financial district of a major California city, are walking on the street of the financial district when a strong to moderate earthquake occurs. As a result of the earthquake, panes of glass are dislodged from a high-rise office building. One of the panes of glass strikes the husband, causing several deep gashes and lacerations over his entire body and head.

First, assume that the husband's injuries cause intense pain and suffering during the recuperation period and some residual pain for the remainder of his life, but heal without any permanent scarring. Under such circumstances, almost all American courts will permit the husband to recover monetary damages for the physical pain and suffering both during the recuperation period and thereafter.

Second, assume that all of the factors in the basic situation and the first example are true except that the husband now has severe facial scarring. The husband is embarrassed and severely distressed by the scars. In most American jurisdictions, he would be able to recover monetary damages for such embarrassment and distress.

Third, assume that the basic situation has occurred, except that the pane of glass crashes to the ground at the husband's feet and he is struck, but not cut, by flying shards. As a result of the accident, the husband now has a severe phobia about walking in the shadow of high-rise office buildings. The phobia further causes physical effects, such as a nervous tic and a stammer, so long as he is in the street in the presence of a high-rise building. The plaintiff will generally be able to recover monetary damages for the emotional distress of the phobia, as evidenced by the physical manifestations and which were caused by the impact of the pane of glass against his body.

Fourth, assume the same situation as above, except that this time there is a complete miss and no piece of glass ever strikes the plaintiff. American courts are divided as to whether the plaintiff can recover monetary damages for the phobia which manifests itself in the nervous tic and stammering when there is no physical contact between the negligent instrumentality (the piece of glass) and the plaintiff.



Fifth, assume the basic situation, except that now the wife is suing. She suffered a nervous breakdown and is unable to walk in the shadow of a high-rise office building without exhibiting nervous symptoms such as a tic or stammer. A limited number of jurisdictions, including California, will permit the recovery of monetary damages for the emotional distress evidenced by these physical symptoms when the plaintiff merely suffers as a result of observing the physical injury to a close relative. Further, in California, recent caselaw indicates that even without a physical manifestation of the emotional distress, the wife may be able to recover monetary damages.

D. Economic Harm

Under California law, economic losses such as lost earnings or profit are clearly recoverable as part of general damages in a suit for personal injury based on negligence. In suits for property damage based on negligence, routine or usual profits lost during the time necessary to repair or replace the property are also recoverable.

E. Injury to the Public

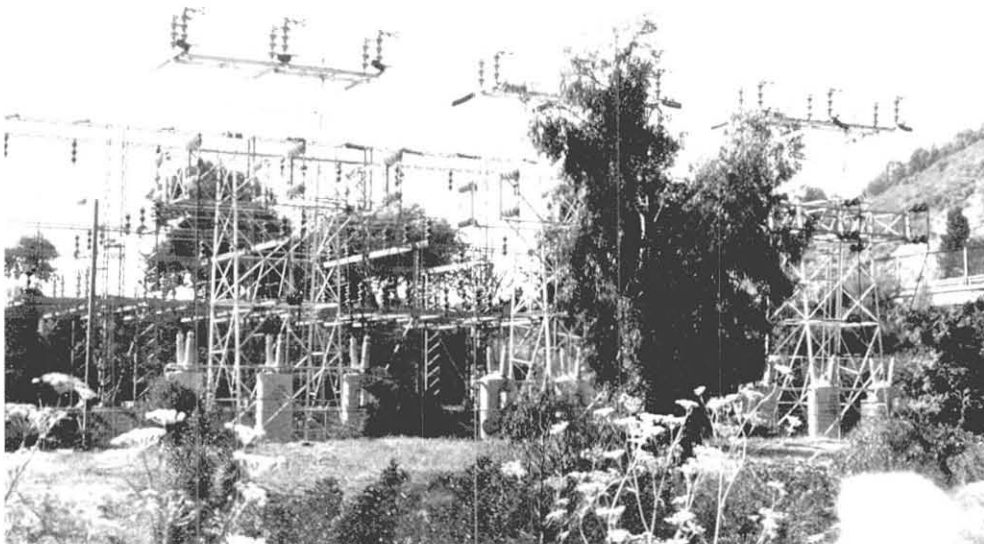
There may be circumstances under which earthquake-related harm affects a considerable number of persons. Under California Civil Code Section 3480, such an act by the tortfeasor may create a public nuisance. The only remedies for a public nuisance are abatement, injunction or a criminal sanction. A private party may not sue for damages unless it "shows some special injury, different in kind from that suffered by the general public." Recovery for damages in this kind of situation will depend on whether a court will recognize a more or less large group of persons which is different from the *general public*.

V. Punitive Damage

Tort law makes a distinction between *inadvertently* and *deliberately* risky conduct. If the negligent conduct is inadvertent, the plaintiff may recover the type of damages described above. Such damages are *compensatory*, inasmuch as they are theoretically designed to compensate the plaintiff for his/her injuries.

However, if the defendant's behavior can be labelled as deliberate or *reckless*, not only can the jury require the defendant to compensate the victim, it can also require that the defendant pay punitive damages. Such *damages* are theoretically designed to both punish and deter the defendant, and others similarly situated, from engaging in the same type of *reckless* behavior. Whether behavior can be termed reckless depends, in part, on the extent to which the defendant *deliberates* over the allegedly tortious act or omission.

For example, the owner of a building may be aware of the risk inherent in some of the structural features of that building. However, the owner decides that the *remedies* do not totally eliminate the risk and cause unacceptable distortions in the building. In such a case, a jury may label the risk/benefits decision making process as a *conscious disregard* for human safety and subject that individual to liability for punitive damages.



VI. Legal Defenses

A. Act of God

In non-legal terms, any natural phenomenon can be viewed as an *act of God*. In that sense, no one would be liable in tort for any damage which is *caused* by such an *act of God*. However, legally, the defense is available only if the consequences of that *act of God* could not have been anticipated and/or avoided using reasonable means. This conclusion, and the following discussion, are based on exhaustive legal research of the *act of God* defense in California caselaw and earthquake cases in all states.

For example, one may argue that damaging earthquakes are so likely to occur in California that the reasonably prudent person would always take precautionary measures to prevent or mitigate the harm or injury which might result from such an earthquake. Therefore, people operating under such circumstances owe a legal duty to foreseeable victims to take such precautionary measures. The failure to take these measures would be a breach of that duty and the basis for a claim of negligence.

A broad “act of God” defense may fly in some lower courts, but there is less than a 1-in-100 chance that the California Supreme Court would let such a ruling stand.

PROF. GARY SCHWARTZ
UCLA School of Law

The *act of God* defense is comprised of two specialized instances in which the defendant shows that: (1) the defendant has not breached any duty to the plaintiff; or (2) if the defendant has breached a duty, there is no causal connection between the defendant's negligent act and the harm suffered by the plaintiff. In essence, this defense consists of a successful refutation of the plaintiff's attempt to prove one of the required *elements* of a tort.

Given advances in technical information regarding the probability of earthquakes and their effects on structures, one may argue that a *reasonable person* would take some preventive or mitigation measures against injury and damage from *foreseeable* earthquakes. Therefore, a defendant has a duty to take reasonable precaution against the *foreseeable* harm from collapse of an old two-story un-

reinforced masonry building (circa 1925) located near a known trace of the San Andreas fault in Los Angeles during a 6.0 magnitude earthquake.

If the defendant has met its duty of care but the *act of God* circumvents such precautions and is the sole cause of the injury to the plaintiff, then there is no causal connection between the defendant's acts and the injury. For example, the defendant may not, under the *reasonable person* rule, be required to replace the building altogether. However, during a particular earthquake of magnitude 6.0 with an epicenter one mile away, the only way to avert this damage suffered by the plaintiff would have been to replace the building. There is probably no basis for liability. Moreover, in the event of a *great* earthquake (an 8.0+ magnitude quake of extended duration), one may question whether any act of the defendant could have avoided the resulting harm. In such circumstances, the *act of God* is the sole cause of the harm.

In summary, the *act of God* defense is available in only three situations: (1) the *act of God* itself is *foreseeable* and the defendant took all reasonable actions to prevent the harm from occurring but the *act of God* nonetheless caused harm or damage, or (2) the *act of God* is of such a type or magnitude as to be *unforeseeable* and the defendant has not acted in a negligent manner with respect to dealing with that phenomenon, or (3) the *act of God* is of such a type or magnitude as to be *unforeseeable* and the defendant has acted negligently but the negligence is not a cause of the damage or harm.

B. Statutes of Limitation

Statutes of limitation provide that legal action on a claim must commence within a certain time period. Such limitations are designed to prevent the prosecution of claims that have remained unasserted while evidence has been lost, memories abated and witnesses disappeared. Even if the claim is just, it is unjust not to put an adversary on notice to defend within the period of limitations. The right to be free of stale claims eventually prevails over the right to prosecute a claim.

The precise period of time applicable to a given action is, in California, established by statute. The statute of limitations “begins to run” (i.e., commencement date for determining the period of time) when a legal remedy is available. In tort cases, this usually occurs when the plaintiff discovers, or should have discovered, the harm or injury complained of. Under certain circumstances the statute of limitations may be *tolled*. For example, if the statute of limitations is for a five-year period, and the defendant is absent from the State of California for one year, the plaintiff has a total of six years in which to bring the suit. An enumeration of the various circumstances under which a statute of limitations may be tolled is beyond the scope of this Guide.

C. Disclaimers of Liability

Many businesses insert form provisions in their contracts in which: (1) the business asserts that it has no tort liability under specified, or all, circumstances (*disclaimers*); or (2) the other party to the contract agrees that it will reimburse the business for any claim against the business arising out of the contract (*hold harmless clauses*). Under California law, disclaimers of liability for negligence are invalid if they already "affect the public interest." It is clear that if the following six factors are present then such a disclaimer is ineffective:

- the business is generally suitable for public regulation;
- the service provided is of *great importance* to the public or a *practical necessity* for some members of the public;
- the defendant holds itself out as willing to provide this service to the general public;
- there is unequal bargaining power between the defendant and the victim;
- the disclaimer is included in a standard *form contract* lacking any arrangement whereby the disclaimer can be deleted; and
- the relationship between the defendant and the victim places the victim basically under the defendant's control.

To date, it is clear that California law will invalidate a tort negligence disclaimer even though the plaintiff does not establish all six of the criteria set forth above. However, it is unclear what combinations of less than six are needed to invalidate such disclaimers.

D. Contributory Negligence

If the plaintiff is also negligent and such negligence is a contributing cause of injury, then such contributory negligence may be a defense in an action based upon negligence of another. If contributory negligence is proven, it may bar or reduce the plaintiff's recovery. The modern trend is away from the use of contributory negligence as an absolute bar to recovery and toward a *comparative negligence* standard.

Under the latter system, a jury is asked to assign relative fault for the injury between the plaintiff and the defendant. In some states, damages are apportioned between the plaintiff and the defendant up to the point where the plaintiff's negligence is equal to or greater than that of the defendant. After that point, the plaintiff is barred from any recovery. In a small number of states, including California, damages are apportioned in direct relationship to fault.

VII. Methods of Proof

A. Background Knowledge

Background knowledge is that body of information which a jury uses to evaluate and analyze the evidence presented at a trial and which itself need not be proven at that trial. For example, if an earthquake causes panes of glass to fall from a high-rise office building, the plaintiff in a suit against the engineer for negligent design must prove that the method of securing the glass was negligent, but probably need not prove that glass is brittle and, once broken, very sharp. The latter is common knowledge and the court assumes this information can be employed by a jury without formal proof in a court of law.

In a written survey of 88 company officials and personal interviews of 107 such officials, ABAG sought information regarding their perception of earthquake hazards. In describing the level of awareness of earthquake hazards in their industry or profession, nearly half the company officials characterized awareness as moderately high. The same group also felt that an earthquake within their geographical area will occur within the next fifty years and cause moderate to severe property damage. The officials surveyed and interviewed also characterized earthquake awareness among the general public in California as very high. An untested question is the amount and type of information regarding earthquakes which a court will permit a lay jury to make use of as *common* or *background* knowledge in evaluating the evidence presented to them in a law suit seeking to impose tort liability for earthquake-related damages. The more information the court permits to enter as *common knowledge*, the easier will be the plaintiff's burden of proof.

B. Experts' Opinion

Conversely, the opinions and attitudes of experts in earthquake-related fields of knowledge and emergency services fields are important since a court of law will permit expert testimony on subjects sufficiently beyond common experience that such testimony would assist a jury in reaching conclusions of fact. Specific rules regarding the basis for expert testimony and how such experts may be used at trial are beyond the scope of this report.

VIII. General Experts' Opinions

ABAG, in conjunction with Solem & Associates and H. J. Degenkolb, developed and transmitted a written questionnaire to experts in geology, soils and foundation engineering, structural engineering, architecture, emergency services, emergency medicine, emergency response, finance and insurance. Of the 81 questionnaires transmitted, 47 were returned. The sample was selected for its expertise and interest in earthquake hazards and was not scientifically drawn nor large enough to permit sophisticated statistical analysis. However, the results provide a strong indication of the knowledge and attitudes of those professionally involved with earthquake hazards and earthquake hazard mitigation. The individuals surveyed probably form a core group of experts which would be drawn upon by both plaintiffs and defendants in an attempt to prove or disprove facts necessary to the imposition of tort liability under given circumstances. This section reviews the findings of the survey and gives a general outline of what may be a consensus on what might be reasonably expected in an earthquake and how one might reasonably avoid some of the hazards inherent in an earthquake.


A. Geologic Hazards

One portion of the survey was designed to determine the degree of hazard associated with particular geographic locations and geologic conditions for two specified types of structures.

Generally, the subgroup of experts in geology and soils and foundation engineering, and the entire group of experts, agreed in their subjective estimates of the extent of damage resulting from hazards posed by various geologic conditions. They felt that a damaging earthquake (magnitude 6 or more) on the San Andreas fault probably will occur within the next 10 years in the Los Angeles area. Such an earthquake was felt to be only slightly less likely to occur on that fault in the Central Coast area or in the San Francisco area in the same 10-year period.

The ranking by these experts of several hypothetical locations is shown below.

Experts' Ranking of Likelihood of Substantial Property Damage Occurring to a One-Story Wood-Frame Structure in the Event of a Magnitude 7+ Earthquake at Varying Locations

On a known active trace of the San Andreas Fault	Highest Likelihood of Damage	
On a site corresponding to an active fault trace shown on a map issued by the California State Geologist pursuant to the Alquist-Priolo Special Studies Zones Act		
In an area of Bay mud in the vicinity of San Francisco Bay		
100 feet from a major active fault on typical alluvial materials (valley soil)		
On loose well-graded, water-saturated sand in an area ten miles from a major active fault		
One mile from a major active fault on typical alluvial materials (valley soil)		
In the inundation area of a dam		
On a hillside with topographic features indicative of past, but not recent, landslides ten miles from a major active fault		
On the coast in an area identified as being subject to a 500-year tsunami (tidal wave)		
Ten miles from a major active fault on typical alluvial materials (valley soil)		
On bedrock on a hillside with no history of major landslides ten miles from a major active fault		
On loose well-graded, water-saturated sand in an area 100 miles from a major active fault		
100 miles from a major active fault on typical alluvial materials (valley soil)		Lowest Likelihood of Damage

B. Structural Hazards

Another portion of the survey was designed to determine the degree of hazard associated with particular types, designs and ages of structures at a single, given location during a magnitude 7 earthquake. This magnitude earthquake was chosen because of the likelihood of significant damage occurring over a fairly large area. Degree of hazards varied with building type and date of construction.

There is significant and frequent disagreement between the structural engineers and architects and the overall group in their respective evaluations of the hazards posed by specific types of structures. The respondents called Solem & Associates with the most questions or indicated the most uncertainty with their answers to this section.

Buildings designed to five times the code standard can still fall down in earthquakes.

HENRY DEGENKOLB
Structural Engineer

The performance of specific types of buildings under these circumstances varied greatly. However, for any particular type of building, the experts assigned similar ratings to a wide range of performance characteristics. For example, structural engineers and architects consistently rated a two-story, unreinforced masonry, wood floor and roof commercial structure built in 1925 as offering little or no protection and maximum resulting damage in terms of hazards to building occupants from building collapse, hazard to outside bystanders, damage to contents, and other hazards. The same subgroup consistently rated a public grammar school built in 1950 as performing well and affording good protection in terms of the same performance characteristics.

Structural engineers and architects, as well as the experts in related professions, gave poor ratings for most performance characteristics to the three types of unreinforced masonry buildings out of a list of 17 buildings of varying construction and age:

- a two-story commercial store and office, unreinforced masonry, wood floor and roof, built in 1925;
- a five-story apartment house, unreinforced masonry walls, steel beams and interior columns, wood floors and roof, built in 1925; and
- a twenty-story office building, structural steel frame, unreinforced masonry, built in 1927.

The structural engineers and architects also expected damage and poor building performance for several performance characteristics of three additional buildings:

- a one-story, industrial or commercial building, tilt-up walls, wood roof, built in 1978;
- a thirteen-story office building, reinforced concrete, built in 1970; and
- a twenty-story office building, reinforced concrete, curtain walls, built in 1967. (A similar building built in 1980 had a significantly better performance rating.)

The overall group tended to perceive potential problems with these buildings as not being particularly severe.

C. Emergency Preparedness

The survey was also designed to determine the necessity of selected emergency precautions and services for given types of facilities. Such precautions and services include emergency medicine, emergency response, emergency coordination and other related emergency functions.

As in the answers to the section on geologic conditions, the experts in emergency services, response and medicine, and the entire group of experts, generally agreed in their evaluation of the necessity of most emergency services and procedures. The entire group indicated that special design, bracing and anchoring of mechanical and electrical equipment is the most essential precaution or emergency service for nine of the ten facilities listed in the survey. Hospitals, more than other facilities listed, were believed to require a full range of emergency services and precautions.

Many precautions and services were felt to be essential for:

- a facility handling toxic or explosive materials;
- a telephone facility; and
- an energy system (used for electricity or natural gas distribution).

The entire group felt that several precautions were essential for an office building of eight or more stories. Moreover, it was the only type of facility to which the emergency personnel gave a higher rating on the need for certain emergency services and safety precautions than did the entire group of experts.

Moderate emergency capabilities were believed needed for a two-story commercial building and a single-story manufacturing plant. The least amount of on-site emergency capabilities were believed needed for a three-story apartment building and a single family home.

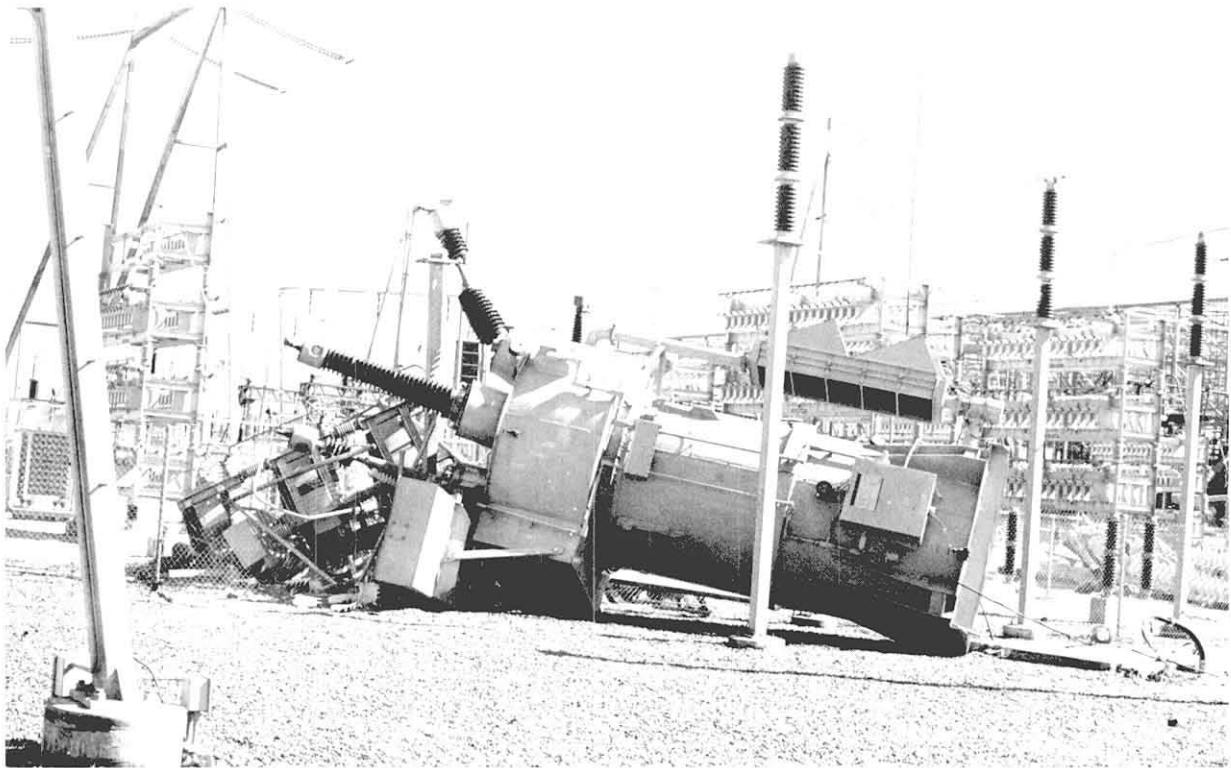


Photo courtesy of U. S. Geological Survey

It is when preventive measures fail that emergency response measures become important.

ROGER PULLEY
Senior Planner for California Office
of Emergency Services

D. Other Comments

The responses to open-ended questions on the source of the information used in answering the surveys were revealing. Most of the soils and foundation engineers and geologists cited published literature or a combination of literature and experience as sources for their responses while only a few cited personal opinion, experience or particular earthquake events. On the other hand, the structural engineers and architects tended to cite experience and opinion, rather than published data.

As noted previously, the tort liability of a non-expert will depend in part on whether a *reasonable person* would have acted on available knowledge regarding earthquake hazards and earthquake hazard mitigation measures to reduce the risk of harm or damage in a given situation. Knowledge based on personal experience or opinion of experts in specialized fields will probably be less supportive of findings of tort liability since that *knowledge* may be (1) less accessible to the average *reasonable person* and (2) less certain. The same conclusion should also be true in evaluating the potential liability of a design professional. However, in this instance, the lack of documentation affects whether the particular information would influence the *comparable* decisions of other professionals.

E. Consensus

This survey indicated a strong trend towards consensus among the recognized experts regarding the situations which constitute earthquake hazards and appropriate means of mitigating those hazards. This consensus may provide a strong evidentiary basis for establishing a professional *standard of conduct*. In a suit against professionals in the fields of architecture, structural engineering, emergency planning, etc., for negligent design or construction of a structure which *proximately causes* harm as a result of an earthquake event, such professionals may be held to that standard. Certainly in medical, legal and architectural malpractice cases, uncontradicted expert evidence is conclusive proof of prevailing standard of skill and learning in the locality.

F. Documentation

The credibility and weight to be given an expert's testimony relies in part on the expert's demonstrated expertise and, in part, on the information on which that expert bases his/her opinion. An expert's reliance on uncontradicted documentary evidence for his/her conclusion would usually be given greater weight by a lay jury. The extent to which some of the experts surveyed rely more heavily on documentary evidence for their conclusions may provide those groups of experts with greater credibility in a trial.

G. Dissemination

An expert is permitted to offer testimony only in those areas that are sufficiently beyond the common experience that the expert's opinion would assist the trier of fact. The extent to which specialized knowledge regarding earthquakes is disseminated to the public may create a foundation whereby the concurrence of an expert opinion will serve as conclusive evidence of the truth of that knowledge. For example, a commonly repeated precaution which should be observed in all earthquake-prone localities is the storage of water and food for a three day period, emergency medication and battery operated radio and lights. With the increasing dissemination of this advice, it is more likely to be perceived as a common sense response which any reasonable person living in an earthquake-prone area might take. An expert's opinion that such steps are highly desirable may very well set in the jury's mind that failure to take such steps is *unreasonable* and hence negligent.

Some Observations on the Probability of a Tort Claim

Throughout this discussion it is important to keep in mind that there is only one case in the United States establishing tort liability for earthquake-related damages or injuries. That case was a typical slip and fall in a retail store where the spilled product resulted from an earthquake. The only other cases imposing liability are in the limited context of workers' compensation. The conclusions are thus based on an analysis of general liability rules applied to natural hazards in contexts where it is expected that most of the harm from an earthquake will occur.

Lawsuits based on earthquake-related hazards or damages appear to be inevitable in the future for a number of reasons.

- The legal basis for imposing tort liability exists. The commonly perceived legal defenses, such as *act of God*, may be relatively ineffective.
- The apparent rapid progression in the state-of-the-art knowledge of earthquake hazards and mitigation measures makes it easier to establish a basis for imposing legal liability.
- The legal system has emerged as a potential tool for promoting safety, and is viewed as such by plaintiff's attorneys.

Interestingly, many of the company officials interviewed as part of this research effort offered their observations on the probability of a tort claim being made after an earthquake.

First, most such officials believed that large organizations, or organizations with large insurance policies, are more likely to be sued. They felt that potential plaintiffs are attracted to "deep pockets." Further, "deep pocket" organizations may be more willing to pay or to make

larger payments to plaintiffs to settle suits before trial. There is little empirical evidence to support these propositions. However, they may influence practical decisions on whether to sue and for what amount.

Second, these officials noted the general willingness of people to sue, while differentiating between urban and rural communities. The former was viewed as having a more litigious population than the latter. Further, even though a largely rural area may have a significant city located in it, the probability of an earthquake-related tort claim being filed in that city was believed to be low because of a perceived "sense of community" that lowered the willingness to sue.

Third, many respondents intuitively felt that injuries or damage from small or moderate earthquakes were more likely to result in tort claims than a larger earthquake. This common sense perception parallels the legal rules governing the manner in which the *act of God* defense operates. Respondents believed that no one could, or should, be held liable for injuries resulting from a truly cataclysmic event. Moreover, they felt that in the widespread catastrophe of a great earthquake, there would be little resources or attention which could be devoted to prosecuting, or paying, tort claims. However, where the natural event could have been anticipated and prepared for but was not, then liability should be imposed.

The key ingredients of a tort claim may have come together recently. A moderate earthquake occurred in the southern San Francisco Bay Area near the city of Morgan Hill in the spring of 1984. Some spectacular damage occurred to a few expensive new homes. ABAG staff has learned that some of those homeowners have retained legal counsel.



PART B:

Tort Liability as a Safety Incentive

I. Motives for Earthquake Safety

A. Theory

1. Tort Liability

As noted previously, tort liability may be used to promote safety. Presumably, in those instances where tort law is so used, the cost of taking the measures which would have avoided the harm or damage is weighed against the benefits from such measures. If the cost exceeds the benefits, negligence law would find no liability since society would not wish to encourage an inefficient use of resources. On the other hand, if the benefits outweigh the risks and the step has not been taken, tort liability would be imposed in order to encourage that tortfeasor and others like it to take the necessary measures. In theory, therefore, the presence of tort liability acts as a motivation for earthquake safety.

2. Non-Liability

There are also other factors motivating potential tortfeasors to take safety measures which are outside the tort law/liability realm. Such measures are not always compatible or consistent with the usual assumptions and findings of tort law.

(a) Self Preservation

Theoretically, the potential tortfeasor also has a natural desire to avoid injury to itself, its employees or property. The greater the potential damage that an accident would cause to a potential tortfeasor's own personal property, the less significant negligence tort liability will be in motivating that entity to take the appropriate safety measures.

(b) Economic — Contractual Obligation

A potential tortfeasor also has economic and contractual incentives to enact safety measures. First, where the potential tortfeasor is a business enterprise, use of safety measures which permit the entity to continue conducting business after a damaging earthquake has economic rewards. The economic motivation may overshadow or duplicate the incentive of potential tort liability. Second, where the potential victims of the tortfeasor's failure to take appropriate safety measures are clients or customers, the resulting adverse publicity which would result if the injuries and damages occur may cause such a significant loss of business as to make the tort liability incentive relatively insignificant.

(c) Regulatory Requirements

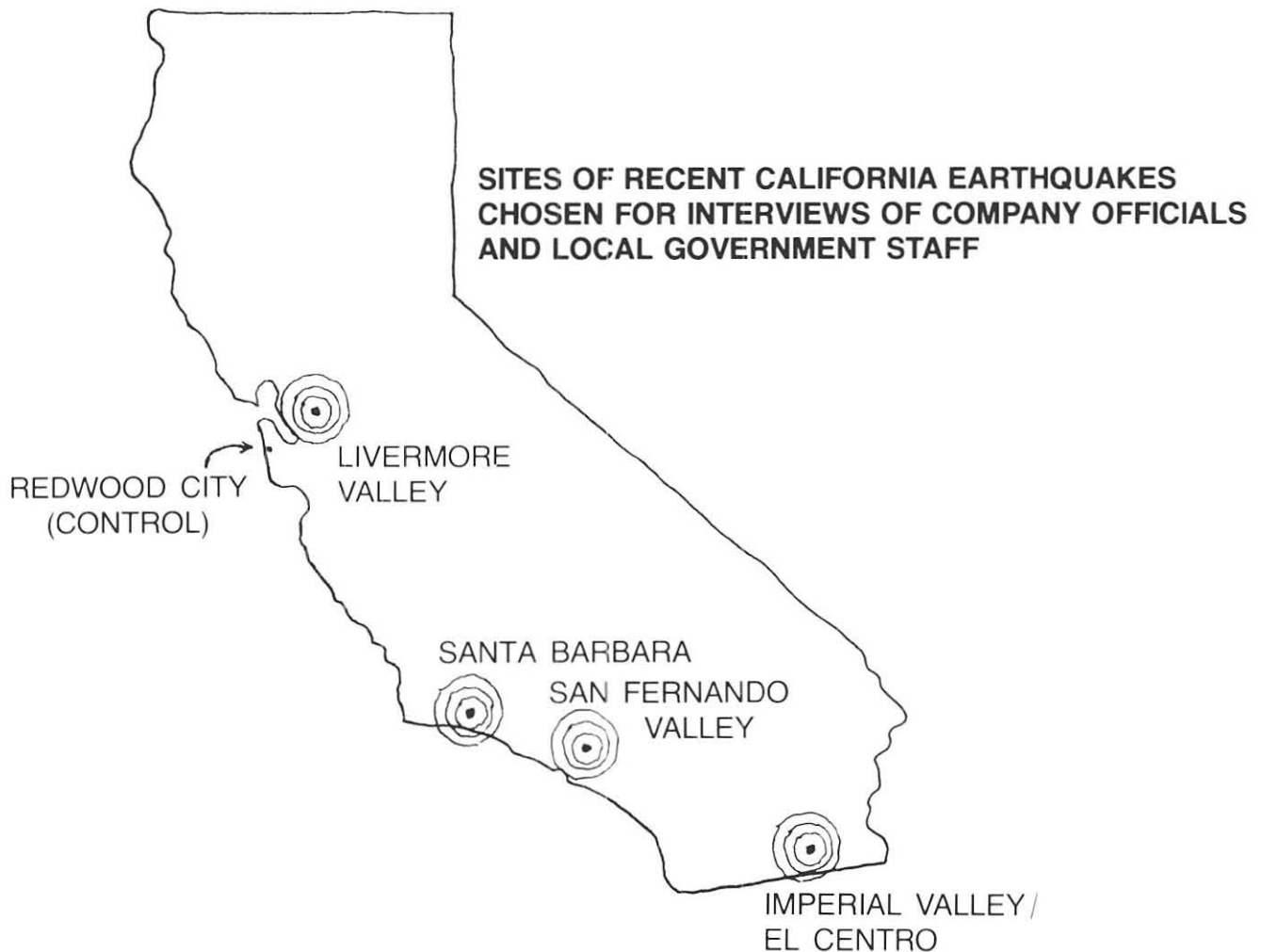
It has become increasingly common for the legislature to establish by statute or to authorize the adoption of regulations that establish a standard or level of safety which ought to be undertaken by private entities. As noted above, this effort may supplement the judicially imposed incentive for safety by providing a minimum standard whereby negligence can be measured. In addition, the regulatory scheme may include fines or penalties which provide additional incentives to take safety measures.

(d) Altruism

It is not unreasonable to assume that there is a certain amount of altruism on the part of some potential tortfeasors. Altruism renders tort liability less significant as an incentive for taking safety measures.

B. Survey Results

ABAG conducted a written survey and extensive site interviews to test the actual significance of tort liability as an incentive to taking safety measures. The written surveys were directed to three categories of individuals: (1) key company officials, (2) corporate legal counsel, and (3) design professionals. The in-person interviews were conducted with company officials and local government staff at four sites of recent earthquakes and a site without a recent earthquake for control purposes. The mail survey and interview samples were supplemented with additional interviews of company officials in selected business sectors. It is difficult to ascertain the degree to which the survey results may have been skewed by the fact that it originated from a governmental agency, by fears of "reprisal" or by a presumption that a "wrong" answer would prompt governmental regulatory action. However, it should be noted that despite the differences in sampling and survey methodology, the responses remained consistent.



The company officials interviewed expressed pride in their safety programs. The program emphasis tends to vary by type of business or industry. Earthquake safety programs of manufacturers and of electronics and other high technology industries emphasize worker safety, evacuation, emergency medical capabilities and fire control. Safety programs of business offices emphasize public safety, insurance, and records redundancy. Larger companies who could afford to have at least one person whose primary responsibility was safety or disaster preparedness tended to have more complete and more formal programs. Retail service businesses also tended to have more comprehensive programs, apparently because of their concern with worker safety and the volume of third parties (customers or visitors) passing through their premises. The companies with the most complete programs were usually the most highly regulated, and included hospitals, utilities, and companies handling large amounts of hazardous or nuclear materials.

The primary motivation for developing earthquake preparedness and general safety programs was never liability as perceived by the company officials interviewed. Liability was viewed as having a small to insignificant impact.

C. Conclusion

The survey apparently confirmed the possibility that non-liability incentives are more significant than tort liability in safety enhancement. Reasons for earthquake safety programs discovered in the legal research are similar to those mentioned by company officials.

Non-Liability Reasons for Earthquake Safety Programs

<i>From Legal Research</i>	<i>From Surveys and Interviews of Company Officials</i>
Economic/Contractual Incentives	<ul style="list-style-type: none"> - Good business practice — minimizing damage to the company's buildings and equipment and maximizing the ability to continue business operations and earn income - The public image resulting from acting, or not acting, responsibly
Regulatory Requirements	<ul style="list-style-type: none"> - Compliance with applicable regulations
Altruism	<ul style="list-style-type: none"> - Worker safety (i.e., concern for the well being of friends and associates) - Employee morale and union-management relations - Concern for public safety (visitors, customers and by-standers) - Key company officials who are personally committed to earthquake or disaster preparedness and provide needed leadership
Other	<ul style="list-style-type: none"> - Media publicity on the need for earthquake preparedness - Aggressive programs of the company's insurance carrier or local fire department

Christian Brothers

Historic Winery Closes



A structural report indicated that Greystone could not withstand a moderate earthquake

This newspaper article, which appeared in the March 8, 1984 edition of the *San Francisco Chronicle*, emphasizes the existence of unsafe buildings in earthquake country. Although winery officials expressed concern for the safety of their employees and thousands of visitors, the issue of potential liability was a part of the decision.

II. Effects of Liability Rules on Earthquake Safety Measures

A. Theoretical Deficiencies

Any theoretical consideration of tort liability rules as an incentive to undertaking safety measures must also consider some of the deficiencies inherent in such a framework. Previously this guide has discussed some practical reasons why tort liability is not necessarily a dominant incentive for earthquake safety. Theoretical defects may also directly undermine its effectiveness.

1. Uncertainty of Rules

First, tort liability rules themselves are both uncertain at any given moment and in a state of continuing change. To a certain extent, this uncertainty is inherent in any system which rests on an after-the-fact analysis of individual cases. It may be effectively argued that any uncertainty regarding the rules merely results from the failure of the defendant to accurately and adequately assess the situation to determine whether additional safety measures are warranted. This concept is more fully discussed below. However, tort law is also uncertain in that it can impose liability in areas where no liability previously existed. To that extent, there is true uncertainty as to whether liability is a concern when the defendant is acting in a certain arena.

2. Availability of Information

Second, the theory of negligence law operates on the assumption that the defendant has considered the probability and severity of the risk incurred and has evaluated the advantages and disadvantages of the available alternatives. This may not, in fact, be possible. Or, if it is possible, it may not be practical. Any given action can generate a virtually infinite range of potential liability. For every actor to fully analyze all the potential risks and each potential alternative would impose an enormous cost on every action. It is not always desirable to incur such cost. Therefore, a vast number of decisions are made without the full analysis upon which this theory of negligence law is premised.

3. Assumptions of *Rationality* and Inadvertence

Third, the theoretical model assumes the defendant acts in a rational manner and that there is no truly accidental or inadvertent action which disrupts the carefully laid plans of mice and men. It is safe to assume that there are some individuals in society who are not able or inclined to make the kind of calculations which are basic to the use of tort law as a safety incentive. Moreover, even individuals so inclined may very often find values that cannot be *rationaly* included in the tort law calculation may determine their actions. Under such circumstances, tort law provides no safety incentive.

By the same token, given the large number of risks which may result from any given activity, even if the individual is inclined to properly assess the risks and balance them against the benefits to be derived from additional safety measures, there may be times in which that entity inadvertently fails to recognize the risk. Again, tort law has no safety incentive effect on such situations.

4. Determining Damages

In certain instances, e.g. permanent disability and death, the damages awarded do not fully compensate the plaintiff for the harm incurred. Thus, tort law will provide an inadequate incentive for safety when a defendant's conduct creates a risk of death or very serious injury. This seems to be generally applicable to earthquake hazards.

5. Costs of Litigation

Finally, the use of tort law as a safety incentive does not explicitly take into account the cost of utilizing the judicial system to recover damages for injury or harm. To some extent, the cost of entering the system as a plaintiff is lessened by the willingness of some attorneys to prosecute the case on behalf of such plaintiffs on the basis of a contingency fee arrangement. To the extent to which the defendants are insured through third parties, the cost of defending a suit may be assumed by that company. Therefore, some marginal or meritless claims will be settled to avoid high legal fees or potential damages. Also, marginal or meritless defenses may be utilized to force a plaintiff to settle by raising the spectre of a protracted and expensive legal battle.

B. Survey Results

The surveys and interviews conducted by ABAG staff also revealed information regarding the extent to which liability rules affect the corporation's adoption of earthquake safety measures.

1. Concern for Liability

Over three-quarters of the design professionals had observed concern about potential liability for earthquake hazards within their company. Only two-fifths of the company officials surveyed had observed such concern. The absence of concern was generally attributed to the fact that liability had not occurred to the officials as an issue. In the interviews, many company officials noted that their concern was slight or non-existent because potential liability had been dealt with through the company's insurance, engineering design, or safety programs.

2. Uncertain Liability Rules

Close to three-quarters of both groups surveyed, as well as the company officials interviewed, felt that liability was so uncertain that it was difficult in many instances to predict the potential liability implications of their company's various activities. While almost three-quarters of the company officials surveyed believed that uncertainty about potential liability has little or no effect on company decisions, only half of the design professionals had such a belief. More than a quarter of these professionals felt that uncertainty about potential liability contributes to the mitigation of earthquake hazards by encouraging aggressive safety measures by the company. In the interviews, many company officials indicated that uncertainty caused them to use common sense, to try to act reasonably, and to purchase insurance.

3. Comprehension

Both the company officials surveyed and interviewed, as well as the design professionals, believed that they understood the general issue of liability and perhaps had a good understanding of some specific areas. Many of the officials interviewed also characterized their understanding of liability as detailed and complete. This greater understanding is probably due to ABAG's efforts to contact the people best suited in each company to respond to the questions.

Three-fifths of the company officials and design professionals surveyed believed that companies in California **could** be held liable for a negligent failure to reduce known earthquake hazards. Close to a third were uncertain whether companies would be held liable. Less than one-tenth felt that companies could not be held liable. The results of the interviews were similar. Company officials who were interviewed mentioned several situations where liability could exist, including a known hazard, a small earthquake, a large visible company, media publicity about mitigation, disregard for codes or regulations, and failure to be reasonable or use an appropriate standard of care.

Compared to those surveyed who did not note a concern within their company for liability for earthquake hazards, those who did tended to believe that seismic safety was a higher priority in their company and that their emergency preparedness program was stronger. However, no consistent relationship could be found between the perceived degree of liability for earthquake hazards or the uncertainty of general liability and a company's awareness of or response to earthquake hazards.

One effect of uncertain liability rules is to keep lawyers employed.

Anonymous Company Official Surveyed

C. Conclusion

As a practical matter, ABAG's sample appeared to reach sound conclusions regarding when tort liability would be imposed and treated such liability in a reasonable manner during the decision-making process. However, they apparently did so without thoroughly understanding the rationale behind liability rules. Moreover, the conclusion of the liability analysis was not the decisive factor in taking action; it was merely one factor of many in a more complex decision-making process. With the possible exception of products liability analysis, this treatment does not appear to conflict with the goal of liability as a safety enhancer.

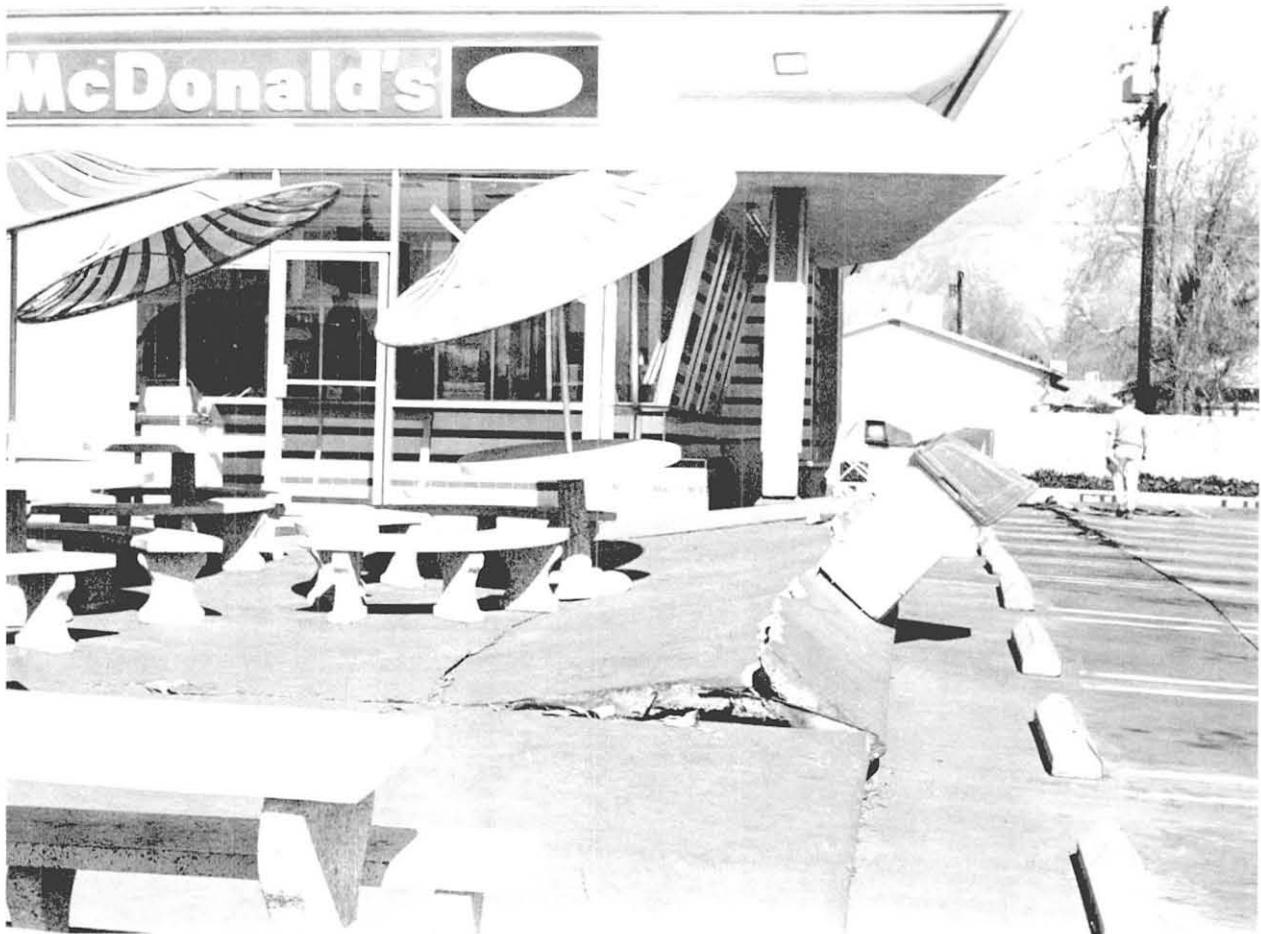


Photo courtesy of U. S. Geological Survey

III. Impacts of Liability Insurance and Risk Management

A. Theory

The tort negligence liability system tolerates, and in some instances encourages, use of liability insurance. By relieving the insured of the immediate burden of liability, such insurance generally greatly weakens the deterrence value of the negligence liability rule. For example, if a specific course of action incurs a \$10,000 risk which may be eliminated by a \$7,000 expenditure to take safety measures, the availability of liability insurance to assume the \$10,000 risk at a premium cost that is substantially less than \$7,000 greatly reduces the actor's incentive to spend the \$7,000 on safety measures. The insured perceives a net risk of zero compared to a \$7,000 safety expenditure. This perception may be incorrect under a more sophisticated analysis, but the extent that insurance actually reduces the incentives that would operate in the absence of insurance is well recognized in the economic literature; it is referred to as the problem of *moral hazard*. There are, however, several ways to reduce the impact of this *moral hazard*.

There is a misconception that insurance always makes the insured whole. For an operating business, there will be expenses, loss of time and costs that are not covered by insurance.

BRUCE OLIVER
Attorney for Kaiser Aluminum and
Chemical Corporation

First, it is clear that an actor is aware that the premiums paid on an insurance policy are not completely returned to him or her in the form of payouts. The insurance company utilizes a portion of the premiums to pay necessary overhead and produce a net profit. The actor may have enough assets to bear the prospect of a substantial tort judgment. In such a case, the defendant may well choose to dispense with third party insurance (and the associated costs). The actor will then *self-insure* by building up a reserve fund to cover some or all of the inherent risks in its activities. Self-insurance for the full range of risk incurred in the actor's activities eliminates the *moral hazard* problem altogether, and provides an incentive for the actor to reduce the costs of self-insurance by taking appropriate safety precautions.

Second, the insurance company may offer a policy with a significant deductible which represents the amount the actor is willing to self-insure. The deductible reduces the size of the premiums. The actor must build a reserve fund sufficient to cover the risks inherent in its activities up to the deductible amount. It can be said that the actor "retains some liability." The retention of some liability also represents a retention of some of the incentive produced by negligence tort liability to take safety measures where it would otherwise be economic and prudent to do so.

Third, an insurance company may base premiums charged to an insured on the insured's past record in incurring or avoiding negligence liability. The premium scale transmits, to some extent, the safety incentives normally produced by the tort liability system. However, it should be noted that the *experience rating* depends in a large part on the *credibility* of the insured's past experience in predicting future action. The larger the insured's operations, the more expansive and hence the more *credible* the *experience rating* will be.

Finally, if the physical conditions which may give rise to claims of negligence liability are *in place* at the time the actor applies for insurance, the insurer may be able to inspect those conditions and set a premium according to the liabilities that might arise therefrom. This will provide inducement for the actor to remedy hazardous conditions in order to reduce its premiums.

B. Survey Results

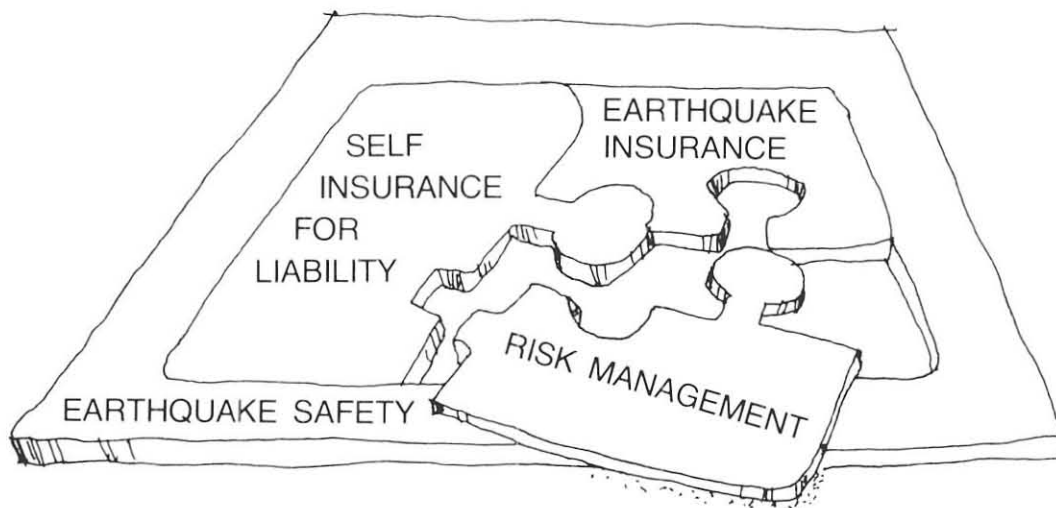
Two-fifths of the company officials surveyed worked for companies which were largely self-insuring for tort liabilities, while only 30% of the design professionals worked for such companies. Earthquake insurance for property damage was more common among companies surveyed in general (30+ %) than those of the design professionals (less than 10%). Similarly, business disruption insurance or insurance for consequential economic loss was four times more common among companies surveyed in general than for those of the design professionals.

One-fourth of the design professionals noted that their company had a formal risk management program, while more than one-third of the company officials surveyed noted that their company had such a program. More than half of those working for companies with such a program believed that it had increased the awareness of their company's officials of liability as a factor in decision-making to a substantial degree.

Companies surveyed which had self-insurance for tort liability, earthquake insurance and formal risk management programs tended to have more comprehensive earthquake preparedness programs than average. This relationship may be due to the higher occurrence of all three programs among large companies, rather than a cause-and-effect relationship existing between insurance coverage or risk management and exemplary earthquake preparedness.

C. Conclusion

As noted, liability is just one factor in the decision-making process. Part of the reason for the role it plays may be attributed to business' ability to cover the liability risk through insurance. In theory, insurance companies can use several mechanisms to promote earthquake safety measures. In practice, it is unclear whether it is these mechanisms, or other factors coincident with the presence of earthquake insurance, self-insurance, and risk management programs, which promote earthquake preparedness in some companies.





PART C: Analysis of Hypothetical Situations

Since one can better understand liability concepts through the use of examples, this section analyzes several hypothetical situations in terms of the possible theories available to a potential plaintiff in claiming tort liability against potential defendants. The analysis draws upon the legal theories previously discussed as well as some of ABAG's factual findings from its surveys and site interviews. These hypothetical situations focus on earthquake liability and earthquake safety issues. Other bases for tort liability may exist in a situation but will not be analyzed.

Courts Consider Other Issues Besides Earthquake Losses

This project focused on the effectiveness and appropriateness of using tort liability to encourage the private sector to make greater efforts in mitigating earthquake hazards. In this process, tort rules were reviewed and analyzed as a basis for imposing liability for earthquake harm and damages. The legal research indicated that tort rules can serve as a basis for recovery in a variety of circumstances. Thus, in analyzing this series of hypothetical situations, tentative conclusions are drawn that indicate whether tort liability is a certainty, a possibility, or nonexistent.

However, it should be noted that this type of analysis serves to emphasize the availability of tort liability as a safety enhancement mechanism. In any actual lawsuit brought under the circumstances described, the following additional factors come into play.

- The plaintiff will allege more than just earthquake liability as a basis for recovery.
- The defendants will urge the court to balance the technical and social benefits not related to earthquake safety which result from the allegedly negligent behavior against the earthquake-related benefits of the acts the defendant could have taken.

Thus, the legal analysis of these hypothetical situations is incomplete; some legal and social considerations which are not based on earthquake hazards and mitigation measures are not fully explored. Where a court concludes that it was *reasonable* for the defendant to opt for a course of action that increases (or fails to reduce) earthquake hazards in order to serve some other technical or social purpose, no liability for negligence will be imposed.

I. Hypothetical Situation A: Older High-Rise Office Building

The company knows, either from its design professional or by a public inspection, that its high-rise office building is hazardous and could suffer damage in a moderate earthquake—either because of the facility's design inadequacy or geologic setting. The company takes no action and a moderate earthquake then occurs, resulting in many injuries and deaths among its employees, lessees and members of the public. Building occupants trapped in the upper stories for extended periods suffer extreme psychological distress.



The company may be negligent in tolerating the danger resulting either from the building's inadequate design or geologic setting. In deciding this question, the jury must analyze the company's actual behavior under the *reasonable person* standard.

If the original problem is a design inadequacy, three pertinent issues are raised.

- Is the design inadequacy one of which the company knew or should have known at the time the building was built?
- At the time the company knew, or should have known, of the inadequacy, what actions were available to the company to eliminate the design inadequacy (i.e., redesign or structural retrofitting of the building), or to reduce or eliminate the risk posed by the design inadequacy (i.e., close the building down, institute earthquake safety drills or other emergency services precautions)?
- What are the benefits of these remedial measures weighed against the cost of instituting such measures?

In analyzing these issues, the standards by which the company will be judged are supplied by the testimony of expert witnesses. Typical questions raised are the following. (1) Did the architectural and/or engineering design meet professional standards? (2) What design or retrofitting options were available either at the time of construction or at the time the company learned of the design inadequacy? (3) How effective are the alternative emergency services measures? As noted previously, if the company is also the building developer, it may be held liable for the negligence of the professionals who contract with it to construct and design the building under legal theories of nondelegable duty, implied warranty or strict liability.

If the negligence lies in the selection of the site for the building, the foregoing analysis still applies. However, it should be noted that the practical alternatives are available primarily during the design phase when the building could have been relocated.

Proving the magnitude of the risk of an earthquake poses an interesting question. The possibility of the occurrence of an earthquake of a specific magnitude at the location of the building can be assessed in light of expert testimony from seismologists, geologists and the like. However, the extent to which such information is disseminated by such experts to the general public may render the jury less susceptible to expert testimony evidence.

The company may raise the *act of God* defense to liability based on negligence. However, as noted above, this defense is merely an instance in which negligence may be disproved based upon the fact that (1) the earthquake was of such a type and magnitude that it was not *foreseeable* and hence the plaintiff did not owe a duty of care to the defendant, and (2) the earthquake, independent of any act (or any reasonable precautions which could have been taken) by the defendant, is solely responsible for the injury or harm.

For example, if a very *foreseeable* earthquake of magnitude 6 causes the damage, the *act of God* defense may not be available. On the other hand, a less *foreseeable* magnitude 8.5 earthquake may very well be an *act of God* which is so severe that it would have overcome any reasonable safety precautions.

In ABAG's survey of company officials and design professionals, a significant majority of each group believed that both the designers of a building and the consultants who discover earthquake hazards in it would probably not or definitely **not** be liable in tort for harm arising in a similar situation. However, a significant majority of each group believed the building owner would probably, or definitely, be liable.

Under California law, it is unclear whether a disclaimer of liability in a lease between the company and lessees in the building would be valid. In any event, such a disclaimer would not protect the company from suits by its own employees, guests, invitees and customers of the lessees or the company, the lessees' employees or the general public.

It is fairly clear that the victims of the earthquake may recover for emotional distress. If the victim is an employee and the emotional distress produces an occupational disability, the victim can recover.

Under the circumstances, the plaintiff may request the imposition of punitive damages on the company. The viability of a punitive damages claim is unclear.

II. Hypothetical Situation B: Rehabilitated Unreinforced Masonry Hotel

The owner of a private residential hotel of unreinforced masonry knows that there is a significant risk of damage in an earthquake. The City has no program (as permitted by California law) to require upgrade of private buildings to a life-safety standard rather than full current Uniform Building Code compliance. Although the building owner is not required by the Code to do any rehabilitation, he chooses, on the advice of design professionals, to spend 10 percent of the money required for complete compliance with the current Code to achieve 80 percent safety. An earthquake occurs and there are some severe injuries, though substantially fewer casualties than in other similar buildings where no rehabilitation had occurred.



The analysis of this hypothetical situation is similar to that applied to Hypothetical Situation A. Two factual differences, and their impact on the analysis, should be noted.

First, the fact that the owner of the property in Hypothetical Situation B took affirmative action rather than failing to act as did the company in Hypothetical Situation A does not significantly change the analysis. The issue merely changes from "was it negligent to take no action?" to "was it negligent to undertake only limited rehabilitation?" The types of evidence available to answer the latter question include all of the types of evidence available to answer the first question.

Second, additional standards are available, i.e. the Uniform Building Code and the California law permitting updating of buildings to life-safety standards. Usually, the defendant's negligence is presumed if it does not comply with an applicable statute or regulation and the non-compliance causes the kind of harm which the statute or regulation was designed to avoid. In this instance, the standards established by the Uniform Building Code do not require any action on the part of the defendant. Therefore, it is not applicable and there is no negligence *per se*.

However, the standards established by the building code requirements may be evidence relevant to determining the appropriate standards of behavior in this situation. Moreover, this assertion may be bolstered by the life-safety standards legislation. If the intent of the legislation is to emphasize that even partial adherence to current building code requirements is desirable, then the probability that the building code is relevant evidence is increased.

With reference to the possibility of punitive damages in this situation, it is clear that the building owner made very conscious and deliberative decisions regarding the relative weight of the cost of remedial action and the resulting increased safety. Implicitly, the building owner would have had to spend nine times as much in order to achieve one-quarter again as much safety as the work actually performed. In light of current decisions under California law, this type of tradeoff would probably not support the imposition of punitive damages.

In ABAG's survey of company officials and design professionals, a significant majority in each group believed the design professionals would probably, or definitely, not be liable in tort under similar circumstances. A slim majority in each group made the same prognosis of the building owners' liability.

III. Hypothetical Situation C: Rehabilitated Unreinforced Masonry Hotel

Same as above, but the City has a program, and the building rehabilitation meets the life-safety standards prescribed.

This situation emphasizes that mere compliance with an applicable statute or regulation which seeks to avoid the harm that ultimately results does not insulate a defendant from liability.

Seismic balance

IF THERE WERE a Richter scale for political earthquakes, Palo Alto's proposed ordinance on seismic safety last year would have registered an 8.4. The business community was doing the shaking — with anger.

After a few aftershocks and several months, the city's Seismic Safety Committee this week suggested a compromise that should satisfy the protesting property owners in a way that will improve the overall seismic safety of the city.

The original proposal would have required all commercial buildings to be made stable enough to withstand a strong earthquake, specifically, any unreinforced masonry building built before 1935 would have to be repaired. Since many of the buildings in downtown Palo Alto fall into that category, a flurry of objections issued forth from the business community.

The committee's alternative would in-

stead require that all commercial buildings, old and new, be inspected by structural engineers, and that the report on each building be on file at City Hall. No owner would be required to repair a seismically unsafe building, unless remodeling was done.

The original requirement would have meant huge costs and untimely disruptions for many downtown businesses. But the new version doesn't get the property owners completely off the hook. As committee Chairman John Northway pointed out, a property owner will realize that a seismically hazardous building's resale value will drop and its owner's insurance costs and injury liability will rise.

Any ordinance involving seismic safety involves considerable guesswork. No one knows how forcefully The Big One will hit Palo Alto. The ordinance must work to reduce hazards, but without creating huge cost burdens. The committee's proposal does that; it deserves the City Council's careful consideration.

This newspaper article, which appeared in the October 21, 1983 edition of the *Peninsula Times-Tribune* (Palo Alto, California), points out the inevitable controversy surrounding the adoption of retrofitting requirements. Complying with such an ordinance does not ensure that the building owner, as well as the design professional overseeing the

work, are shielded from liability. In the interest of fairness and of encouraging businesses to support the adoption of such local ordinances, ABAG advocates changes in existing California law to remove the threat of liability when buildings are retrofitted to locally established standards. (See Part D.)

IV. Hypothetical Situation D: New High-Rise Office Building

The professionals designing a 10-story office building comply with the prescriptive standards in all local building codes as interpreted by the city staff. The professionals know, and advise the owner or builder, that greater safety could be achieved with state-of-the-art design and construction techniques at little (5%) additional cost, but the owner elects to minimize costs. The suburban city building department approves the design. After construction and occupancy, there is a moderate-to-strong earthquake, and an expert states that significantly greater injuries and damage to property of third parties (occupants and strangers) occurred because state-of-the-art techniques were not used.



There are two areas of analysis in this hypothetical situation.

- Are the design professionals' actions in recommending and not implementing the *state-of-the-art* design negligent?
- Is the owner's decision to utilize the more conventional design negligent?

In analyzing the first issue, it is necessary to elaborate on the term *state-of-the-art*. In this context, it can mean practices or techniques which are not used or applied in all situations and which have been recently developed. This becomes important in light of the standards by which a design professional will be judged. That standard is usually stated to be the care that is ordinarily exer-

cised in like cases by reputable members of the same profession practicing in the same or similar localities. The design professionals' actions can be summarized as follows: (1) notification to the owner of the increased safety resulting from advanced design techniques; and (2) preparation of a more conventional design pursuant to the owner's request.

There is no indication in the hypothetical situation that the design actually rendered is, in and of itself, below the normal standards of the professionals in that or similar localities. If it is, then it is clearly negligent and the design professionals incur liability both to the third parties who are injured as a result of the earthquake and the building owner.

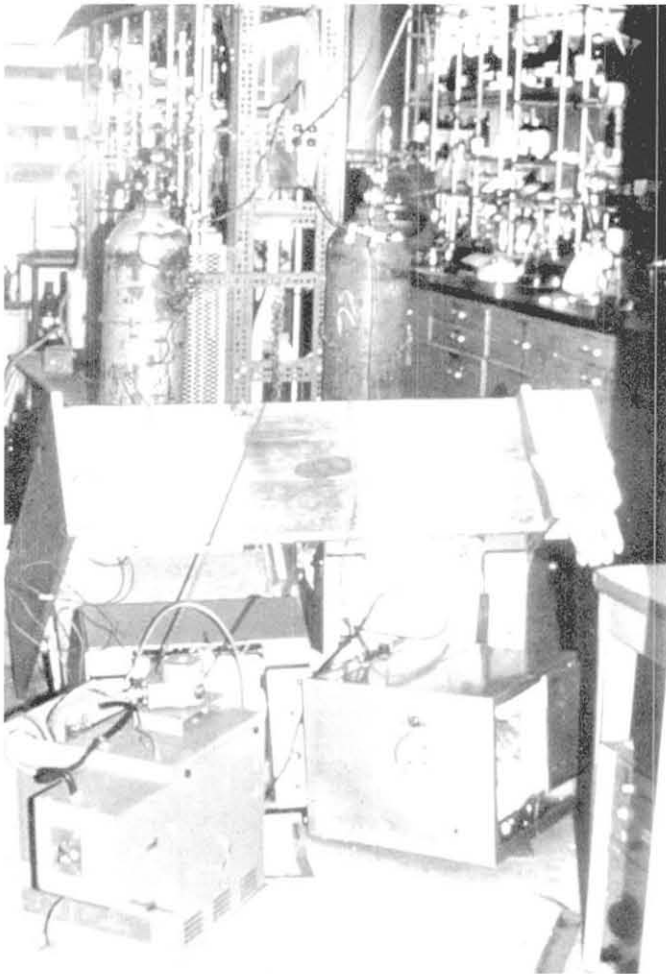
However, if the conventional design is professionally sound, the critical question is whether a responsible professional in the same or similar locality in the ordinary exercise of due care would have *done more* than note the availability of advanced design techniques and their benefits. Additional measures which the design professional might have taken are: (1) recommend that the owner use state-of-the-art techniques; (2) limit his/her role to being advisory with decisions to be made by the owner; or (3) refuse to continue working for the owner unless the advanced design is chosen. The latter step seems extreme and may create practical and professional problems. However, employing either of the other two steps may very well be a standard by which similar professionals act. If so, then the design professional in this hypothetical situation is negligent. It should be noted that mere compliance with the local building code may be introduced as evidence of non-negligence. However, such evidence is not conclusive.

In analyzing the second issue, it should be noted that the building owner may be liable if the architect is negligent under the legal theories previously discussed. Further, if the architect took any steps to strongly recommend the state-of-the-art design or demand a disclaimer before designing along more conventional lines, he/she may have effectively taken all *reasonable steps* and caused the owner to take *unreasonable steps* which would constitute negligence. Moreover, given the apparent cost of the mitigating designs, there is a distinct possibility of punitive damages being imposed against the owner.

In ABAG's survey of company officials and design professionals, a significant majority of each group believed the design professionals would probably, or definitely, **not** be held liable. There was no consensus of the survey sample on the issue of the building owner's liability.

V. Hypothetical Situation E: Hospital Facility

The private hospital board knows that its facilities are located in an area where violent earthquake shaking must be anticipated. During a moderate-to-large earthquake, the resulting ground shaking and ground displacement causes dysfunctions in use, e.g. rolling beds, destruction of pharmaceuticals, a failure of life support systems that result in injuries and death to patients and others. In addition, the hospital building is unusable for the duration of the emergency.



Three types of injuries can be identified in this hypothetical situation: (1) injuries and death to patients, employees and guests directly resulting from uncorrected earthquake hazards; (2) injuries and death to patients, guests and employees in the building indirectly caused by the earthquake and attendant hazards; and (3) injuries and death to members of the public otherwise unconnected with the hospital caused by the unavailability of the hospital's medical services for the duration of the earthquake emergency.

For the first type of harm, the only issue is whether the hazard that caused the injury or death was negligent, i.e., whether there were reasonable precautions available to the hospital to minimize the earthquake hazard. Statutory and regulatory standards as well as the customary practices of other hospitals in similar localities may aid in resolving this issue. Further, neither the *act of God* defense nor the existence of any negligence disclaimers in the contract between the hospital and its patients would appear to be effective in avoiding liability if the hospital's performance is substandard.

In analyzing the second class of injuries, one may utilize a *contract* analysis or a tort analysis. Under the former, the first question is whether the hospital has made an implied promise to provide continuing medical services to patients it has accepted, and if it has, whether the hospital has used skill and diligence and *good faith* to render the services under these circumstances. Whether skilled diligence and good faith could have avoided the injuries or death appears to fall again on the issue of whether the causes of the injuries or death are *unforeseeable*. In the hypothetical situation, the policy making body of the hospital is aware that earthquakes are a distinct possibility. Therefore, the pivotal question is whether the dysfunctions could have been anticipated and reasonably avoided.

The foregoing *contract* analysis apparently dovetails into the more traditional tort analysis. Normally a defendant (in this situation the hospital) does not have an affirmative duty to render medical services. However, two important exceptions (noted above) seem pertinent. The hospital and the patient have apparently established a *special relationship* between themselves, and the hospital has apparently undertaken a series of medical procedures as an integral part of that *special relationship*. Under those circumstances, it seems reasonably clear that a hospital has an *affirmative duty* to provide continuing medical services to its patients. The service rendered under this *affirmative duty* need not be perfect but only must conform to "that reasonable degree of skill, knowledge and care ordinarily possessed and exercised by (professionals) under similar circumstances." The analysis again focuses on whether the initial failure to prevent the dysfunctions from occurring was itself negligent. Therefore, if the hospital is responsible for the initial injuries or deaths occurring to patients resulting from dysfunctions in the

hospital's use, the hospital would also be liable for the consequential injuries and damages to other patients.

In analyzing the third type of injuries, consequential harm to visitors and employees is not subject to the same affirmative duty or contract analysis which would impose liability on the hospital for its patients. It is fairly clear that a medical professional is not required under normal circumstances to render medical assistance to *strangers*. It is unclear whether the existence of the employer/employee relationship between the hospital and its medical staff or the landowner/invitee/guest relationship between the hospital and third party visitors to the hospital abrogate that general rule of non-liability.

It is also unclear whether the hospital is liable for harm to the general public caused by the lack of medical attention which might otherwise have been provided by a functioning medical facility. It may be argued that the general public has a *reasonable expectation* that the hospital continue to provide medical services during an emergency. Whether that expectation has been met under the specific facts of the hypothetical situation probably rests on whether the initial failure to take precautions to prevent the initial dysfunction was in itself *negligent*. If so, the pivotal question is then whether the harm suffered by these third parties is reasonably *foreseeable*.

ABAG's survey sample of company officials and design professionals did not reach a majority viewpoint on the hospital's potential liability in this situation.

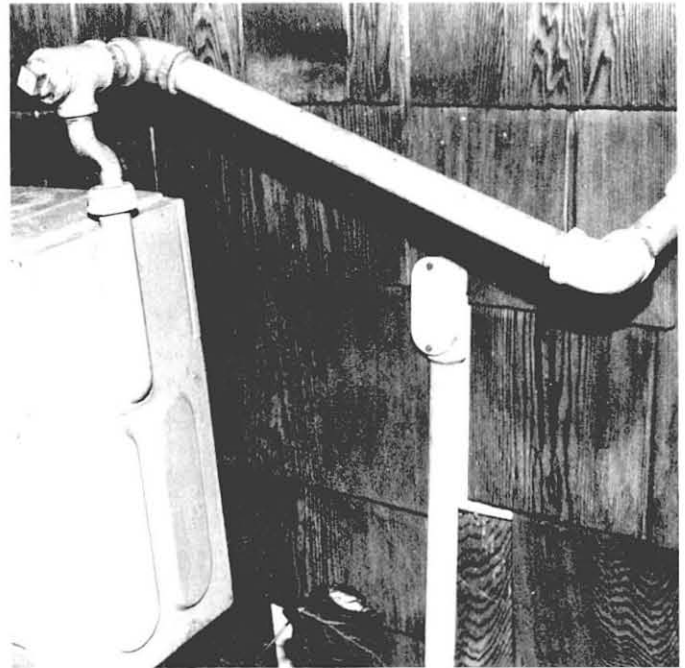
VI. Hypothetical Situation F: Private Natural Gas Utility Company

The private utility company providing natural gas discovers, through a study, that, in a moderate-to-large earthquake, its emergency back-up systems would not be adequate to ensure continuing provision of natural gas for residential heating. The utility takes no effective steps to improve its emergency systems, and in the subsequent earthquake the system fails during the winter, leading to the loss of life of some elderly, infirm and infants, and severe hardships for all affected users.

The first issue is whether the gas company's failure to take effective steps to improve its emergency systems is negligent. Under the safety incentive analysis, do the advantages of continued services outweigh the cost of developing the improved back-up systems? Statutory and regulatory standards, custom and practice in the industry and expert witnesses regarding the effectiveness of the alternative systems are examples of evidence which may be pertinent. If the installation of the back-up systems is not required under the *reasonable person* analysis, then there is no negligence at the onset and the gas company would not be liable.

The *act of God* defense may be available insofar as public utilities have not been held liable for interruptions immediately resulting from natural phenomena such as hurricanes and lightning strikes.

ABAG's survey of company officials and design professionals did not reveal any consensus on the liability of a utility company in this situation.



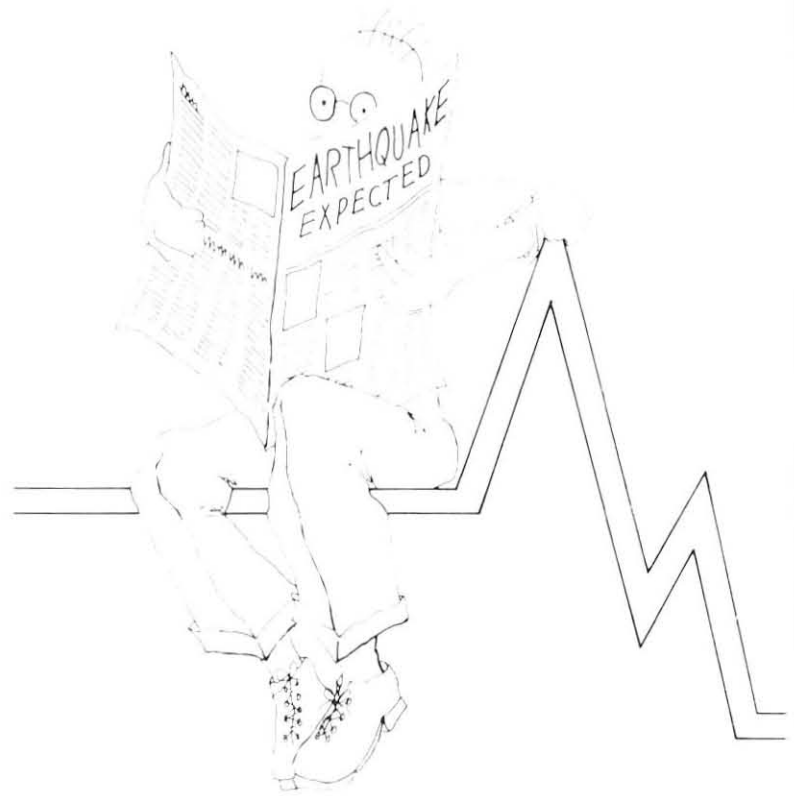
VII. Hypothetical Situation G: Governmental Earthquake Watch

A government agency issues a watch that the chance of an earthquake in the area has increased from 1 percent per year to 20 percent per year. The State Office of Emergency Services advises people and companies that they should prepare for a possible earthquake, and should take steps necessary for self-sufficiency for three days. The company does nothing. A major earthquake occurs and traps employees and visitors for three days. Injuries and illnesses are aggravated, there is extreme distress, and some deaths result from inadequate first aid supplies, food and water.

In this hypothetical situation, the employees and visitors may have been prevented from leaving the building either by conditions within the building or outside the building. If the former is true, and the cause of the conditions which trapped the employees and visitors can be attributed to negligence on the part of the company, then the company is probably liable for the injuries and deaths described. This would be true regardless of whether the earthquake prediction had been made and the advisory warning given.

However, if conditions within the building prevent employees and visitors from leaving but such conditions are not attributable to any negligence on the part of the company, or conditions outside the building prevent employees and visitors from leaving, the company is liable only if there is an *affirmative duty* to provide self-sufficiency.

As noted in the discussion of Hypothetical Situation A, even though the company may have non-negligently caused visitors and employees to be trapped in the building, it is probably under an affirmative duty to take reasonable steps to minimize the danger. Whether the precautionary step of arranging for self-sufficiency was a necessary and reasonable step is an issue to be decided at trial. The earthquake prediction and the advisory warning would be submitted as evidence that this was a reasonable and appropriate step for the company to take. Moreover, as noted previously, the widespread dissemination of some emergency preparedness measures and earthquake hazard knowledge is also evidence of its *reasonableness*.



In all other circumstances, the affirmative duty of the company must be based in part on the relationship between it and the people who are trapped. It is unclear whether the employer/employee or the owner/guest relationship is sufficiently *special* to impose an affirmative duty. However, the warning and advisory statement from the State Office of Emergency Services is evidence supporting the existence of an affirmative duty. Whether such evidence is sufficient is unclear under the present law. Moreover, if the defendants' continued presence in the building is not necessitated by the circumstances but is in part a voluntary decision to stay inside the building rather than risk hazards outside the building, then their claims to an affirmative duty on the part of the company are weakened.

Finally, potential employer tort claims are replaced by the worker compensation system granting them limited recovery for injuries "arising out of the employment."

ABAG's survey sample of company officials and design professionals did not reach consensus on the liability of the company in these circumstances.

VIII. Hypothetical Situation H: Movie Theater

A movie theater is located in an area of known seismic risk. The number and location of emergency exits conform to local fire and panic codes. An earthquake occurs and half of the exits are blocked due to falling parapets and marquees. People panic and some people are crushed by the frantic occupants while attempting to leave the building.

The first issue is whether the movie theater owners are negligent in tolerating a condition where half of the emergency exits can be blocked by falling parapets and marquees in an area of known seismic risk. So long as there is a sufficiently *foreseeable* earthquake risk, it appears that the conditions described would justify further analysis by a jury on the basis of the appropriate evidence, for example, standards and customs in the trade and expert testimony.

The defendant's compliance with the local fire and panic codes is not evidence of non-negligence. The code is not designed to address the hazards giving rise to the injuries described. The design, location and number of emergency exits are intended to lessen the hazards associated with a fire and a panicked group of people but not necessarily those associated with the blockage of the passages by an earthquake.

Assuming that the failure to mitigate the possibility of the parapets and marquees blocking emergency exits constitutes negligence on the part of the theater owners, the final critical concern is whether such negligence caused the actual injuries. Arguably, actions of the panicked fellow theater goers caused the injury or the victim's own panicked behavior absolves the theater owners from liability.

The second issue is that of the theater goers' possible negligence. Under California law, the standard of care which a reasonable person must take in an *emergency situation* is significantly less stringent than that imposed in nonemergency situations. If, even under this less stringent standard, a particular individual is found to have been negligent during the emergency, that person may still recover for injuries to himself or herself in those jurisdictions where the absolute defense of contributory



Photo courtesy of H. J. Degenkolb Associates, Engineers

negligence has been abrogated. However, in such jurisdictions the size of the damages to be awarded will be lowered by the comparative negligence rule.

If the panicked behavior of a theater goer injures someone other than himself or herself, and that conduct would not have occurred but for the original negligence of the theater owner, the negligence of the theater owner still can be said to have *proximately caused* the injuries complained of and the owner would be liable. Even in the instance where the actions of the panicked theater goers are found to be negligent, that only imposes joint liability for the injuries on the fellow theater goer and the theater owner. It does not absolve the theater owner of liability altogether. In cases of joint liability, one of the tortfeasors may be required to pay all the damages but is then legally permitted to seek partial compensation from the other tortfeasor.

IX. Hypothetical Situation I: On-Site Storage of Hazardous Material

Several electronics companies have on-site storage of hazardous materials, including solvents and acid plating solutions. The storage conforms to all pertinent State and local regulations. However, these standards do not require secondary containment facilities or above ground containers. Earthquake resistant design is specified in the Uniform Building Code. A major earthquake occurs, some storage vessels rupture and many pipelines and pipe-vessel connections fail. The materials contaminate the air, as well as leak into storm drains, sewers and the ground. Illnesses, fishkills, and sewage treatment disruption occur due to the air and water pollution. Two months later, water supply agency monitors determine that their ground water resources have been contaminated for an indefinite period.

First, can the electronics companies be held liable under the theory of negligence? Mere compliance with the State and local regulations does not act as a shield to liability. If the companies have complied with the Uniform Building Code, that too does not provide a shield to liability. Moreover, the standard of behavior applicable to the electronics companies may well be higher than the normal *reasonable person* standard. Where the harm that might

be caused is as pervasive and as far-reaching as that presented here, the courts might conclude that a defendant is under an obligation of the "highest care and diligence." Under such a standard, it is much more likely that the companies would be found negligent.

There is also the possibility that the companies' activities in storing hazardous materials is an *ultrahazardous activity* which would impose strict liability for any harm resulting from such activity. The Federal Fifth Circuit Court and the Louisiana Supreme Court have recently decided that storage and disposal of hazardous wastes are ultrahazardous activities. Assume that in the hypothetical situation the applicable legal rule is that storage of hazardous materials constitutes an *ultrahazardous activity*. The critical question then is whether the injuries resulted from mere storage of the hazardous material. If the storage techniques used were vulnerable only in the event of an earthquake but not in any other more common natural phenomena, then arguably the injuries did not result from the storage of the hazardous materials, but from the earthquake. Under these circumstances there may be no liability under the *ultrahazardous activity* rule.

The final issue is the precise harm for which damages may be recovered. Clearly, the illnesses and fishkills in private waters would be compensable. However, disruptions to sewer services and contamination of the ground waters would constitute public nuisances and, as such, the only remedies under California law are an action for injunction or abatement of the nuisance. Neither the public entity bringing that action nor a private individual can recover damages.



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X. Hypothetical Situation J: Manufactured Housing

A company manufactures pre-fabricated housing. It distributes 90 percent of its product to areas of known seismic risk. The houses are constructed to applicable code standards and located on permanent foundations in an area of Bay fill. The developer hires a private contractor to construct standard pier foundations and to attach the home sections to each other and to the foundations. A moderate-to-large earthquake results in severe differential settling and violent shaking that causes the home sections to become detached from each other and from the foundations, making the homes uninhabitable. Is the manufacturer strictly liable?

There is the possibility of negligence on the part of one or more of the following: the manufacturer; the developer; and the private contractor.

The manufacturer may have been negligent in not designing the pre-fabricated housing to withstand the level of risk inherent in its market area. Moreover, the manufacturer may have also been negligent in failing to warn its buyers and instruct them as to the appropriate measures to be taken in such areas.

Second, the developer may have been negligent either in purchasing a product which is not appropriate for an area of high seismic risk or in failing to make appropriate arrangements for securing that product to a foundation. It should also be noted that under California law, the developer is also liable for the negligence of the private contractor.

Third, the contractor may have been negligent in failing to provide earthquake-resistant foundations for the pre-fabricated housing.

As noted above, there is generally a rule of strict liability applicable to defective products. Under California law, mass-produced, standardized homes developed by large-scale developers constitute a *product* subject to the strict products liability standard. Under Hawaii law, pre-fabricated housing has been directly held to be a *product* for strict product liability purposes. Given the manner in which pre-fabricated housing is manufactured, distributed and utilized, California courts almost certainly would find that pre-fabricated housing is a *product* for strict products liability purposes. Other jurisdictions employing the strict products liability rule would probably follow suit.



If the strict liability standard is applicable, the plaintiff must prove a *defect* in order to recover.

There are two potential defects in the pre-fabricated house: (1) the house is defectively designed in that it is too susceptible to being detached from the foundation; or (2) it is defective in that it was placed on the kind of foundation set forth in the hypothetical situation. Under California law, a product is defective in design only if the risk in that design exceeds the benefits, or the product fails to conform to *ordinary consumer expectations*. Once the plaintiff proves some *risk* in the product's design, the burden of establishing that the benefits outweigh the risks shifts to the defendant. Moreover, the risk/benefit test may be applied from a position of hindsight, utilizing information that may not have been available at the time of the product's original sale. The standards established by the *consumer expectation* portion of the design defect standard is very unclear.

Despite the fact that the pre-fabricated housing may become defective only after being placed on its foundations and after the product leaves the manufacturer's hands, the manufacturer may still be held strictly liable for this defect under California law.

It should be noted that the damages suffered are largely economic. In strict liability cases, it is possible to recover such economic loss only if the product itself suffers physical damage resulting from the defect, or if that same defect poses a serious risk of harm to people. The economic harm suffered by the pre-fabricated housing in the hypothetical situation appears to fit under either of the two exceptions. Further, even if the standard to be applied in this instance is negligence rather than strict liability, there may be some basis under California law for establishing recovery for purely economic harm.

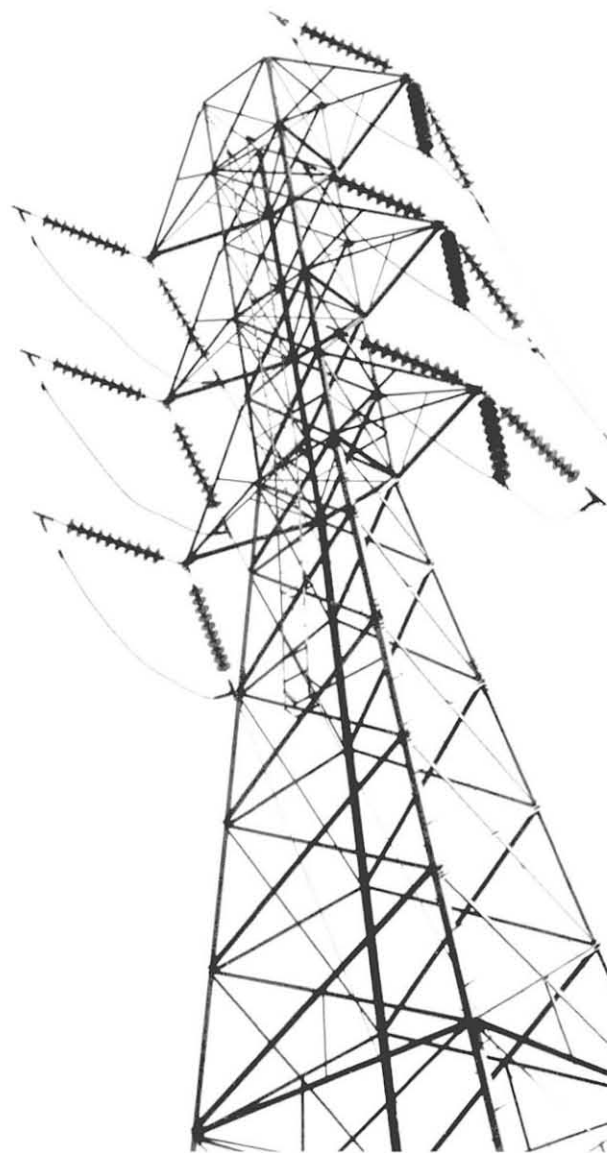
XI. Hypothetical Situation K: Electrical Transmission Line

An electrical power company transmission line falls during an earthquake. The earthquake also causes the shut-off unit in the substation to fail, and the line remains live. Injuries, death, and fire result from subsequent contact with the line.

Under California law, the supply of electrical power does not constitute an *ultrahazardous* activity and is therefore not subject to strict liability rules. However, under some circumstances, an electric power company may have an obligation to "use very great care to prevent injury to personal property." Whichever standard is appropriate, the company's actions and the circumstances surrounding the fall of the transmission line and the failure of the shut-off units should be reviewed by the jury.

Further, regardless of whether the presence of the live transmission line on the ground resulted from the company's negligence, the power company is probably under an *affirmative duty* to take reasonable measures to alleviate the dangerous situation once it arises, if it has notice of the facts. This duty arises from the general doctrine that a party creating a situation of peril (even non-negligently) is under an obligation to remedy the situation. The company's response, therefore, would be tested under a *reasonableness* standard.

The precise nature of the injuries and how they were caused, and the circumstances surrounding failure of the company to either take precautionary measures or to carry out its *affirmative duty* will determine the extent to which the company is liable for the resulting damages. It should be noted, however, that under California law the contributory negligence of a victim does not bar recovery but only reduces the size of their recovery.





PART D:

Approaches for Using Liability to Promote Safety

The preceding analysis of liability and its impacts serves as a basis for identifying several approaches for increasing the effectiveness of tort liability in encouraging implementation of earthquake safety measures. These approaches focus on education, legislation, and insurance. Based on an extensive evaluation, ABAG staff has instituted two major courses of action:

- educating the private sector regarding earthquake liability (in part through the publication of this report); and
- working to establish a legal basis for immunizing design professionals, building owners and developers from tort liability for retrofitting buildings and structures to locally established life-safety standards.

The basis for this evaluation is described in the following sections.

I. Appropriateness of Tort Liability for Earthquake Hazards

As stated in the introduction, negligent tort liability has its roots in English common law, where it may have developed to achieve fairness on an individual basis. Although the underlying motives are not clear, they may have included compensation of the victim, punishment of the person who committed the tort, and abstract concepts of equity. By the Twentieth Century, tort law was seized upon as a means of promoting safety. This use of tort law is not necessarily incompatible with other statements of tort law's purpose.

This research on liability theory was supplemented with survey and interview data on the appropriateness of tort liability for earthquake hazards.

More than half of the design professionals surveyed thought that a design professional should be held liable if

The issue of “who is liable” can become “who can best pay” when a liability case goes before a jury.

JOHN LARSON

*Former Los Angeles County Counsel
Musick, Peeler, and Garrett*

his negligent failure to advise a client to initiate corrective or preventive measures causes or makes more likely the loss of life or property damage resulting from earthquake hazards. More than one-third felt that such liability should depend on the situation, while only 8% felt that they should not be held liable.

Approximately two-fifths of the company officials surveyed thought that a company should be held liable if its negligent failure to initiate corrective measures causes or makes more likely the loss of life or property damage resulting from earthquake hazards. About half felt that such liability should depend on the situation, while only 7% felt that companies should not be held liable. The company officials interviewed gave similar responses.

In the interviews, officials indicated that they believed liability should exist because they would not want to work for an irresponsible company, liability was consistent with the moral obligations of companies, and liability was consistent with the legal concepts of *reasonableness* and *standard of care*. Situations where liability should exist would depend on the cost of mitigation, the size and *foreseeability* of the earthquake, and the standard of care established. Those who believed that liability should not exist believed that earthquakes were clearly an *act of God*.

Thus, both legal theory and the perceptions of those affected supports the notion that liability is an appropriate tool for promoting earthquake safety.

II. Survey and Interview Results

In an attempt to determine support for and reaction to possible changes in liability rules, the design professionals and company officials surveyed and interviewed were asked a series of questions.

If, by statute, design professionals were explicitly declared liable for their failure, negligent or intentional, to advise a client to take actions to reduce hazards, three-fourths of those surveyed felt that they would do more to reduce hazards than they are doing now. Similarly, seven-eighths of the company officials surveyed believed that if companies were declared liable for their failure to take such actions, they would do more.

Design professionals, when asked which course of action would be most effective in reducing earthquake hazards, believed some degree of liability and immunity for design professionals as currently exists would be most *effective*, rather than making such professionals more liable or more immune. Similarly, three-fifths of these professionals were *not personally in favor* of increasing liability of design professionals. On the other hand, more than two-fifths of the company officials surveyed felt that making companies more liable than now would be an *effective* action to reduce earthquake hazards. Close to two-thirds *personally favored* increased liability for companies as a means to encourage them to reduce risks from earthquake hazards, if only in some instances.

More than two-thirds of the design professionals were in favor of a state-mandated program requiring private sector improvement of dangerous facilities which allows a grace period of immunity before the owner becomes subject to potential liability. Only two-fifths of the company officials surveyed favored such a program, although one-third indicated that they might or might not favor it.

On the other hand, most company officials interviewed believed that companies *should not* be made more liable or more immune. They believed other courses of action would be more effective.

Courses of Action Recommended by Company Officials to Encourage Earthquake Safety

1. Educate company officials about their liability.
 2. Educate company officials on effective and economical ways to prepare for an earthquake.
 3. Institute government regulations to mitigate unreasonable hazards, including retrofitting older tilt-up concrete buildings, unreinforced masonry buildings, and mobile home foundations; and fastening mechanical and electrical equipment, utilities and furnishings.
 4. Use the carrot of safety, rather than the stick of liability.
 5. Use financial incentives to promote emergency preparedness.
 6. Work with insurance companies and business and professional organizations.
 7. Work for better cooperation and understanding between the business community and local or state government in disaster preparedness.
 8. Work with the news media to promote continued awareness of earthquake hazards.
-

III. Possible Approaches Identified for Promoting Safety

No clear consensus exists for making companies or design professionals either more liable or more immune to promote safety. However, several possible approaches for encouraging hazard reduction use liability indirectly. These approaches were extensively discussed at review committee meetings.

A. Educational Approaches

Educating officials on liability rules would increase the effectiveness of those rules by promoting concern for the legal and economic ramifications of failing to reduce hazards.

Education on hazards identification would improve the ability of officials to make the rational cost-benefit analysis essential to one basis for improving negligence liability.

B. Legislative Approaches

Introducing legislation to clarify the weakness of an *act of God* defense (or even publicizing this weakness) would reduce the perceived uncertainty of the liability rules. However, ABAG staff in its surveys and interviews of company officials could find no indication that either perceived uncertainty in the liability rules or perceived degree of liability have any relationship to the existence of exemplary earthquake preparedness in companies.

The law could be changed to provide that a defendant's compliance with certain types of comprehensive governmental regulations serves as a complete defense to a claim that the defendant was negligent relative to a matter directly dealt with by those regulations. Such a *standard of care* could be set for a general procedure, such as independent review, or introduced as part of particular statutes or regulations, such as might be developed for retrofitting existing buildings. Establishing such a defense would reduce the uncertainty of the rules. However, this approach may encourage a *cookbook* approach to design when engineering judgment is required.

C. Insurance Approaches

In theory, ways could be developed to use the insurance system to encourage hazard mitigation. An example of one such technique would be to price the initial block of insurance so high that partial self-insurance or high deductibles are encouraged. Another example would be to base premiums on past performance, thus lowering premiums as companies reduce hazardous conditions. Such proposals would be extremely difficult to implement. The potential financial savings to companies are also so small that it is unlikely that they would be a major incentive.

If we ever had a major earthquake of the size predicted for California . . . the current court judicial system could not physically handle the number of potential damage suits.

Anonymous Company Official Surveyed

IV. Workshop Findings

ABAG conducted an earthquake liability workshop in San Francisco on Friday, April 13, 1984. The attendees represented a cross section of private sector businesses, design professions and federal, state and local governments. During the morning, speakers with legal and technical expertise reviewed the current state of engineering and architectural knowledge regarding earthquakes and the possible legal bases for liability for earthquake related inquiries and damage. The afternoon session consisted of concentrated discussions in smaller groups of the information presented and means of encouraging earthquake safety.

The participants were pleased with the morning session. They viewed it as informative and an example of the kind of liability education needed by design professionals, company officials, and governmental staff and elected officials.

The advantages and disadvantages of regulations and liability were the subject of comments in the morning and extensive discussion in some afternoon sessions. The importance of sophisticated engineering judgment and *state-of-the-art* design for new construction was emphasized. This type of judgment is difficult to incorporate into a code standard when those codes can be treated as a *cookbook*. Yet, it is precisely this type of process that can be evaluated by the liability system.

On the other hand, there are a tremendous number of existing buildings that are not safe. Ways to encourage rehabilitation, if only to a *life-safety* standard, are needed. Partial rehabilitation may also be the only kind of cost-effective measure feasible. Thus, many felt that immunity from liability for undertaking such rehabilitation should be given to private industry and design professionals. The rationale for the recommendation was not to motivate private industry to take such measures, but a sense of fairness. Most believed that thoughtful and sincere attempts to correct problems ought to be rewarded.

Several recommendations also emerged which did not involve liability. Such suggestions included tax or other financial incentives to private businesses for undertaking earthquake hazard mitigation, creating a statewide reserve for catastrophic earthquake losses, funding governmental loan programs to rehabilitate buildings and devising better technical standards for earthquake mitigation measures. In addition, education of building owners, private industries and design professionals on what constitutes earthquake hazards and reasonable steps to mitigate those hazards was mentioned as a first step.

We have a choice. We can have our elected officials in Sacramento approach the issue beforehand in a rational manner subject to public review and debate, or the seven members of the California Supreme Court may decide the manner for us using 20-20 hindsight.

JOHN LARSON
Former Los Angeles County Counsel
Musick, Peeler, and Garrett



All too easily the federal government changes from “big brother” to “sugar daddy” when businesses want low interest loans after a disaster.

JOHN SCHEIBER
*Federal Emergency Management
Agency Attorney*

I suggest that we have to be careful when pushing for legislative changes to the law of negligence, including a grant of immunity to a class of property owners.

BRUCE OLIVER
*Attorney for Kaiser Aluminum
and Chemical Corporation*

V. Implementation of Strategies

After the workshop, ABAG staff and the review committee met and discussed implementation of some strategies to reduce earthquake hazards. ABAG staff recommended two strategies.

The Committee concurred in their recommendations. ABAG staff has actively undertaken both steps. Further, it was suggested that the staff explore the possibility of funding for a study of creative financial incentives for earthquake mitigation both as to financing methods (tax incentives and loans, for example) and funding sources to supplement the role of tort liability in this area.

Some of our elected officials believe in “Structural Darwinism,” that is, that there is no need to do anything about bad buildings because the earthquake will get rid of the unfit buildings.

Anonymous Local Government Staff Member

Recommendations

EDUCATION — The results of this study should be disseminated widely to alert the private sector to the problem of earthquake liability and the availability of hazard mitigation measures.

LEGISLATION — Legislation should be introduced at the State level to immunize building owners and private industry from tort liability if they undertake rehabilitation of existing structures to *life-safety* standards established by local governments.

What Can Businesses Do?

Liability is a tool to encourage earthquake-related safety measures. The types of precautions that can be taken are varied.

For geologic concerns:

- ✓ Check for possible problems—not only for new construction—but prior to facility or site acquisition. (Acceptance of a geotechnical report can be a condition of purchase.)
- ✓ Know sources of geologic hazard information.
 - local city/county files and *General Plans*
 - California Division of Mines and Geology
 - U.S. Geological Survey
 - Southern California Earthquake Preparedness Project (SCEPP) in Van Nuys, California
 - ABAG
- ✓ If in doubt, hire a professional!

For structural engineering concerns:

- ✓ Structural engineers and architects should be allowed to participate from the beginning on major new projects.
- ✓ Excessive remodeling can change the way a building responds to an earthquake.
- ✓ Regularly inspect existing facilities and have plans for reconstruction/rehabilitation.
- ✓ Check new facilities prior to acquisition.
- ✓ If in doubt, hire a professional!

For emergency response planning:

- ✓ Many non-structural problems can be dealt with rather easily. Check SCEPP's publication, *Reducing the Risks of Nonstructural Earthquake Damage: A Practical Guide*.
- ✓ Walk through your facilities and look for problems.
- ✓ Assess on-site emergency medical capabilities.
- ✓ Have operating plans for evacuation (including multiple access/egress routes) and fire control and practice them.
- ✓ Have plans (and back-ups) for communication.
- ✓ Have emergency power and water back-ups.
- ✓ Have redundancy in data or record storage and processing, including off-site storage and back-ups of essential records.
- ✓ Know sources of information.
 - County (or City) Office of Emergency Services
 - State Office of Emergency Services
 - local Fire Departments*
 - local Red Cross
 - your insurance company
- ✓ If in doubt, hire a professional!



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