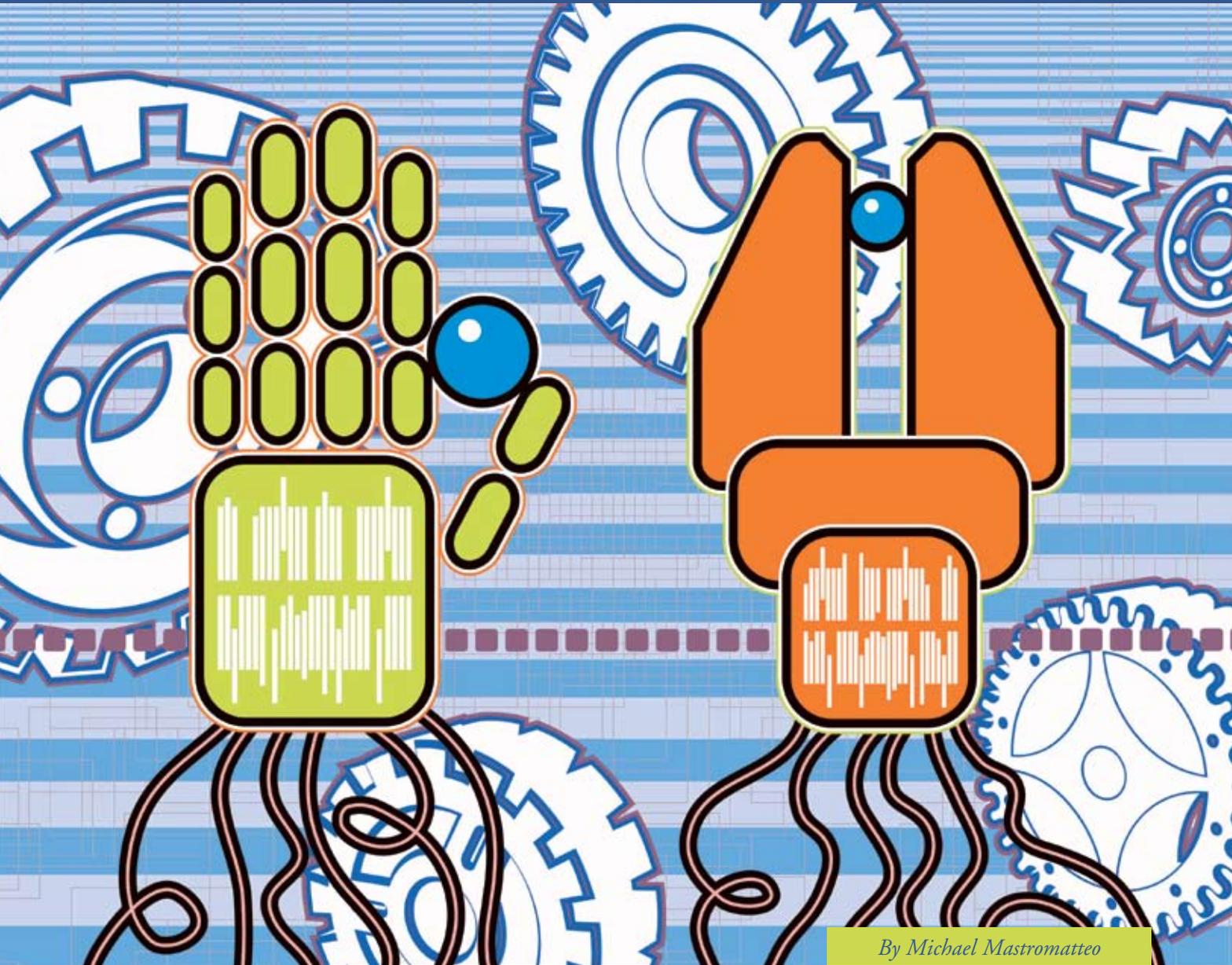


# *Forensic practice focus* OF UPCOMING GUIDELINE



*By Michael Mastromatteo*

PEO is producing a guideline it hopes will shed new light on the complex but dimly understood practice of forensic engineering. It's part of an ongoing effort to clarify the legal system's expectations for engineers giving evidence in court.



In keeping with PEO's imperative to develop guidelines and best practices for professional engineering practice, at its November 2010 meeting, PEO council authorized a subcommittee of the Professional Standards Committee (PSC) to move forward on preparing a guideline for professional engineers providing forensic engineering services.

The guideline is intended to enhance the general understanding of forensic engineering practice and provide a yardstick so that forensic engineering is carried out in a consistent and ethical manner.

### DEFINING FORENSIC ENGINEERING

What is forensic engineering?

In general terms, forensic engineering practice involves engineering analysis of mechanical or design failure. A forensic engineer might, for example, investigate what went wrong in a client's manufacturing process. Similarly, if a machine or device failed and had to be returned to the manufacturer, a forensic engineer might be called in to investigate what caused the failure.

The terms of reference for the upcoming PEO guideline describe forensic engineers as those who "apply engineering knowledge and skills to determine the cause of a destructive or unexpected outcome or event."

Indeed, forensic engineering has become an important tool for police, the Ontario Fire Marshal's office, the Ontario Ministry of Labour, legal professionals, insurance companies, delegated authorities—and ultimately engineers—in solving important public safety challenges.

In a 2007 article in *Engineering Dimensions*, for example, forensic engineer James Wilkinson, P.Eng., detailed how engineering analysis could be used to prevent racking system collapses (*Engineering Dimensions*, July/August 2007, p. 48). In outlining the events contributing to a specific rack collapse resulting in the death of a storage facility employee, Wilkinson called on regulatory authorities, academic and

research institutions, consulting engineering firms and manufacturers to "collectively develop the codes, standards and mandatory legislation to prevent a recurrence of these tragic, and preventable, workplace accidents."

Where traditional engineering emphasizes design skills, forensic engineering emphasizes deductive reasoning. Some, in fact, regard forensics as a special form of reverse engineering.

### GUIDELINE A CANADIAN FIRST

According to its terms of reference, the PEO guideline will describe best practices and procedures for identifying, analyzing and reporting on technological failures "in a manner that is consistent with the ethical and professional obligations of the practitioner."

Tentatively scheduled for release in July 2011, the guideline will cover specifying scopes of work for clients, clearly defining the problems under investigation, and the collection, documentation and retention of information during the course of an investigation. The guideline will also spell out the forensic practitioner's obligation to make clear to their clients any ethical and legal obligations of any item under investigation.

In recommending that the forensic engineering guideline be developed, the PSC considered a number of "public good" factors, including the number of discipline cases coming to light in this area, and the impact that forensic engineering practice exerts on the general public.

To date, PEO is the sole Canadian engineering regulator to undertake development of a forensic engineering guideline. In the United States, however, the National Society of Professional Engineers (NSPE) has joined forces with the National Academy of Forensic Engineers (NAFE) to develop a joint statement about forensic engineering.

Approved in 2006, the NSPE-NAFE statement describes forensic engineering as the application of art and science of engineering in matters related to jurisprudence. The statement acknowledges the role of forensic engineering in the protection

of public health, safety and welfare, but cautions forensic engineering practitioners to limit their service and advice to fields in which they have actual experience and knowledge.

The NSPE-NAFE statement also urges forensic engineers to be guided by the same codes of professional conduct as are all engineers in their particular disciplines and specializations.

### FORENSIC ENGINEERS AS EXPERT WITNESSES

While recent PEO discipline matters underscore the need for a common understanding of professional practice in this area, development of the PEO guideline is also a response to the concerns of some forensic practitioners about the wording in PEO's existing guideline, *The Professional Engineer as an Expert Witness*. Now undergoing revision, the expert witness guideline offers advice to engineers appearing in civil courts or tribunals—whether as expert or fact witnesses. Some forensic engineering practitioners have told PEO the existing guideline is skewed too heavily toward the client's expectations, rather than those of the legal system. Many of their concerns appear to focus not so much on the practice of forensic engineering, but on how engineers come across as expert witnesses when they present the results of their investigations in court.

Although there is some overlap between them, the practice of forensic engineers and the practice of engineers as expert witnesses are not synonymous.

As Bernard Ennis, P.Eng., PEO's manager of practice and standards, points out, anyone with some special expertise may act as an expert witness, but a forensic engineer acting as an expert witness will be a specialist in a particular branch of engineering who investigates, reports or gives evidence in a legal dispute involving a failure.

For instance, he says, an engineer with knowledge of the sound effects of wind turbines may be testifying as an expert witness at an Ontario Municipal Board tribunal, but that engineer "is not a forensic engineer, since he or she is not investigating a failure of some kind."

Gerry Schorn, P.Eng., president of Waterloo-based Schorn Consultants, says he'll be particularly interested in the guideline's definition of forensic engineering and its treatment of the scope of work. "Secondly, I think we have to eliminate the 'engineer for hire' or hired-gun mentality," he says. "Most experts think that if they get paid by a party, they must defend that party and not defend the truth."

Claude Pilette, PhD, P.Eng., head of Pilette Forensic Engineering in Ottawa, also says there is a need to bring more clarity to this element of engineering practice, even though the guideline might parallel some of the requirements of expert witnesses already covered in the justice systems' rules of civil procedure.

"The new rules being developed by PEO may be redundant," Pilette says. "However, the PEO rules would be useful to reprimand engineers [who] too often advocate instead of being impartial."

### NEXT STEPS

PEO is now searching for forensic engineer volunteers to serve on the guideline writing subcommittee. Volunteers should be familiar with the application of forensic engineering principles in a variety of situations, such as machinery failure, motor vehicle accidents, fires, structural collapses and process failures.

The results of their work should prove compelling, given the prevailing view that forensic engineering is a practice area growing steadily in complexity and sophistication.

To become involved in the PSC forensic engineering subcommittee, contact Bernard Ennis, manager, practice and standards, at [bennis@peo.on.ca](mailto:bennis@peo.on.ca). Σ