

Forensic Specialists Are Sleuths

These engineers combine science and detective work

By Thomas Gaudio



Boyell's work starts when things fail.

MOST ENGINEERS ARE in the business of making things; Roger Boyell usually takes them apart. For the last 30 years he has used his training as an electrical engineer to help resolve lawsuits as a forensic engineer. A member of the National Academy of Forensic Engineers and a licensed engineer and private investigator in New Jersey, Boyell has consulted or given testimony in hundreds of cases. The Moorestown-based expert spoke about his investigations into mechanical failures and other incidents involving devices from power strips to scooters with **NJBIZ** Staff Writer Thomas Gaudio.

NJBIZ: What is a forensic engineer?

Boyell: First, an engineer is a professional who applies the knowledge and techniques of mathematics and science to real-world problems.

A forensic engineer can be from any specialty—electrical, mechanical, civil, chemical—but he devotes his activities to resolving matters in contention in the legal forum. The forensic engineer is trained and has experience in diagnosing what happened after the fact.

NJBIZ: What is a typical case?

Boyell: Several times lately I've had occasion to investigate electric shock in industrial settings. [One case involved] a manufacturer that was making some high-voltage equipment. In the course of making the equipment they have test procedures that an operator is supposed to go through to test it. There was a very earnest operator who was moving ahead with his test.

Unfortunately, he was working alone and was doing something not expected of him and he got his hand across high voltage and killed himself.

The questions were then asked: How did it happen? And, of course, who was responsible?

NJBIZ: What role did you play in that case?

Boyell: My job was to explain to the jury how it happened. The lawyer's job was to take my analysis and ascribe the fault.

What I found was that the employer did not recognize the hazard he created for the employee and the employee did not recognize the hazard because he was working around high voltage all the time.

NJBIZ: Who hired you?

Boyell: It was the plaintiff, the estate of the deceased worker.

NJBIZ: Are you hired mostly by the plaintiff or the defense?

Boyell: I'm about 50-50. Some medical experts typically are retained by only one side or the other. I try to work all sides. I claim that the evidence tells the tale. Whom I'm working for should not make a difference. Now, it's hard to not get personally involved with a case. You begin to either sympathize or non-sympathize with one party or another. It's hard to remain detached. Since you're hired by one side, frequently you must recognize that the continuation of your job depends on your finding in favor of that side.

NJBIZ: Then do you feel pressure to find evidence that favors your client?

Boyell: No, but if you find that the side you're working for is not going to benefit from your testimony, you've got to tell the client—usually the attorney—that "I'm sorry but my opinion is this and here's why." And in some cases, the attorney will say, "Gee, thank you very much, I'll go elsewhere." But usually with things in the physical world, there are objective tests [that will result in the same findings].

NJBIZ: Tests like what?

Boyell: In the case I mentioned, what was the voltage that the worker was exposed to? Well, you can go measure it. It's not a matter of opinion but of measurement. You know that 120 volts from the wall outlet is pretty dangerous. So if he got shocked by 600 volts, that's five times that number.

NJBIZ: Do most of the cases you're hired for go to trial?

Boyell: No, most don't. They get resolved partly, I hope, as a result of my analysis and partly because it's just easier to settle than go to court. There was a case for example, in which a worker had his hands cut off by a machine.

We found an electrical defect in the machine that may have contributed to it and there was a sizable settlement by an employer or an insurance company without the need for trial. This was because we found an electrical defect for which one of the parties would have been held responsible had it gone to court. It's nice if things do settle and everybody's happy.

NJBIZ: In the case of, say, a possible mechanical flaw, do you examine the equipment that failed and take it apart?

Boyell: Exactly. You go to the site, examine the equipment, take it apart, try to replicate the circumstances as much as possible. If it's an equipment failure, first of all you tell the peo-

ple to preserve the equipment in the shape that it's in: Don't use it, don't touch it, don't modify it. Frequently then an examination in which you replicate the circumstance will reveal the flaw.

His job is to explain to the jury how the equipment failure happened.

NJBIZ: How do you replicate the circumstances at the time of the incident?

Boyell: In the case of machinery or automatic doors or vehicles, you try to put them through the same operational steps that occurred at the time of the incident. For example, there was a battery-operated scooter-like device that a rider was using and he got thrown off. I was asked to determine how it occurred. What I found was a defect in the device that was, I believe, the manufacturer's error that has since been corrected. I was able to do it by simply

replicating the riding of the scooter in the manner that the claimant did until the defect occurred. It was fun!

NJBIZ: Were you thrown from the scooter?

Boyell: No. I was very careful. It did indeed fail, but I was prepared for the failure.

NJBIZ: How have the trends in the types of cases you've worked on changed?

Boyell: Twenty years ago there were a lot of cases involving traffic radar—people disputing the validity of traffic radar, frequently for good reason. Five or 10 years ago, the big thing was mobile phone site selection: Why do we need to have an antenna here? Why can't it be in someone else's backyard?

The current big rash of cases seems to be fires of apparent electric origin, typically from power strips, whether from their abuse or improperly designed power strips.

When you buy a cheap, plastic surge suppressor power strip, you're buying a potential hazard. ♦

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