AC 2007-1436: ENGINEERING MALPRACTICE: AVOIDING LIABILITY THROUGH EDUCATION

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Engineering Malpractice: Avoiding Liability through Education

Introduction

Not many engineers consider malpractice when they receive their engineering degrees or, for that matter, give it much thought during their employment. Most degreed engineers are not licensed and, even if licensed, are largely insulated from liability simply because plaintiffs typically choose to sue the employer rather than the employee engineer. Unfortunately, as the engineering profession migrates to smaller companies, solo consultants, and independent contractor relationships the specter of legal liability looms larger. Engineering malpractice, therefore, will increasingly become a concern of those now entering the practice of engineering, as well as of those who find themselves employed in smaller companies or as an independent contractor in larger ones.

In this paper, we will discuss the elements of engineering malpractice against engineers and present real cases of engineering malpractice. Also, we will discuss how our Legal Studies in Engineering program raises the awareness of our students to their legal responsibilities to their employers and to society. We will present short course modules that can be used in all levels of engineering courses to illustrate how engineering practice and our legal system interact.

Concept of Negligence

The concept of negligence is broad and vague in common usage, but its legal definition is fairly straightforward: negligent behavior is that which a reasonably prudent person in the same or similar circumstances would not have undertaken. By definition, no one intends to be negligent because everyone strives to be reasonably prudent. So then, why does negligence occur, and why does it occur as often as it does?[1] Clearly, we should expect humans to make mistakes, and, by extension, we should expect engineers to make mistakes in their professional lives. [2]

Engineering malpractice is directly related to the more generic legal liability that results from negligent conduct. So an understanding of negligence is a key to understanding malpractice.

The elements that a plaintiff must prove in a negligence lawsuit are:

1) the defendant owed the plaintiff a duty of reasonable care;
2) the defendant breached that duty (in other words, the defendant engaged in negligent behavior);
3) the plaintiff sustained injuries;
4) those injuries were the direct, natural and proximate cause of the defendant's negligent act or omission.[3]

Each of us owes a duty of reasonable care to foreseeable parties (those persons who are likely to be affected by our conduct in a particular circumstance), and each of us must act as a reasonable person under similar circumstances.[4] The reasonable person standard is meant to impose a duty on all to exercise the care, knowledge and judgment that society requires its members to use for the protection of the rest of the community.[5] The reasonable person is purely hypothetical; this person does not possess all knowledge in a particular community, but, rather, has the average knowledge of a community.[6] Our

jurisprudence requires that the judge in the dispute determine whether the defendant owed the plaintiff a duty. That is, the judge determines as a matter of law what the required standard of care is for a particular person.[7]

Once the duty of an individual has been determined by the judge, deciding whether a breach occurred is relatively straightforward. When a person fails to exercise reasonable care, that person has breached the duty of care and is negligent. The jury is charged with determining the facts surrounding the case, and deciding whether the duty of care was breached.[8] However, unless the other elements of a negligence cause of action are proven (see the list of elements from above) the negligence does not equate to legal liability. In other words, if a person breaches a duty of care, that person is negligent, but not necessarily liable for that negligence.

The third element of negligence, whether the plaintiff sustained injuries, is also a relatively straightforward determination. However, the type of injuries suffered is critical. Personal injuries are always compensated, but economic injuries are typically not. Economic injuries are accounted for under a contract theory, but not accounted for under a negligence theory. Courts have determined that allowing recovery of economic damages in negligence would allow for open-ended recovery. Based on public policy, courts have determined that this would prove to be too much liability for plaintiffs.

Proximate cause of the injury by the negligent party's conduct is the fourth and most difficult of the elements of negligence. Proximate cause must satisfy two criteria. First, proximate cause requires that the negligent party's act is a substantial factor in the cause of the person's injuries and second, there is no other public policy rationale to not impose liability.[9] The court can determine that it is unfair to impose liability on the plaintiff even if the substantial factor element requires it.[10] This situation occurs when the chain of effects that connects the defendant's negligent acts to the plaintiff's injury is so remote that imposing liability on the defendant would be inherently unfair. (Consider, for example, a Rube Goldberg series of events that lead to a plaintiff's injury.) Typically, the test of foreseeabilty of the harm caused is used. That is if the defendant foresaw or should have foreseen the harm done by his conduct, the negligent act is foreseeable and is a proximate cause of the plaintiff's injury.[11]

Engineering Malpractice

Now that the basics of the general negligence cause of action has been outlined, we can turn our attention to the concepts of engineering malpractice. Engineering malpractice liability is a subset of professional liability obviously directed towards engineers. Engineering malpractice uses the same concepts of negligence to determine liability. Specifically, if an engineer is negligent, and this negligent conduct is the proximate cause of the injuries, then the engineer is liable for engineering malpractice.[12] The standard of care is that "normally possessed by members of [the] profession . . . in good standing."[13] A higher standard applies if the engineer represents that he has greater or less skill or knowledge" than that normally possessed by members of the profession.[14]

Engineering Malpractice Examples

There are numerous examples of engineering malpractice in published court opinions. Many of these cases involve civil engineering practice as these engineering practitioners are typically licensed and in the public eye via public works projects. As an

example, consider the case of DOT v. Dupree. 256 Ga. App. 668 (2002). In this case, a pedestrian attempted to cross a busy highway at an intersection and was killed by a motorist. The design of the intersection failed to meet certain design standards involving motorist line of sight at the intersection. The accident occurred early on an overcast November evening, and the pedestrian was wearing dark clothing. The driver of the car never saw the pedestrian until striking her.

The plaintiffs demonstrated through evidence that the DOT committed design and engineering malpractice in a widening project by not installing traffic control devices at the intersection, by having too wide an intersection for pedestrian crossing within the sight distance, and in allowing uninterrupted vehicle approach speeds of 45 mph. Additionally, numerous accidents had occurred at the intersection after a widening project:

> Hill, a civil engineer with highway design expertise, testified for the plaintiffs that he had studied the intersection from 1978 to 1996; that historically there had been numerous collisions there after the widening; that increasing the lanes to five without a traffic control device doubled the risk of collisions because of the deficient sight distance; that under the standard of engineering care in 1986, DOT should have included a traffic control device in the design for the Widening Project; and that DOT departed from the engineering standard of care in design and planning in not requiring and including a traffic control device at this intersection in 1986 with the deficient sight distance and the uninterrupted speed of 45 mph. With the widening and with the deficient sight distance, motorists approaching the intersection at 45 mph could not stop before reaching the intersection for traffic or for crossing pedestrians, which increased the dangerousness of the intersection in deviation from generally accepted engineering design standards. The traffic studies after 1986 showing collisions confirmed that it was negligent not to require a traffic control device in the 1986 plans with the deficient sight distance and speeds of 45 mph. He also testified that widening without a traffic control also increased speed from either direction where the nearest traffic control device was over a mile in either direction and that there should be a sight distance of 550 feet for speed of 45 mph to allow safe stopping at the intersection. But, as designed, this intersection had a sight distance of only 250 to 320 feet to the north, which added to the danger without a traffic control device. This deficient sight distance also deviated from the generally accepted engineering design standards in effect in 1986. A pedestrian would cross at the average walking speed of four feet per second and would take thirteen seconds to cross the highway at the intersection. The uninterrupted motorist speed of 45 mph, the deficient sight distance, the width of 62 feet, and the absence of a traffic signal all made this intersection dangerous for pedestrians, because it would take a vehicle at that speed only 14 to 15 seconds to reach the intersection from the extreme of the sight distance. Thus, in the 1986 design, DOT departed from the generally accepted engineering design standard of care regarding pedestrian crossing at the intersection. The subsequent engineering traffic studies corroborated this opinion that DOT had been negligent in 1986 in failing to require a traffic control device at the intersection as demonstrated by the many collisions.

DOT 256 Ga. App. at 677.

In DOT v. Dupree, the defendant was negligent because it did not follow "generally accepted design standards." However, not following design standards is not negligence per se so long as the engineer applied professional judgment not outside that of a reasonable engineer.

The professional judgment rule is illustrated by Westmount International Hotels, Inc. v. Sear-Brown Associates, P.C.[15] In this case, the defendant was accused of

engineering malpractice in a consultation with a hotel. The engineer recommended that a ballasted roof not be installed in the hotel as required by one of two rules in the New York construction code, but failed to recommend the course of action suggested by the second rule. It may have been the engineer's professional opinion that a ballasted roof should not be installed based on professional judgment and therefore consideration of the second construction rule should not be considered. There was no evidence presented that the engineer did not behave as a reasonable engineer in the same or similar circumstances. If an engineer makes a judgment based on professional judgment that is not outside that of a reasonable engineer, no malpractice liability can be imposed.

As a third example, consider the case of Herzog v. Town of Thompson.[16] The engineering consultant in this case relied on a faulty flow meter reading in calculating the capacity of a municipal sewage plant. The municipality then relied upon this calculation in authorizing a substantial capital expenditure to increase the capacity of a municipal sewage treatment plant. The taxpayers and property owners of the municipality, not the municipality itself, sued the consultant on a theory of engineering malpractice to recover the tax costs for unnecessarily expanding the facility. Although this case was not decided on the merits of the engineering malpractice suit, it illustrates how public policy sometimes influences the outcome of negligence cases. In New York, taxpayers do not have a cause of action against public officials or their agents for waste.[17] The public policy rationale behind this approach is that public officials should not have to second guess their decisions under threat of lawsuit from their constituents. Of course, there is a counter-rationale that this policy does not encourage sound decision making by municipal officials. While states can abrogate this public policy through statute, it's unlikely that any state would do so

Conclusion

Engineers are judged on the same standards of negligence that other professionals such as lawyers, doctors, and clerics are judged. The standard requires the determination how a reasonably prudent person with the same background as the engineer making the decision in the same circumstances would have acted.

The best prophylactic measure to engineering malpractice is education. To that end, courses in engineering law, aim to increase the legal knowledge of engineering practitioners.[18] These courses aim to provide engineers with sufficient background in the law to recognize when their professional duties lead them into conflict with the law. Of course, even if engineering practitioners fall within the standard of conduct requirement it is still possible for a plaintiff to bring suit against a defendant who is not liable. Maintaining non-negligent conduct will more likely lead to a speedy and less costly outcome.

Bibliography

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[1] Negligent behavior, although commonplace, often does not lead to any harm.

[2] An employer who is found legally liable could seek indemnification for the judgment from its employee. However, this is rarely done because it seldom makes economic sense to do so.

[3] See 3-11 Construction Law § 11.04, LexisNexis, 2006

[4] Restat 2d of Torts, § 283

[5] Restat 2d of Torts, § 283, cmt. a.
[6] Id.
[7] Restat 2d of Torts, § 328.
[8] Restat 2d of Torts, § 329.
[9] Restat 2d of Torts, § 431.
[10] Restat 2d of Torts, § 435
[11] 57A Am Jur 2d Negligence § 469
[12] Creative Inception, Inc. v. Andrews, 50 A.D.2d 553 (N.Y. App. Div. 1975)
[13] Restat 2d of Torts, § 299A.
[14] Id.
[15] Westmount International Hotels, Inc. v. Sear-Brown Associates, P.C., 65 N.Y.2d 618, 619 (N.Y. 1985)
[16] Herzog v. Town of Thompson, 216 A.D.2d 801 (N.Y. App. Div. 1995)
[17] Id. at 871.
[18] High, Martin S. and Paul. E. Rossler, "Legal Studies Curriculum for Technical Professionals," Proceedings of the 2005 American Society for Engineering Education Annual Conference & Exposition, Portland, OR.