

## Forensic engineers dissect disasters



### STRATEGY

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*Specialized firms try to reconstruct tragic events such as fires and car crashes to find out what went wrong and who, if anyone, was to blame.*

**L**ike most rubberneckers at a crash scene, Mark Hughes can't help wondering what caused the accident, what happened to the drivers and passengers involved and who, if anyone, was to blame.

But where most of us shiver and drive on, Mr. Hughes returns to the scene, bearing cameras, tape measures and an urgent desire to put the pieces of a disastrous puzzle together.

Mr. Hughes, 35, is founder and president of **Sintra Engineering** of Edmonton. Founded in 1997, the firm specializes in forensic engineering, the preparation of technical reports on accidents that can be used in court. Insurance adjusters top its client list, which includes lawyers representing insurance companies or individuals.

Young, aggressive and marketing-minded, Mr. Hughes challenges the conventional notion of forensic engineers, typically long-serving practitioners who moved into the field gradually and without a lot of fanfare. But he says his firm's approach is well-suited to work that demands increasingly specialized services.

"Just because somebody has a ton of experience, doesn't mean it's appropriate or applicable for the work that has to be done," Mr. Hughes says.

Using tools such as photographs, precise measurements and specialized computer software, Mr. Hughes and his colleagues try to reconstruct disasters, pinpointing what went wrong. Sintra competes with more seasoned players by emphasizing customer service and employee training.

Expertise with events such as car crashes and fires used to be gained primarily on the job, by fire and police crews who repeatedly witnessed the disasters. But training is becoming available, with some police forces conducting their own courses and others offered by specialized schools such as **Northwestern Traffic Institute** in Evanston, Ill., where Mr. Hughes headed in 1995 to hone his knowledge of car crashes.

Sintra's specialized approach seems to be working — Mr. Hughes says it is the largest firm of its kind in Alberta, with 13 engineers and working space of about 4,000 square feet. But the company is not alone in targeting the forensic services market.

"The [forensic engineering] business has



*Just because somebody has a ton of experience, doesn't mean it's appropriate or applicable for the work that has to be done," says Sintra founder Mark Hughes, taking photos of a crashed minivan, of the increasingly specialized forensic engineering field. JOHN ULAN/The Globe and Mail*

been around in Canada for 30 years, likely longer, but not officially," says Richard Kooren, chairman of the forensic engineering section of the **Canadian Society of Forensic Science** and vice-president of **Origin and Cause Inc.** of Ancaster, Ont., an engineering firm that specializes in fire investigations.

"It's now evolved into quite a wide array of expertise," he adds, with engineers specializing in fire, structural, geotechnical, environmental and electrical areas.

As investigations have become more complex, experts such as forensic engineers have become an integral part of the legal system, agrees J.J. Camp, a prominent Vancouver lawyer and partner in law firm **Camp Church & Associates** in Vancouver.

"The foremost change in the last 20 years is that lawsuits, particularly [civil] lawsuits, have become battles of experts, so that engineering and other forensic experts are needed. And sometimes they're heded on more than one issue."

That growing demand has proved bread and butter for **MacInnis Engineering Associates Ltd.**, a Richmond, B.C.-based consulting engineering firm known for its expertise in motor vehicle accidents.

Incorporated in 1982, MacInnis built its reputation on painstaking reports and ex-

tensive in-house research, including a raft of tests that helped it create what founding partner Duane MacInnis says is the world's largest database of low-speed crash tests.

MacInnis now sells that data to other, often competing, engineering firms, generating revenue and spreading its reputation at the same time.

The research is his company's "ace card," Mr. MacInnis says. "The research we do is expensive, exhausting, frustrating — but it allows us to turn out a better product. Ideally, there's a discernible difference between us and our competitors."

Engineers who provide forensic reports must be prepared to defend them in court, even though most cases do not go to trial. At firms such as Sintra and MacInnis, peer review systems are designed not just to spot technical flaws, but to prepare engineers for the grilling they can expect in court. Presentation skills are crucial, especially when a jury is involved.

"There is an element of teaching and theatre involved with a jury," Mr. MacInnis says. "You either play that game, or go home. If you're too dry and boring, the lawyers on the [other] side will draw that out to make sure that the jury's asleep."

This year, MacInnis is branching into fire

investigations, an area that Mr. MacInnis feels can benefit from the same kind of stringent, technical approach the firm brought to its automotive work. As well, it's moving into biomechanical engineering, the study of how the human body reacts to impact in, for example, a car crash.

The firm can likely count on demand for its new services. "[Lawyers] are tending to go to experts more frequently than they once did," says Don Brenner, a B.C. Supreme Court Justice since 1992 and formerly a lawyer specializing in aviation cases that frequently involved forensic engineering testimony.

Ideally, a case shouldn't be decided by experts, he says, noting that "there's always a concern about moving away from ordinary witnesses who were there, and saw what happened."

Although market demand may be driving a boom in forensic engineering, many practitioners have been hooked by the sheer variety of jobs encountered in the field.

"No two fires are the same," Mr. Kooren says. "They're always different, that's the challenge. You're always learning, not through courses, but by absorbing what you see and applying it to what you saw five years ago."