



Professional Engineers
Ontario

ENGINEERING DIMENSIONS

JANUARY/FEBRUARY 2013



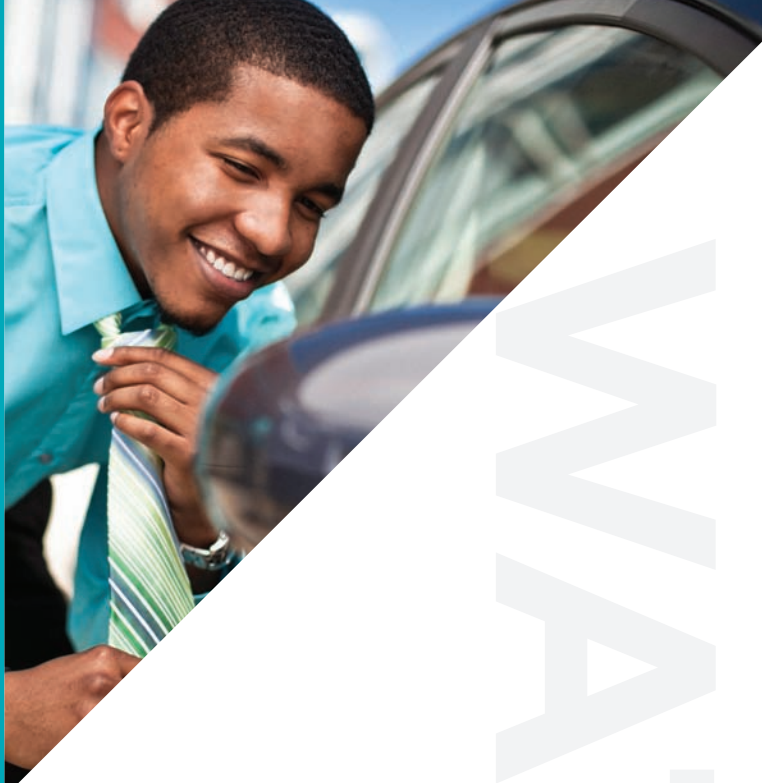
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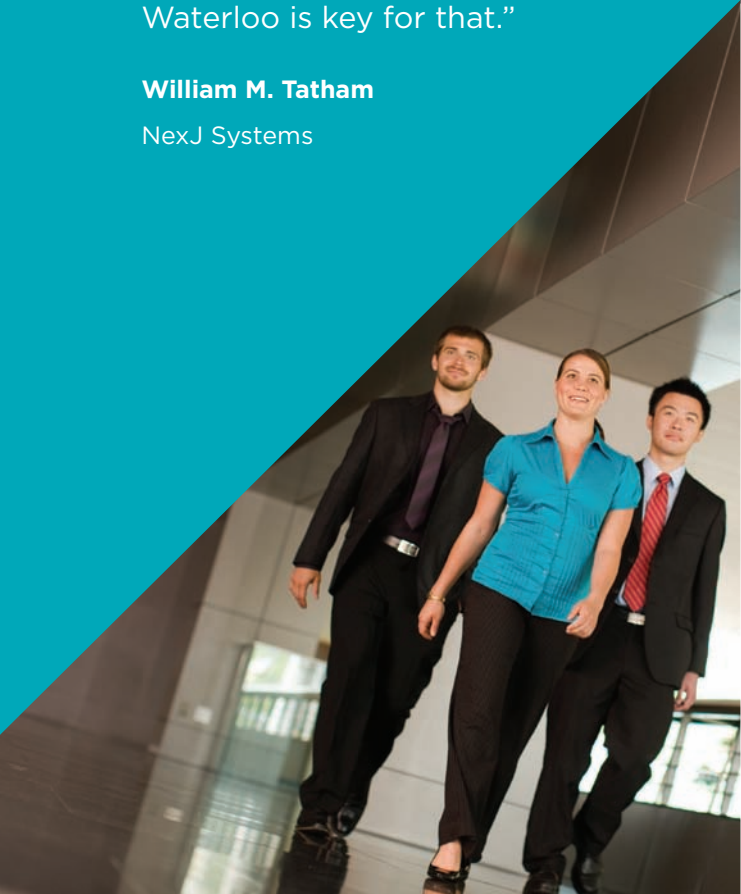
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DECIPHERING THE ROLE OF ELECTED COUNCILLORS



Denis Dixon, P.Eng., FEC
President

IT'S ELECTION TIME AGAIN and I'm very pleased that licence holders still have the right to vote for PEO's president-elect. This concept was under threat for some years as a previous council thought licence holders had not always chosen the best candidates in past elections and wanted the system changed so that council would select a president from the group of elected councillors.

To be fair, candidates may not always have a clear understanding of the laws that relate to the association and its staff, and may not have had a clear understanding of the president's power and role, leading to promises that were not in their ability to deliver. Unfortunately, the average licence holder is not in a position to know this

but I see this as no reason to take away the voting privilege of licence holders. My solution is to better inform licence holders on the realities of council's role.

PEO councillors are tasked with providing the overall direction for the association and the profession. Council deals with the high-level, strategic issues of governance while responsibility for issues relating to staffing, human resources and the administration of the *Professional Engineers Act* lie with the CEO/registrar. This breakdown is often confused during election campaigns and it's prudent to point out the separation of roles. Staff obviously plays a major role in PEO operations, and staff and volunteers must work closely together toward mutual goals so the profession can truly serve the public. But potential councillors need to understand and respect the division of functions and not overstep these boundaries.

Another misunderstood issue from the last few years is that the lieutenant governor appointees (LGAs) on council are in some way detracting from PEO governance. Because we operate under an act of the legislature, we are required to have a component of LGAs in our governance structure and the attorney general makes sure that competent people are provided to represent the public. In fact, the input from the LGAs exceeds that of many elected councillors, in most cases. Recent research shows that LGAs serve an average of 69 days a year on PEO business. Currently, only the elected president commits more time to the association. I believe any suggestion that PEO seek to reduce government input into PEO council is only likely to return PEO to the poor relationship it had with government a few years ago, when we need continued good relations with the government to make any progress at all.

One issue that has us working closely with the provincial government is the Elliot Lake public inquiry, which was established to inquire into and report on events surrounding the collapse on June 23, 2012, of part of the Algo Centre Mall. PEO is co-operating fully with the commission of inquiry and has offered to assist Justice Paul R. Bélanger, who is leading the inquiry. You can track the progress of the inquiry through the commission's website at www.elliottlakeinquiry.ca and PEO's participation through a page on the PEO website at www.peo.on.ca/News/Elliot_Lake/ElliotLakeInquiry.html. PEO also issued a professional practice bulletin in the November/December 2012 issue of *Engineering Dimensions* on structural engineering assessments of existing buildings. This document is also available on our website at www.peo.on.ca/publications/guidelinespracticebulletin2.pdf.

Another issue of collaboration involves my intention to wean council off any program that is non-regulatory and thus in the bailiwick of the Ontario Society of Professional Engineers (OSPE), and to have licence holders confirm by referendum that we are doing the right thing. Unfortunately, no issues have yet reached this stage, but we have been working together with OSPE on education proposals to the Ministry of Training, Colleges and Universities, on issues relating to the Ontario Centre for Engineering and Public Policy, and on keeping government apprised of developments in our profession.

Although it is unlikely that candidates for PEO council will have expertise in all the items currently on PEO's agenda, it would be great to elect engineers who can see the big picture—including the distinct roles of PEO and OSPE—and have an understanding of their own role in helping council make balanced decisions. Those who possess these qualities will be able to make immediate and valuable contributions to the governance of our profession. I encourage you to involve yourself in the 2013 election and to make an informed decision on our future leaders. As always, I welcome your comments and questions at president@peo.on.ca. Σ

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ENGINEERING DIMENSIONS



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Through the *Professional Engineers Act*, Professional Engineers Ontario governs licence and certificate holders and regulates professional engineering in Ontario to serve and protect the public.

THIS ISSUE: The profession seems to be under increasing pressure not only to identify hazard and risk but also to take steps to lessen its consequences. Read about how climate change and infrastructure durability are just two of the factors driving engineers to upgrade and advance their public safety toolkits.

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RISKY BUSINESS



Jennifer Coombes
Editor

“SIMPLY PUT, the practice of engineering carries with it an inherent level of risk that engineers must seek to understand and manage.” So says the model guide for risk management written by Engineers Canada (p. 45).

It’s true. Nothing in life is 100 per cent risk free. And we’ve seen shocking evidence of that recently with the Algo Centre Mall roof collapse in Elliot Lake, which is still under investigation. (PEO is now a participant with standing in Part I of the Elliot Lake Commission of Inquiry, p. 8.)

Thankfully, that tragedy is the exception rather than the rule. Overall, the safety record of Ontario’s built environment is stellar. Our current buildings and infrastructure are, for the most part, safe; their designs take into account the best available data in the form of regularly updated codes and standards and known environmental risks. Ontario P.Engs are diligent in their inspections and now have even more resources at their disposal with the introduction of PEO’s practice bulletin on structural assessments of existing buildings (www.peo.on.ca).

Still, there is always room for improvement. Infrastructure, for example, will certainly need to be improved to withstand the new climate reality. Every unusual weather event or structural failure like the one in Elliot Lake provides an opportunity to learn and add to the arsenal of knowledge for current and future engineers to draw on. But, the question is: how do you manage risk when all of the variables seem to be changing so quickly? Engineers have some innovative solutions in “Shedding new light on the nature and inevitability of risk” (p. 42).

In these changing times, engineers may also be at risk personally. In “Climate change risk: Is liability lurking for professional engineers?” (p. 27), Patricia Koval cautions that engineers failing to incorporate climate change into their designs may be leaving themselves open to legal action.

Changing times, indeed. Σ

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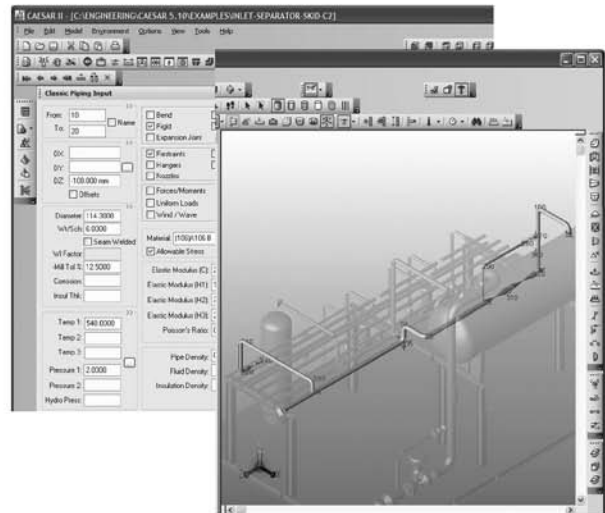
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PEO granted standing in Elliot Lake Inquiry, responds to summons to produce documents

By Michael Mastromatteo

PEO has been granted standing as a participant in Part I of the Elliot Lake Commission of Inquiry, which was established on July 19, 2012, by the Ontario government to inquire into and report on events surrounding the collapse on June 23 of a portion of the Algo Centre Mall in Elliot Lake. The collapse killed two people and injured many more.

Part I will deal with events prior to the collapse. Part II will deal with emergency management after the collapse.

The commission's decision on PEO's application for standing was released on November 8. In making its decisions on standing, the commission considered such factors as whether parties seeking standing have a "substantial and direct interest" in the subject matter of the inquiry and whether their participation would contribute to openness and fairness of the inquiry and further the conduct of the inquiry.

In relation to PEO's request for standing, the commission noted that PEO is the licensing and regulating body for professional engineering in Ontario, has launched its own investigations related to the collapse, and issues guidelines relating to professional engineering services in construction and building. "The PEO clearly has an important interest and expertise in the issues raised by the Order in Council [establishing the commission of inquiry]," the commission said in granting standing to PEO.

As a participant with standing, PEO may have:

- access to documents the commission collects, subject to the commission's *Rules of Procedure*;
- advance notice of documents proposed to be introduced into evidence;
- advance provision of statements of anticipated evidence;
- a seat at counsel table;
- the opportunity to suggest witnesses to be called by the commission counsel, and if those witnesses are not called, the opportunity to apply to Commissioner Paul R. Bélanger to lead the evidence of a particular witness;
- the right to cross-examine relevant witnesses; and
- the opportunity to make closing submissions.

In September, PEO received from the commission a summons to produce documents having to do with complaints received and disciplinary action taken in relation to specific PEO licence and certificate holders. PEO complied fully with the summons request; however, as provided for in rule 17 of

the commission's rules, it also requested an order under section 10(4) of the *Public Inquiries Act* (PIA). PEO's request was that those to whom information in the documents relates be given notice and the opportunity to consent to any pre-hearing public disclosure or to make submissions to the commission regarding use of the information. PEO's submissions were aimed at highlighting to the commission PEO's obligation to seek consent before releasing information it obtains in the course of administering the *Professional Engineers Act* that is not otherwise public. PEO did not comment in its submissions on whether any particular document should or should not be made public.

PEO APPOINTS ACTING CEO/REGISTRAR

By Michael Mastromatteo



Michael Price, P.Eng., MBA, FEC, was appointed acting CEO/Registrar of PEO October 16, 2012.

A NINE-YEAR VETERAN of PEO senior management has been appointed acting CEO/Registrar of Ontario's engineering regulator.

Michael Price, P.Eng., MBA, FEC, the current deputy registrar, licensing and finance, succeeds former CEO/Registrar Kim Allen, P.Eng., FEC, who left the association in September to become CEO of Engineers Canada.

Price's appointment was effective October 16, 2012. In addition to undertaking his new responsibilities as acting CEO/registrar, Price will continue to lead PEO's licensing and finance division.

"I am honoured and delighted at the opportunity to lead the operational management of PEO and to serve the profession at such an exciting and challenging time," Price said at the time of his appointment.

Price joined PEO in August 2003 with extensive utility industry and regulatory experience. He was the president and chief executive officer with Haldimand County Hydro for eight years, and a one-time distribution engineer with Burlington Hydro and Ontario Hydro.

In announcing the appointment, PEO President Denis Dixon, P.Eng., FEC, called Price "well acquainted with all aspects of PEO," due to his many years as a deputy registrar.

In response to PEO's submissions and another relating to confidentiality filed by the mall's owner, the commission issued a notice to participants in the inquiry and media organizations alerting them to their right to make submissions on the requests, and setting a December 17 date for hearing the submissions.

As of January 7, the commission had not issued its ruling on PEO's request for an order under section 10(4) of the PIA.

In PEO's reply submissions to those of the other participants and media, PEO notes that since its initial submissions it had worked with commission counsel to narrow the original list of confidential documents and provided contact information so that notice could be delivered to the engineers and complainants to whom information contained in the documents relates. PEO also noted that it understood that these people had now been notified. PEO further offered to assist commission counsel to find contact information by January 11, 2013, for the remaining people named in the confidential documents, so that they could be provided an opportunity to consent or make submissions on the use of their information.

Prior to making its application for standing, PEO had written to Premier Dalton McGuinty suggesting a possible need for an Ontario provincial engineer to oversee the overall health of the province's engineering works. PEO also wrote to inquiry Commissioner Paul Bélanger shortly after his appointment to offer PEO's assistance. PEO has created an Elliot Lake webpage at www.peo.on.ca/News/Elliot_Lake/Elliot-LakeInquiry.html to provide continuing information on PEO's participation in the inquiry.

The Ontario government has directed the commission to produce its report within 18 months of its establishment. The commission does not expect to begin its hearings in Elliot Lake until at least late February.

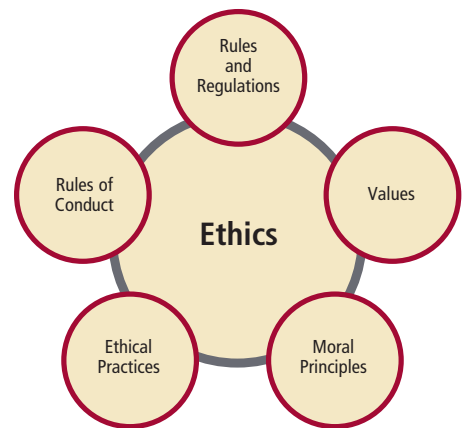
Engineers Nova Scotia adopts NATIONAL

CODE OF ETHICS

By Jennifer Coombes

ENGINEERS NOVA SCOTIA has become the third provincial engineering regulator to adopt Engineers Canada's national model Code of Ethics as its own, following in the footsteps of Professional Engineers and Geoscientists Newfoundland and Labrador, which adopted a modified version in 2008, and the Association of Professional Engineers and Geoscientists of Saskatchewan, which adopted a prior version of the code.

Adherence to the national code, outlined in the *Guideline on the Code of Ethics* (April 2012), and available at www.engineerscanada.ca/e/files/guideline_code_with.pdf, became effective for Nova Scotia P.Engs on September 30, 2012. In confirming its adoption of the national model code, Engineers Nova Scotia requested that Engineers Canada consider modifying the code's



introductory paragraph to clarify that licence holders cannot use a corporate structure to insulate themselves from having to behave according to the Code of Ethics.

The guideline was first published in 2001 and covers nine tenets that relate to the values of truth, honesty and trustworthiness, and to safeguarding human life and welfare and the environment.

PEO has not adopted the national Code of Ethics, but instead requires Ontario professional engineers to follow its own code, which can be found at www.peo.on.ca under Publications.

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ENGINEERING STARS DAZZLE, military engineers celebrated, at 2012 OPEA

By Jennifer Coombes

The Toronto Congress Centre was the place to be November 17 to witness engineers at the top of their game. Receiving coveted Ontario Professional Engineers Awards, 11 engineers were recognized for their exceptional entrepreneurial skills and research and development, management and community service work.

Presented jointly by Nadine Miller, P.Eng., Ontario Society of Professional Engineers (OSPE) president and chair, and Denis Dixon, P.Eng., FEC, PEO president, the evening was attended by MPPs Brad Duguid (Scarborough Centre), Jagmeet Singh (Bramalea-Gore-Malton) and Catherine Fife (Kitchener-Waterloo), and many men and women of the Canadian Armed Forces, who were honoured for their sacrifices and invaluable service to our country.

In a taped message from the premier's office, Dalton McGuinty thanked PEO and OSPE for taking the time to celebrate engineers, who, he says, are committed to doing things right and for the right reasons. He thanked engineers "for the way you support the province every day."



Eleven engineers were recognized with Ontario Professional Engineers Awards at the November 17 gala. Front row, left to right, David Michael Wills, P.Eng., Catherine Karakatsanis, P.Eng., FEC, R. Douglas Hooton, PhD, P.Eng., Goldie Nejat, PhD, P.Eng., and Shaker A. Meguid, PhD, P.Eng. Top row, left to right, Nikila Ravindran, MD (representing Comondore Ravindran, PhD, P.Eng., who could not attend), James Wilfred Forbes, PhD, P.Eng., Bert Wasmund, PhD, P.Eng., Stephen Carpenter, P.Eng., John Bianchini, P.Eng., and George Nowak, P.Eng.

Colonel Jennie Carignan, MSM, CD, chief of staff, Joint Task Force Central/Land Force Central Area, delivered the keynote address, reflecting on her 10-month deployment to Afghanistan as commander of the Task Force Kandahar Engineer Regiment in 2009/2010.

Carignan painted a vivid picture of her time in Afghanistan and the role military engineers play in the country. Her unit's operations included protecting troops by destroying explosives, supporting stabilization efforts through engagement with the Afghan population, establishing Afghan police stations, and developing the Afghan national army's engineering capabilities so they can eventually take over their own security.

Following the keynote, it was time for the award presentations. Here's what the OPEA recipients had to say on stage:

GOLD MEDAL

Bert Wasmund, PhD, P.Eng., DSc, Deng, FCAE, executive director, Hatch Ltd.

"I'm thrilled to be here tonight and very honoured to receive the 2012 gold medal. On pleasant occasions like this it is valid to reflect back on our many good fortunes and many good friends and colleagues who have assisted us and share in our achievements. Founder Gerry Hatch was a strong business and technology leader. He teamed me up with some very bright engineers who pushed for innovative solutions on every project. Reliance on technological innovations, engineering excellence and efficient project management became our hallmark. We were able to build the technically strong, globally based Hatch Company that you all know today. In addressing some of the challenges and important opportunities for today's engineers, we need to rekindle a strong vision and pursue innovative measures that will prove necessary for the next 50 years. Engineers need to exercise more leadership and

continued on p. 12

A closer look at health and disability insurance

How coverage can help the self-employed, contractual and underinsured

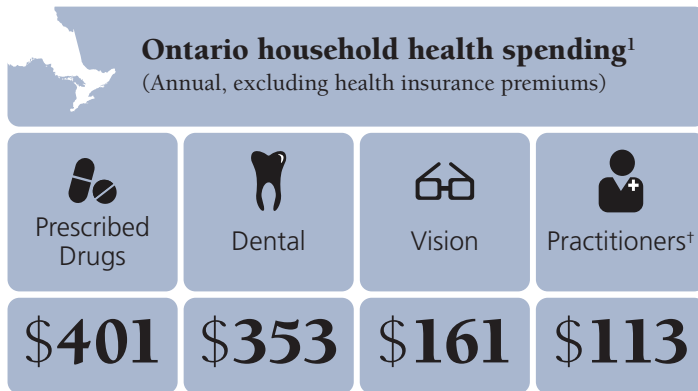
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With no supplementary health coverage, you would have to pay *out of your own pocket for common expenses* like prescriptions, dental care, vision care, therapeutic services and more.

If your spouse doesn't have coverage at work, your out-of-pocket medical expenses can get even bigger, especially if you have children.

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Disability insurance

Disability insurance helps to replace a portion of your income if you become ill or injured and can't work. These plans provide *monthly benefit payments*, based on a percentage of your monthly earnings, while you are disabled and unable to perform your occupation.

Unlike employee disability plans that end when you change jobs, some association-sponsored disability plans can *provide continuation of coverage between jobs* so you are not left without

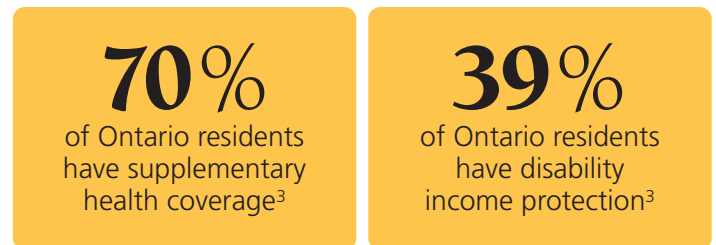
coverage while unemployed. If you become disabled within 12 months of your last job, you remain eligible for a monthly benefit payment.

Look for a disability plan that offers coverage for different types of disability, such as total disability, partial disability, residual disability (you are able to return to your regular occupation but in a limited capacity), and catastrophic loss.

And if you pay your own premiums (not your partnership), your monthly disability benefits may be tax free.²

Are you among those with protection?

Across Ontario, many residents have chosen to protect themselves with supplementary health and disability coverage. *Make sure you're protected as well.*



Cost is a common reason offered by those who are not covered by any plans to explain the lack of coverage.

Affordable coverage is available for professional engineers through the **Engineers Canada-sponsored plans**. This allows you to enjoy many of the benefits of a group plan (e.g., lower cost) so you can focus on your recovery, not on the bills.

¹ Average household annual spending (Source: Statistics Canada, 2010 Survey of Household Spending, April 2012).

² Contact your financial advisor or the Canada Revenue Agency for details.

³ Percentages are based on persons covered at end of 2010 (Source: Canadian Life and Health Insurance Association, Facts & Figures, Life and Health Insurance, 2011 Edition) and 2010 provincial population figures (Source: Statistics Canada).

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continued from p. 10

have a vision to re-establish our well-proven approach to long-term goals.”

ENGINEERING MEDAL—ENGINEERING EXCELLENCE

James Wilfred Forbes, PhD, P.Eng., chief design engineer, National Steel Car Ltd.

“I want to thank Gregory Aziz, chairman and CEO of National Steel Car, and the NSC management team for their expectation of excellence and their support in achieving it. This medal is a shared achievement of NSC’s engineering team. All of us together truly are greater than the sum of the individuals. Sir Isaac Newton once wrote, ‘If I have seen further it is by standing on the shoulders of giants.’ As engineers, we stand on the shoulders of the professors and mentors who inspired and encouraged us. All of us need to encourage, teach and mentor the next generation of engineers.”

ENGINEERING MEDAL—ENGINEERING EXCELLENCE

George Nowak, P.Eng., vice president, Hatch Mott MacDonald

“For me, engineering excellence has been my prime motivator for both demonstrating and achieving success in my professional life. Tony Russell [P.Eng.] and I have known each other for over 33 years. I wouldn’t be here without Tony’s guidance and mentoring. He showed me all the ropes and about working overseas.”

ENGINEERING MEDAL—ENTREPRENEURSHIP

Stephen Carpenter, P.Eng., president, Enermodal Engineering

“Our corporate mission statement is: number one, save the world through green buildings and communities; number two, have fun; and number three, make enough money to do one and two. I share this award with all the engineers that work in the environmental and sustainability sector. Showcasing the work that we do shows that we can make a very positive contribution to the environment.”

ENGINEERING MEDAL—MANAGEMENT

John Bianchini, P.Eng., FCAE, chief executive officer and global managing director, metals, Hatch Ltd.

“I’m thrilled and honoured to be here to receive this very prestigious award. It’s a special night because I’m being honoured alongside my career-long colleague, mentor and friend, Bert Wasmund

[P.Eng.]. Much of the recognition of this award is owed to my mentors and colleagues at Hatch, especially Gerry Hatch, our founder. He taught me the importance of doing your homework, not just with respect to the technology but as it relates to people.”

ENGINEERING MEDAL—MANAGEMENT

Catherine Karakatsanis, P.Eng., FEC, chief operating officer, Morrison Hershfield Group, Inc.

“I’m extremely honoured to receive this award, especially for something that I love to do, which is to work every day with wonderfully talented, intelligent and capable people that I respect. I started my career as a structural engineer and, because of the various recessions, I took on engineering management roles and stayed there. I believe I’ve found my calling. I have a deep love and immense pride for the engineering profession. It’s *the* most wonderful profession and I’m grateful to be part of it.”

ENGINEERING MEDAL—RESEARCH AND DEVELOPMENT

R. Douglas Hooton, PhD, P.Eng., professor, department of civil engineering, University of Toronto

“I think my most important contribution to this profession has been having provided hundreds of civil engineering students, including 70 graduate students, with specialized knowledge in concrete, a strange material. And many of my students are now industry leaders and are making an impact. And, for me, they are a continuous source of pride.”

ENGINEERING MEDAL—RESEARCH AND DEVELOPMENT

Shaker A. Meguid, PhD, P.Eng., CEng, FIMechE, LTS-AIAA, FASME, FEIC, professor, faculty of mechanical and industrial engineering, University of Toronto

“I am truly humbled and honoured to receive an award for something I really love to do. Early in my career I realized that the most important part of successful research is motivating wonderful young research students. My ability to inspire them was the foundation of my success.”

ENGINEERING MEDAL—RESEARCH AND DEVELOPMENT

Comondore (Ravi) Ravindran, PhD, P.Eng., professor, department of mechanical and industrial engineering, Ryerson University

Ravi Ravindran was absent from the gala, but was represented by his daughter, Nikila Ravindran, MD, a gastroenterologist or, as her father calls her, a tummy engineer. She said: “My father is honoured to be among the award recipients today. Just a few hours ago he was awarded the highest honour at the Indian Institute of Metals in TataNagar, India. So, he is in India 20,000 km away from Toronto accepting this award. My father is most grateful for the support of Professional Engineers Ontario and Ryerson University. We are so proud of my father. We are very honoured to receive this on his behalf.”

ENGINEERING MEDAL—YOUNG ENGINEER AWARD

Goldie Nejat, PhD, P.Eng., assistant professor, department of mechanical and industrial engineering, University of Toronto



**Associate/Full Professor in Mining-related disciplines,
Endowed Chair (Tenure Stream)**

“I, like many of the engineers in this room, think that I have the best job in the world. I get to mentor the future engineers of this country. As well, I get to work with my students to develop robots for a living. It can't get better than that!”

**PROFESSIONAL ENGINEERS
CITIZENSHIP AWARD**

David Michael Wills, P.Eng.,
past president, D.M. Wills Associates Ltd.

“As essential as it is to give back within our profession, I am only one of many who enjoys the challenge and feeling of goodwill that is often realized through participation in community work. I've been extensively involved with the United Way in Peterborough for 20 years because I believe in the organization and what it symbolizes. The United Way takes people out of poverty and builds strong communities and healthy people. There is a strong parallel between United Way values and the values of our profession.”

Many thanks to the gala sponsors of the 2012 Ontario Professional Engineers Awards for their support: The Personal, Hatch, AMEC, Deep Foundations Contractors, Lassonde School of Engineering at York University, Great West Life, Vale, Manulife Financial, TD, Consulting Engineers of Ontario, OACETT, United Brotherhood of Carpenters and Joiners of America as well as the table hosts: DM Wills, Hatch, Hatch Mott MacDonald, Jardine Lloyd Thompson Canada Inc., Morrison Hershfield, National Steel Car, Ryerson University and the University of Toronto.

The University of Toronto's Department of Civil Engineering and Lassonde Institute of Mining invite applications for a tenure-stream position at the rank of Associate or Full Professor. The successful candidate will be appointed to a prestigious Endowed Chair and be expected to take a leadership role in the Lassonde Institute of Mining. The Endowed Chair appointment is for a five-year term with the possibility of renewal following a favourable review. The successful candidate will commence his/her duties on July 1, 2013 or as soon as possible thereafter.

The Department of Civil Engineering at the University of Toronto is committed to excellence in teaching and interdisciplinary research. Candidates must have exceptional undergraduate and graduate teaching in disciplines related to mineral/mining engineering and an international reputation for innovative research in any area related to the mineral/mining industries.

The Lassonde Institute of Mining promotes and facilitates cross-disciplinary research related to challenges facing the mineral and energy sectors. Lassonde Mineral Engineering crosses traditional university disciplines to provide a diversified undergraduate education in the areas of mining, geology, and other relevant applied science and engineering. Graduates are highly sought by industry, consulting and research establishments.

Candidates should hold a doctoral degree, be eligible for registration as a Professional Engineer in Ontario, and must have demonstrated leadership, administrative capabilities, communication skills and a strong vision to develop the potential synergies that are available at the University of Toronto. Evidence of excellence in teaching and research is required. Salary will be commensurate with qualifications and experience.

All qualified candidates are invited to apply on-line at <http://www.jobs.utoronto.ca/faculty.htm> to Requisition ID: 1201583. Applications should include a cover letter, curriculum vitae, teaching dossier (including a statement of teaching philosophy), and a statement outlining current and future research interests. If you have questions about this position, please contact chair.civil@utoronto.ca. All application materials should be submitted online.

The UofT application system can accommodate up to five attachments (10 MB) per candidate profile; please combine attachments into one or two files in PDF/MS Word format. Submission guidelines can be found at: <http://uoft.me/how-to-apply>.

Applicants should also ask at least three referees to send letters directly to the department via e-mail to chair.civil@utoronto.ca by the closing date, **February 28, 2013**. Applications will be reviewed when they are received.

The University of Toronto is strongly committed to diversity within its community. The University especially welcomes applications from visible minority group members, women, Aboriginal persons, persons with disabilities, members of sexual minority groups, and others who may contribute to further diversification of ideas. All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority.





Lunchtime keynote speaker Ziya Tong, co-host and producer of *Daily Planet*.

Best practices panel members, from left: Desmond Gomes, P.Eng., FEC (moderator), Larry Tomlin, Sal Alajek, Mike Seliske, Felix Moshkovich, Brian Lee and Karen Chan, P.Eng. (CLC Organizing Committee member).

PEO chapters learn how to **LEAD THE WAY**

By Nicole Axworthy



THE 2012 Chapter Leaders Conference (CLC), held November 17, 2012, followed a classic format of panel discussions and breakout sessions, with the theme of “Leading the way.”

The conference was off and running following welcoming remarks by Wayne Kershaw, P.Eng., Western Region councillor and chair of this year’s CLC Organizing Committee; Paul Ballantyne, P.Eng., FEC, Eastern Region councillor and chair of the Regional Councillors Committee; Denis Dixon, P.Eng., FEC, PEO president; and Nadine Miller, P.Eng., president and chair of the Ontario Society of Professional Engineers.

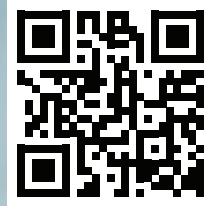
Desmond Gomes, P.Eng., FEC, a CLC Organizing Committee member representing the West Central Region, welcomed the guests of the first panel discussion, titled “Leading the Way: Best Practices”: Brian Lee, P.Eng., of the Hong Kong Institute of Engineers, Felix Moshkovich, PMP, CMC, of Project Management Institute, Sal Alajek of Engineers Without Borders, Larry Tomlin, MBA, FCMA, of CMA Ontario, and Michael Seliske, president of the Engineering Student Societies’ Council of Ontario. The discussion focused on the best practices of each organization, including member-

ship growth, whether fees make a difference to membership, and how different communication avenues are used to reach members and the public. This panel demonstrated that all of these organizations have similar challenges in terms of demographics, retention and volunteer time commitments, and shared ideas on how to attract new members while engaging with current ones, brand themselves and break down barriers with chapters.

Included in the conference lineup were three concurrent breakout sessions for participants to work on their soft skills. The first, “Effective Communications Training,” presented by Eric Bergman, author of *Five Steps to Conquer Death by PowerPoint*, provided participants with practical examples of how to enhance the effectiveness of their oral and written communication. His number one rule: “Never, ever develop your presentation using PowerPoint.” He demonstrated the concept of separating the oral and written word for effective presentations by asking attendees to try to get as much information as possible out of a 60-second advertisement that included both oral and written information. A discussion followed about different styles of delivery and how much information you might miss when using a PowerPoint presentation while speaking.

“Our working memory is so small and it’s easy to go into overload, so you must separate written and visual communication in order to be effective,” Bergman said. “Death by PowerPoint comes from an overloaded working memory.”

continued on p. 16



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continued from p. 14

Bergman discussed other concepts for effective presentations, such as the Q-ratio, which is the number of questions from the audience divided by the length of the presentation in minutes. He suggests it should be one or greater. So, for a 30-minute presentation, there should be 30 questions so that it becomes a two-way interaction rather than one-way and it gives time for people to pause and reflect.

Lunchtime keynote speaker Ziya Tong, co-host and producer of *Daily Planet* on the Discovery Channel, discussed leadership as we see it in the animal kingdom. As a way to introduce this topic, she nominated a totem creature to represent engineering—slime mold—and explained why its qualities are similar to that of an engineer, as an intelligent problem-solver who is able to forge new paths, embrace technology and is very cool. She also asked: With more than a million species on Earth, how did we become rulers of the planet or the dominant species? Why do leaders even exist? She explained that research shows it only exists if it's advantageous to an individual or group and provided examples in the animal world, such as how pigeons choose leaders who are best at leading the flock. Leaders possess the ability to teach (this is vital to the livelihood of ants), have experience (elephants follow the wisdom of their matriarch) and are trustworthy (capuchin monkeys exhibit trust by poking each others' eyes). She also said fairness is an important quality—we can tolerate low salary and bad working conditions but it's unacceptable to treat someone unfairly.

Tong also suggested there is a new leadership emerging—technocratic authorities and wiki leaders who understand networks—where engineers are needed to network and form coalitions to be leaders. She ended her presentation with one final thought: “Always



Annette Bergeron, P.Eng., PEO president-elect, shared her thoughts about the relevance of PEO's chapters and volunteers.

keep the big picture in mind and if you're going to be a leader, always keep your ego in check.”

The breakout sessions continued in the afternoon. The second, “Motivating Others Training,” involved an interactive session that delved into positive examples of how people have effectively motivated others, and looked at what they would have done differently where they were not successful. Ingrid de Buda, P.Eng., of the Ottawa Chapter, followed with a presentation about motivation and talked about the idea of positive feedback as the number one motivator and the advantages of the “thank you” formula. She also discussed the theory of motivator types, such as power-motivated and recognition-motivated people, and the general qualities of each.

Lastly, the “Chapter Story Contest, The People's Choice” showcased some of the most successful chapter events and activities of the past year. Chapter Story Contest finalists shared their stories of success—from planning, through implementation, to lessons learned. At the end of the presentations, attendees cast their votes for the top story of 2012, which was announced at the wrap-up session. Among the 10 finalists, the Algoma Chapter won the contest with its “100 Years of Engineering in Sault Ste Marie” event.

Annette Bergeron, P.Eng., PEO president-elect, ended the conference with concluding remarks about the relevance of PEO's chapters and the need to have a pool of informed volunteers to lead the way.

CLOSING THE salary gender gap

By Chrisy Wilson



Over the last 15 years, approximately 20 per cent of engineering graduates have been female. Despite the disparity between the number of male and female engineers in Ontario, pay is closely aligned at most levels.

These observations are from a recent survey conducted by Mercer (Canada) Ltd. for the Ontario Society of Professional Engineers (OSPE). Compensation data for more than 15,000 engineers across six engineering responsibility levels and 14 job types were collected from 218 organizations in both the private and public sectors. The 2012 survey reflects data for engineers working in organizations of all sizes, across a broad array of industries, located in 17 metropolitan areas in Ontario.

MINIMAL PAY DIFFERENTIATION BY GENDER

Results of the 2012 OSPE Employer Compensation Survey indicate that although most engineering graduates are male, significant pay differences do not occur until the more senior engineering levels, which have a far lower proportion of females. Approximately 25 per cent of levels A and B engineers are female but this drops to less than 10 per cent for levels E and F engineers.

A comparative review of compensation levels across genders finds that average base salaries could be up to 13 per cent higher for male engineers, as is the case for level F, bonus-eligible engineers included in the survey. However, for many engi-

neers, the gender pay gap is smaller. Some employers and engineers may be surprised to learn that for the majority of engineers, there is less than a five per cent difference between average base salaries for men and women in levels A through D.

Pay mix, or the portion of base salary compared to variable pay, tells a similar story. Although base salary starts to inch ahead for males at level D, pay mix remains relatively stable across genders at most levels. Nevertheless, as base salaries begin to increase more for males than they do for females, bonuses (often paid as a percentage of base salary) play a bigger role in an employee's total cash compensation, resulting in a larger pay gap between genders.

CANADIAN EMPLOYERS CONSIDER ENGINEERING JOBS "HOT"

It has been many years since the marketplace has observed a shift in the proportion of female engineers entering the workforce. Perhaps another surge is overdue. There are several market factors at play that could be considered encouraging—not just for women looking to enter the engineering profession, but for all future engineers.

Many Canadian employers rate their engineering jobs as "hot," a trend that has been simmering for the past couple of years. In a recent Mercer survey called "Attraction, Retention and Engagement in a Cautiously Rising Economy," organizations were asked to identify the top "hot jobs" due to skill shortages and/or market demand. Research and development, and scientific and engineering jobs made the top of the list with 37 per cent of organizations rating these jobs as hot. Furthermore, with an aging population and a significant number of baby boomers expected to retire in the coming years, many organizations will experience a loss of intellectual capital, causing critical skills gaps. In fact, many organizations are currently experiencing a shortage of highly skilled workers and although employers are hiring, they are having difficulty finding the right skills to meet their needs. Attracting and retaining key talent will likely remain top issues as the market continues to heat up. These market dynamics offer those about to enter the engineering profession a promising outlook for forging a successful career.

ABOUT THE SURVEY

Employers and OSPE members can order the 2012 OSPE Employer Compensation Survey by contacting Mercer at www.imercer.ca/ospe, 800-333-3070 or emailing info.services@mercer.com. OSPE members can access a complimentary copy of the Member Market Compensation Summary at www.ospe.on.ca.

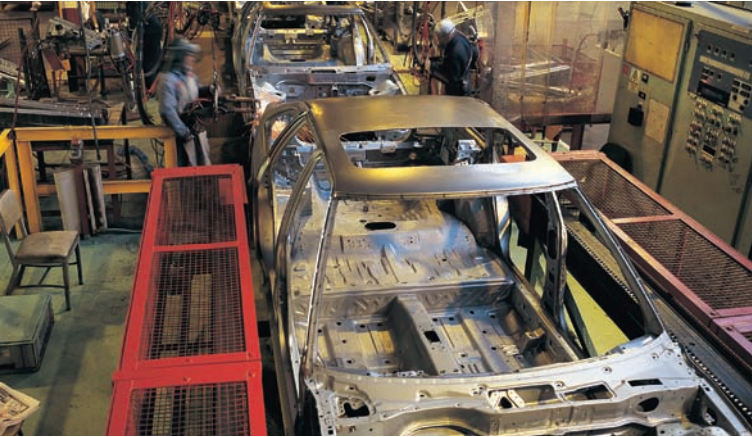
2012 COMPENSATION AT A GLANCE

- Gender pay gap narrows
- Engineering jobs are hot for employers

Chrisy Wilson is with Mercer (Canada) Ltd.

Prorogation not expected to slow industrial exception repeal

By Michael Mastromatteo



THE OCTOBER 15 PROROGUING of the Ontario parliament will have no effect on the regulator's efforts to proceed with the repeal of the industrial exception.

In the days following the suspension of parliament, some trade media reported that prorogation would delay proclamation of the repeal of section 12(3)(a) of the *Professional Engineers Act* (PEA).

However, an October 17 announcement from Marisa Sterling, P.Eng., PEO enforcement officer and project leader for PEO's Repeal of the Industrial Exception Task Force (RIETF), is clear that prorogation should have no impact on the task force's work.

Sterling also said the suspension of parliament should not impede approval of a new temporary regulation passed by PEO council that sets out a transition strategy for employers to become compliant with the new requirement that a PEO licence holder be responsible for professional engineering work done in relation to machinery or equipment used to produce products for an employer in an employer's facilities.

Sterling said staff from the Ontario Ministry of the Attorney General has confirmed neither proclamation nor the transition regulation require a vote in the Ontario legislature. Because cabinet and its committees are still functioning, the RIETF is proceeding on the assumption that the approval structure is still in place for regulations and proclamations.

Repeal of the industrial exception was part of the far-reaching *Open for Business Act, 2010* (Bill 68), which encompassed a number of amendments to the PEA, as well as to many other pieces of legislation.

After the open for business bill received royal assent on October 25, 2010, the Ontario government asked PEO to consult with the manufacturing sector to explain the scope of the repeal, and help industry with its implementation of the new requirement.

PEO has since met with industry in over 80 per cent of the province and across a broad range of manufacturing sectors. In response to the feedback received from industry, PEO council in September 2012 passed a regulation giving employers who file a compliance plan with PEO up to one year after proclamation of the repeal to be in compliance.

In addition, council approved a licensure support program consisting of on-site application review and submission seminars for groups of at least 20 applicants, more frequent professional practice examination sittings, and an extension of PEO's Financial Credit Program that waives the initial PEO licence application fee for licence applications submitted accompanying an acceptable compliance plan.

The repeal will put industry in Ontario in a position similar to that of other provinces, in which professional engineers must take responsibility for professional engineering work on machinery and/or equipment used in an employer's facility for the purpose of manufacturing products for that employer. As a result, the PEA will better complement Ontario's *Occupational Health and Safety Act* by ensuring that process machinery or equipment design considers the safety requirements audited for in pre-start health and safety reviews. This, in turn, will reduce business operation downtime and lessen machinery installation re-work.

Sterling pointed out that companies have started filing compliance plans with PEO and the associated new applications for licence are being received.

"This is evidence that the transition is already happening within the manufacturing industry and that our communication strategy has been effective in informing and supporting industry through this change," she said.

To take advantage of the licensure support program, compliance plans and new licence applications must be submitted to PEO by March 2013.

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PEO considering support of ABORIGINAL ACCESS PROGRAM

By Michael Mastromatteo

PEO is considering its level of support to a program promoting engineering education to aboriginal students.

The Queen's University Aboriginal Access to Engineering Program, operating under the school's faculty of engineering and applied science since the fall of 2011, now supports 10 native engineering undergraduates.

PEO has been asked to support the program materially and financially. PEO has also brought the access program to the attention of its Equity and Diversity Committee (EDC) for further study. Committee member Merv Dewasha, P.Eng., CEO, Neegan Burnside Ltd., is acting as liaison between PEO and the university.

"This program was developed a few years back," Dewasha says. "I was an advisor to [Queen's engineering] Dean [Kimberly] Woodhouse [PhD, P.Eng.] on aboriginal matters. She wanted to do something for aboriginals in engineering and this is the outcome. At the time of inception, I was

on the EDC team representing aboriginals. Therefore, I would say PEO was involved with the development of this initiative."

In an interview with *Engineering Dimensions*, Program Director Melanie Howard said although the program is in its infancy, it has already received positive feedback and encouragement from industry and professional associations.

Howard, who was hired as director in October 2012, says the primary focus is to reach out to younger students to encourage careers in engineering. The program also supports undergraduate aboriginal students on campus and has plans for mentoring and internship opportunities.

"It's not a program in the sense of an academic program or even an admissions program," Howard says. "We're focusing on outreach to encourage students to study math and science and look to a career in engineering. Once the students are on campus, there is the support element in terms of tutoring.

A key step in development of the Queen's program was its taking ownership of an established website, nativeaccess.com, which for the last several years has promoted engineering as a career option for aboriginal people. The site is an online resource detailing opportunities in engineering and how the profession is relevant to aboriginal people and their communities.

The Queen's access program operates under a circle of advisors that includes Woodhouse and three practising aboriginal engineers.

Duncan Cree, P.Eng., a member of Queen's University faculty of engineering, was the acting director of the program until Howard was hired.

Cree says there are a number of positives associated with the program. "Looking at the statistics, very few aboriginals are professional engineers," he says. "Engineers in aboriginal communities are required because they understand the needs of their community, such as infrastructure, water quality, housing and sewage treatment, better than anyone else. They are able to transmit engineering terms in lay terms to their community members. Pursuing an engineering degree not only opens up doors for employment, but improves a person's decision-making abilities. Some northern communities have never seen or heard of a native engineer. They need more role models."


Cree also says engineering organizations such as PEO can support the program in a number of ways. "Depending on the requirements of the program, organizations can provide spokespeople at student gatherings for

various activities as they may occur, such as summer camps, school visits and career fairs. They can provide funding for workbooks and educational materials for students."

Queen's University officials believe the access program will help reduce barriers to an engineering career for aboriginal people.

In a recent letter to Woodhouse, Kim Allen, P.Eng., FEC, former PEO CEO/registrar, pledged the regulator's support of the native access program. The letter outlined how PEO supports diversity and encourages programs related to under-represented groups. "This program will help show the engineering profession as an achievable career option for indigenous people," Allen said.

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Registration practices WIN PRAISE from FAIRNESS COMMISSIONER

By Michael Mastromatteo

PEO CONTINUES to earn high marks from Ontario's Fairness Commissioner (OFC) for its efforts to accommodate the licensing and registration needs of internationally educated applicants.

In a February 2012 audit of the registration processes of major Ontario regulatory bodies, the fairness commissioner said PEO is demonstrating "many commendable practices" in providing thorough information to all applicants.

The fairness commissioner was established in 2006 through the Ontario government's *Fair Access to Regulated Professions Act* (FARPA). The act spelled out regulators' obligations to show transparency, objectivity, impartiality and fairness in their registration and licensing requirements.

In February 2012, the fairness commissioner conducted its latest assessment of the way PEO registers people who apply for a licence to practise in Ontario, to ensure registration practices are fair and continue to improve.

In its assessment of the information provided by PEO to applicants, the OFC noted that PEO's website is fully detailed and contains all the information an applicant needs to register in the profession.

The commissioner also praised PEO for implementing recommendations aimed at increasing the information available on its website, and for providing training to staff about the objectives of fairness legislation.

One of the few areas of improvement identified by the fairness commissioner is in the area of providing information to applicants with special needs. However, the commis-



sioner noted that PEO agrees with the recommendation and will make necessary changes as part of its website enhancement project.

An official with the OFC told *Engineering Dimensions* November 8 that the commissioner is satisfied with PEO's efforts to provide thorough information to applicants and is encouraged by PEO's steps to reduce potential barriers for internationally educated applicants. For example, PEO has partnered with bridging programs, offered mentoring and other supports through its engineering intern program, and introduced a provisional licence for applicants who have met all requirements for licensing except for demonstrating one year of Canadian experience.

The two main bridging programs are at Ryerson University and the University of Toronto (U of T).

Ryerson's Internationally Educated Engineers Qualification Bridging (IEEQB) Program was established in 2007 to help internationally educated engineering graduates who had already applied to PEO to meet the academic requirements for licensing in Ontario.

U of T's new Licensing International Engineers into the Profession (LIEP) Program offers PEO licence applicants engineering courses at the university in lieu of having to write PEO confirmatory examinations. The U of T program also offers assistance in preparing for PEO's professional practice exam and support to program participants to achieve employment success.

Licensing framework examines REGULATORS' ASSESSMENT TOOLS

By Michael Mastromatteo



The October 16 Canadian Framework for Licensure meeting at PEO included small group discussions about assessment tools for engineering licence applicants.

Licensing officials from Canadian engineering regulators are one step closer to adopting common standards for assessing whether an applicant has met the requirements for obtaining an engineering licence.

At an October 16 meeting at PEO headquarters in Toronto, some 50 admissions officials from 11 provincial and territorial engineering associations gathered to discuss assessment tools for licence applications.

The meeting was organized as part of Engineers Canada's Canadian Framework for Licensure (CFL) project, which aims to produce a series of foundational documents to help regulators enhance the quality, consistency and fairness of their regulatory processes.

The project also aims to improve public safety, while enabling increased mobility of registrants and licensed practitioners from one province or territory to another.

All Canadian engineering associations already agree that the basic requirements for becoming licensed as a professional engineer are in five areas: academic qualifications, engineering work experience, language proficiency (English or French), knowledge of relevant law and ethics, and good character and professionalism.

The CFL hopes an outcome will be the creation of a manual of accepted techniques for assessing the five requirements for engineering licensure.

"I was really encouraged to see such a strong spirit of collaboration in the room," said Stephanie Price, P.Eng., manager

of qualifications for Engineers Canada. "It confirmed for me that we all have the same goal: to license qualified applicants efficiently, and that we all have relatively similar processes for doing so. There's obviously still some work to be done to better define some requirements and to work on better processes for the evaluation of others, but overall it was a big success."

In welcoming participants to the meeting, Engineers Canada CEO Kim Allen, P.Eng., FEC, said fostering consistency among regulators' registration and admission practices satisfies government expectations that professional associations are working to improve labour mobility throughout Canada and standardizing assessment practices should help combat the situation of applicants moving from province to province in hopes of obtaining an engineering licence in one of them that can then be transferred to any of the others.

For Mark Flint, P.Eng., CEO, Association of Professional Engineers and Geoscientists of Alberta, the meeting was a first step in engineering regulators sharing best practices in the assessment of applicants for licensure.

"We're trying to make sure the public safety and public interest is protected, and we're trying to ensure there is a good standard of professionalism across each of the provincial regulators," Flint said. "How we get there is a little different from province to province. So it's the reconciliation of those differences that we're trying to grapple with here... At the end of the day, we all want the same thing—competent, capable engineers who have the right qualifications with a suitable academic standard."

Dennis Peters, PhD, P.Eng., associate professor, computer and electrical engineering, Memorial University of Newfoundland, and a member of the Canadian Engineering Qualifications Board (CEQB), attended the licensing meeting at the behest of Engineers Canada.

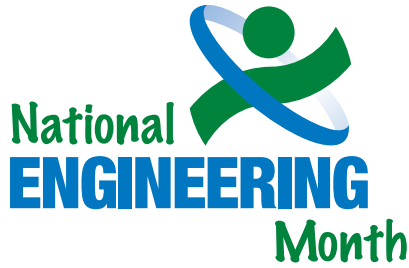
At the CEQB, Peters chairs a task force examining "good character" requirements for applicants and licensed engineers.

Peters said it's key for admissions officials from Engineers Canada's constituent associations to learn from each other's experience.

"Due to inter-association mobility and the nature of engineering work in our modern society, registration committee officials in constituent associations are seeing a large number of transfers and members who are registered in multiple jurisdictions," Peters said. "Harmonizing the practices gives the associations confidence that we know what it means to be registered in another jurisdiction and also makes things simpler for the member, since the same practices apply to all."

Len White, P.Eng., FEC, CEO and registrar, Engineers Nova Scotia, is a member of the CFL Steering Committee. White attended the October 16 meeting and said moving toward greater uniformity of admissions practices across Canada "is absolutely critical." "Governments demand it, and the public certainly has a right to expect it. There is no reason why our associations should have different admissions standards or practices."

[NATIONAL ENGINEERING MONTH]



2013 ONTARIO EVENT HIGHLIGHTS

National Engineering Month (NEM) is a Canada-wide, month-long celebration designed to raise awareness of engineering and engineering technology, and the contributions they make to our daily lives. This year, Ontario will be celebrating engineering and technology from March 1 through March 31. Through a partnership among Engineers Without Borders Canada, Professional Engineers Ontario (PEO) and the Ontario Association of Certified Engineering Technicians and Technologists (OACETT), over 140 volunteer-staged events will take place throughout the province, offering a great opportunity to have fun—whether you decide to volunteer or simply attend an event with your family. For more information on volunteer opportunities and an up-to-date listing of NEM Ontario events, visit <http://blogs.ewb.ca/nemontario/>, like our Facebook page and follow us on Twitter @nemontario.

BRAMPTON

6TH ANNUAL BRIDGE-BUILDING CHALLENGE **March 17** PEO's Brampton Chapter hosts a bridge-building challenge for kids in the Peel Region in grades 5 to 10. Contact Desmond Gomes, P.Eng., at 905-951-5000, ext. 3537.

BROCKVILLE

5TH ANNUAL BRIDGE-BUILDING COMPETITION **March 1 to March 31**, Westminster Public School PEO's Thousand Islands Chapter hosts its fifth annual bridge-building competition. Responsibility, perseverance, honesty and resilience are values practised by teams of up to four students, who will be given four weeks to design and construct their bridges. On testing day an engineer will evaluate the bridges. Contact John Ireland, P.Eng., at john@ireland.ca or 613-283-1788.

BURLINGTON

ENGINEERING CHALLENGE: NATIONAL ENGINEERING MONTH CELEBRATION **March 17**, Burlington Art Centre PEO's Hamilton-Burlington Chapter hosts an engineering challenge for high school students and university engineering students. Contact Raj Jain, PhD, P.Eng., at 905-592-0250.

CHATHAM

LOCAL AND PROVINCE-WIDE STUDENT ENGINEERING CHALLENGE **March 2** PEO's Chatham-Kent Chapter hosts two impromptu design competitions for Lambton-Kent area schools: the junior division for grades 7 and 8 students; the senior division for high school students. The junior division will be part of the Province-wide Student Engineering Challenge. Students will be given a task and materials to design and construct their solution to a problem. Contact Juan Rincon, EIT, at 519-436-4600, ext. 2934.

CHATHAM KENT CANSTRUCTION **Downtown Chatham Centre** PEO's Chatham-Kent Chapter hosts a canstructure competition, in which

different community companies and institutions will participate. Contact Juan Rincon at 519-436-4600, ext. 2934.

ETOBICOKE

6TH ANNUAL ENGINEERING IDOL COMPETITION **March 2**, Ryerson University PEO's Etobicoke Chapter hosts its sixth annual Engineering Idol competition, where teams from seven selected high schools will participate in an engineering task associated with the project "piezo electric power." Each team of four to six students with a teacher or supervisor will design and build a device using piezo electric technology that has an application to benefit society. Visit www.engineeringidol.com or contact Richard Weldon, P.Eng., at 416-964-3246.

INNISFIL

BRIDGE-BUILDING COMPETITION **March 2**, Natyr Shore Secondary School PEO's Simcoe-Muskoka and OACETT's Georgian Bay chapters will host a bridge-building competition for students in grades 5 through 8. Student teams from area schools will build their bridges before competition day from materials event organizers provide, following the "bridge construction guide." Each bridge will be judged for creativity, design, aesthetics, construction quality and breaking strength. Contact Trevor Bolt, P.Eng., at tbolt@varcon.ca or 705-735-0143, or Michael W. Simpson, P.Eng., at michael.simpson@ieee.org.

KENORA

MANAGING ENERGY RESOURCES IN THE 21ST CENTURY **March 9**, Best Western Hotel PEO's Lake of the Woods Chapter invites young

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and established engineering and technology professionals as well as the general public to presentations from Ontario Power Generation management on hydro, Ontario energy programs, RETSCREEN software and green energy, and design/retrofit workshops from a certified energy manager and a certified measurement and verification professional. Contact Keith Loucks, P.Eng., at 807-468-4445 or northwindenergy@kmts.ca.

LONDON

BRIDGE-BUSTING COMPETITION Several dates in March, starting March 11, Boys and Girls Club PEO's London Chapter hosts a bridge-building competition. Bridges will be built to withstand a load test. Come out during March break! Pizza included and all supplies will be provided. Contact Maha El-Birani, EIT, at 519-667-4140.

NATIONAL ENGINEERING MONTH KICK-OFF LUNCHEON March 4, Convention Centre Hilton PEO's London Chapter hosts the NEM Kick-Off Luncheon. John Braam, P.Eng. (city engineer), and Harold Browne, P.Eng., will give the keynote addresses. Topics will include the benefit of engineers getting involved with government to influence change, and finding solutions to problems for the future while ensuring safety remains paramount. Tickets \$35. Contact Western Regional Office for tickets at wro@peo.on.ca.

GUIDING EXPLORING TECHNOLOGY –SCOUTING EXPLORING TECHNOLOGY 2013 (GETSET'13) March 2, Scouts Canada SWO Admin Centre, 531 Windermere Rd. London's OACETT Chapter presents a fun day for 10- to 18-year-old youth members and non-members of guides/scouts, who will experience local engineering tech-

nology by participating in hands-on tech table displays, tech talks, off-site tech tours at partner locations and such tech tasks as a popsicle stick bridge-building contest. Contact Peter Nicholas, CET, at 519-878-0942 or penergy@rogers.com.

MISSISSAUGA

BRIDGE-BUILDING CHALLENGE March 2, Tomken Road School PEO's Mississauga Chapter hosts a bridge-building challenge where Peel District School Board grades 7 and 8 students will design, construct and test bridges. Contact Amr Kaoud, P.Eng., at 647-271-9999.

MATHEMATICS CHALLENGE March 24, Olive Grove School PEO's Mississauga Chapter is designing math questions in the form of engineering problems that are to be solved by students. Students respond to the questions through remote clickers. Contact Amr Kaoud, P.Eng., at 647-271-9999.

NEWMARKET

2013 DESIGN CHALLENGE March 28, Newmarket High School The Education Committee of PEO's York Chapter challenges grades 6 and 8 student teams to an engineering problem-solving challenge. Contact Paymon Sani at 416-804-6909 or education@peoyork.com.

NIAGARA FALLS

NIAGARA ENGINEERING WEEK LUNCHEON Club Italia The Niagara OACETT Chapter will host a luncheon that brings together the Niagara engineering community, from industry

leaders and colleagues to engineering and technology students. This event raises money for a local student bursary program and includes presentations and an awards ceremony. To register, contact Jim Sorley, CET, at jim.sorley@npei.ca or 877-270-3938, ext. 6224.

NORTH BAY

BALSA WOOD BRIDGE-BUILDING COMPETITION March 1 PEO's North Bay Chapter challenges local students to build bridges using balsa wood. Prizes to be awarded for greatest weight-to-load ratio and for finish and build quality. Contact Luc Roberge, P.Eng., at 705-498-2428.

OAKVILLE

NEM 2013—ENGINEERING A SUSTAINABLE FUTURE March 2, 10:00 a.m. to 3:30 p.m., Holy Trinity Catholic Secondary School PEO's Oakville Chapter is planning a full day of activities to celebrate National Engineering Month for students at local schools (all levels) in the Milton and Oakville areas. Activities will include a human interaction workshop and a future vehicles challenge. Contact Parisa Mahdian, P.Eng., at 416-317-4844.

OSHAWA

8TH ANNUAL BRIDGE-BUILDING CONTEST March 2, University of Ontario Institute of Technology PEO's Lake Ontario Chapter invites all elementary school students (grades 4 to 8) from Durham Region School Board to participate in a bridge-building contest. Students will build a popsicle stick bridge using no more than 200 popsicle

sticks to span 500 mm. Contact Derek Van Ee, P.Eng., at 416-659-2222.

OTTAWA

ENGINEERING OUTREACH EVENTS

March 4, Canada Science and Technology Museum; March 9, Space and Aviation Museum; March 10, Canadian Museum of Civilization

PEO's Ottawa Chapter is hosting engineering outreach events for kids under 14 to give them a better appreciation of engineering, how to apply science and math, and how engineering benefits our everyday lives. Contact Pierre Legault, P.Eng., at 613-996-9873.

UNIVERSITY OF OTTAWA OUTREACH EVENT March 6, University of

Ottawa PEO's Ottawa Chapter is hosting an outreach event for engineering students to help them understand professional engineering accreditation. The event will also be a mentoring opportunity. Contact Pierre Legault, P.Eng., at 613-996-9873.

OXFORD MILLS

3RD ANNUAL BRIDGE-BUILDING COMPETITION March 1 to March

31, Oxford on Rideau Public School

PEO's Thousand Islands Chapter hosts its third annual bridge-building competition. Responsibility, perseverance, honesty and resilience will be values practised by teams of up to four students who will design, construct and test their bridges. Students will be given four weeks to design and construct their bridges and on the testing day an engineer will evaluate them. Contact John Ireland, P.Eng., at john@ireland.ca or 613-283-1788.

PEMBROKE

SPACECRAFT THRUST STRUCTURE-BUILDING COMPETITION March 6,

1 p.m. to 4 p.m., Pembroke Mall,

Ottawa Valley PEO's Algonquin Chapter challenges grades 5 to 7 students in a first-ever spacecraft thrust structure building competition. Contact Thomas A. Moir, P.Eng., at 613-687-6125.

PETERBOROUGH

ENGINEERING MONTH CHALLENGE

March 5, Evinrude Centre The Peterborough PEO and OACETT chapters and the Institute of Electrical and Electronic Engineers (IEEE) invite area students to participate in the design and construction of a catapult to launch a capsule into orbit. Contact Dan Manns, P.Eng., at daniel.manns@ge.com or Diane O'Heron at d_oheron@hotmail.com or 705-779-7294.

SARNIA

IMPROMPTU DESIGN CHALLENGE

March 30, Lambton College, 1457

London Road PEO's Lambton Chapter hosts a design and building challenge for local high school students at Lambton Mall. Students will be told what they are building once they arrive at the event. Contact Richard Hui, P.Eng., at 519-344-6868.

SAULT STE. MARIE

SAULT STE. MARIE ENGINEERING

MONTH EVENT March 17 to 23,

Sault Ste. Marie Station Mall PEO's Algoma Chapter hosts a series of engineering outreach activities in various local schools throughout the week leading up to the annual engineering day on March 23 at the mall. This will

include engineering displays from local businesses, a team math challenge, colouring contests, robotics displays and other exciting interactive displays. Contact Michael Paciocco, EIT, at 705-575-7379.

SCARBOROUGH

POPSICLE STICK BRIDGE-BUILDING COMPETITION March 2, Scarbor-

ough Civic Centre PEO's Scarborough Chapter hosts a popsicle stick bridge-building competition to be held in two groups: the junior division is grades 3 to 6; the senior division is grades 7 and 8. Bridges are to be constructed of popsicle sticks and must weigh less than 250 grams. The bridges will be judged on creativity, construction quality and technique, aesthetics and more. To register, contact Narayanapillai Asogan, P.Eng., at 416-901-5266 or nasogan@hotmail.com.

HANDS-ON SCIENCE FAIR & TECHNOLOGY EXHIBITS

The Toronto East and Central PEO and OACETT chapters invite students to participate in various interactive exhibits that progressively teach more complex scientific principles and how they are applied in the real world through engineering. Contact Pasha Mohammed, C.Tech, at 416-820-1600 or abbupasha@yahoo.com.

SMITH FALLS

9TH ANNUAL BRIDGE-BUILDING COMPETITION March 1 to March 31,

Duncan J. Schouler Public School

PEO's Thousand Islands Chapter hosts its ninth annual bridge-building competition. Responsibility, perseverance, honesty and resilience will be practised by teams of up to four students who will design, construct and test their

[NATIONAL ENGINEERING MONTH]

bridges. Students will be given three weeks to design and construct their bridges and, on the testing day, an engineer will evaluate them. Contact John Ireland, P.Eng., at john@ireland.ca or 613-283-1788.

SUDBURY

ROBOT-BUILDING COMPETITION

March 6, 10 a.m. to 3 p.m., Cambrian College OACETT's Sudbury Chapter challenges students from Cambrian College and College Boreal in its first robot-building competition. Contact Andrew Dryland, CET, at 705-560-5555.

THUNDER BAY

3RD ANNUAL CONFEDERATION COLLEGE STUDENT TECHNOLOGY SYMPOSIUM CONFEDERATION COLLEGE

The Thunder Bay OACETT Chapter and the Confederation College Student Engineering Technician/Technology Association invite students to attend a symposium on technology topics related to their areas of study. Topics will include architectural, civil, construction, electronics, instrumentation, environmental and mining. There will be around five hours with four sessions of 12 speakers and a celebratory networking dinner. Contact Bruce Elliot, CET, at 807-475-6366 or Bruce.Elliot@confederationc.on.ca.

TIMMINS

NATIONAL ENGINEERING MONTH

EVENTS Grade 5 Popsicle Bridge Competition PEO's Porcupine-Kapuskasing Chapter will host a presentation on bridges and structural design for grade 5 students, who will then design and build their own popsicle stick bridge within certain criteria and lim-

ited materials over two weeks. The group with the strongest bridge will be invited to the NEM Dinner Event.

SOFTWARE ENGINEERING CONVENTION (BY SCIENCE TIMMINS)

In collaboration with Science Timmins, PEO's Porcupine-Kapuskasing Chapter will host an activity for students from grades 5 through 12, who will give a presentation about what they've learned about computer software and network technology. The winners of the convention will be invited to the NEM Dinner Event.

NEM DINNER EVENT Executives, engineers, post-secondary students and the competition/convention winners are invited to attend this dinner party. The event will be hosted at the Porcupine Dante Club where a local guest speaker in the engineering field will give a presentation about new or recent engineering projects occurring in the region.

TORONTO

WATER FOR THE WORLD (WFW)

2013 March 1 to March 31 The classic WFW workshops are back in 2013 as a way to engage youth, our future innovators of global change, in National Engineering Month. Along with the workshops that will be held the week of March 4 to 8, make sure to look out for equally engaging pre and post activities that will tackle theory and application and surely get the creative juices flowing. Contact Arashdeep Bains at a_bains07@hotmail.com.

10TH ANNUAL FRENCH SCHOOLS BRIDGE-BUILDING COMPETITION

March 4, 9 a.m. to 2 p.m., Jeanne Lajoie Elementary School The Design Challenge-Construct a Bridge Group invites teams of grades 5 and 6 French-language students to construct bridges

using supplied K'NEX or LEGO in one hour with the least amount of material (400 grams maximum) to withstand the highest load at mid span. Contact Mervat Rashwan, P.Eng., at 905-763-2745 or mervat.sil@rogers.com.

10TH ANNUAL YORK REGION BRIDGE-BUILDING COMPETITION

March 31, St. Theresa of Lisieux Catholic High School, 230 Shaftbury Avenue, Richmond Hill Grades 5 and 6 students from all York Region schools are asked to construct bridges using supplied K'NEX or LEGO in one hour with the least amount of material (400 grams maximum) to withstand the highest load at the mid span. Contact Mervat Rashwan, P.Eng., at 905-763-2745 or mervat.sil@rogers.com.

WINDSOR

WINDSOR ESSEX ENGINEERING

WEEK The Windsor-Essex Engineering Week Committee presents a poster competition, a high school design competition, events at Canada South Science City, and an awards presentation luncheon. Awards presented at the luncheon include Technologist of the Year, Engineer of the Year and two engineering scholarships valued at \$500 each. Contact Pamela Brydges, CET, at 519-966-2250 or Pam.Brydges@stantec.com. Σ

CLIMATE CHANGE RISK: IS LIABILITY LURKING FOR PROFESSIONAL ENGINEERS?

By Patricia Koval, LLP



KNOWLEDGE ABOUT CLIMATE change has led, and is continuing to lead, to a significant understanding of its current and potential future effects across Canada. It is becoming widely understood, for example, that in northern Canada, roads and air landing strips are buckling because their foundations no longer rest on permanently frozen ground. Similarly, it is accepted that Arctic sea ice is shrinking, subjecting coastal communities to rising sea levels and battering storms. Further south, most Canadian provinces can expect, among other things, increasing precipitation; increased intensity of storm events, such as flooding, ice storms, heavy winds and tor-

nados; more frequent and severe freezing and thawing cycles; and a growing number of summer heat wave days. Along with this knowledge comes the understanding that if infrastructure is not adapted to these changes and events, property damage and/or personal injury is almost certain to occur. This has potentially serious ramifications for design professionals, including engineers.

A parallel development to the growing scientific knowledge on climate change is that this issue is increasingly preoccupying governments, which have the power to implement legislation to deal with it, and the courts, which have the power to apply and develop the common law in this context. A variety of legal actions charging different types of actors for alleged actions or omissions have occurred or are now underway—all related in some way to climate change. Our law is, therefore, evolving as our knowledge of climate change and its effects evolves.

The issue of potential legal liability for failing to adapt infrastructure to climate change-related risk has become a key issue over the past year. Laws, building codes and standards are beginning to be amended to take into account the potential impact of climate change on infrastructure assets, but significant changes are still some time away.

There is a real risk that infrastructure stakeholders, i.e. those integrally connected with infrastructure ownership, planning, design, development and operation, could be liable to people who suffer personal injury or property damage caused by infrastructure that has been adversely affected by climate change. In fact, the legal framework in Canada currently permits a court, in the right circumstances, to find infrastructure stakeholders legally liable for personal injury and property damage suffered by third parties, including, in the case of design professionals, on the basis of negligence.

NEGLIGENCE

The law of negligence provides a means by which a person may seek compensation for damages he or she suffered because of another's failure to take reasonable care. For example, if the quantity of snow on the roof of a building causes the building's roof to collapse resulting in personal injury, those injured may seek compensation. If the degradation of permafrost causes the foundation of an above-ground water system to be compromised resulting in water contamination and cleanup costs, people injured or who own property that has been damaged may seek compensation.

The following types of infrastructure stakeholders could be liable in the circumstances described:

- design professionals for injury or property damage suffered by owners and third parties as a result of negligent designs, failure to warn, and negligent supervision and inspections;
- infrastructure owners for injury or property damage suffered by contractual entrants, licensees, invitees and trespassers resulting from the owners' failure to make their property safe;
- contractors for injury or property damage suffered by project owners and third parties for failing to construct according to design specifications, in a well-executed manner, and using proper construction methods and materials

PROFESSIONAL PRACTICE

reasonably fit for the project; and

- governmental authorities for injury or property damage suffered by property owners and third parties as a result of negligent inspections.

On the basis of Canadian case law, there are clear circumstances in which liability could be extended to design professionals, including engineers. There is an established duty of care between a design professional and an owner. In addition, there may be a contractual duty owing by a design professional to an owner under the terms of its contract. (This contract may, however, modify or limit the duty of care on the part of the professional, or wholly or partly limit an owner's right to sue under it.) Design professionals also owe a duty to third parties who suffer damage as a result of negligent design.

The standard of care that a design professional owes is to take reasonable care to ensure that a design complies with the standard of a reasonable professional in the same circumstances. The same standard of care is owed to a third party who might suffer damages or injury as a result of a negligent design. Whether a design professional took reasonable care will usually be measured against the professional standard at the time the design was prepared.

Following the standard practice of one's peers can be strong evidence of reasonable and diligent conduct but, importantly, it is not determinative. Rather, it is possible that the standard practice may itself be judged deficient in certain circumstances and, accordingly, adhering to such practice

would be considered negligence. For example, given knowledge of climate change effects in a geographic area as a result of the proliferation of climate-related information and projection models, if the "standard practice" at the time of designing a specific type of infrastructure project is to ignore potential climate-change effects (despite widely available evidence), the standard practice itself may be negligent. Adhering to a deficient standard would be a breach of a design professional's standard of care to an injured person.

In other words, liability might arise where a design professional complies with the minimum standards set out in laws, codes and standards, but these standards fall below those of "a reasonable person" in the legal sense. If a design professional is concerned that applicable laws, building codes or standards lack consideration for the impacts of climate change on an infrastructure asset, a design professional should consider whether it is even reasonable to rely on those laws, building codes or standards in the circumstances. In other words, would a "reasonable person" simply rely on them in designing the infrastructure asset or would a reasonable person in these circumstances design an infrastructure asset to a standard greater than the minimum standard set forth?

In making his or her determination, the design professional should try to determine whether others are designing to a standard greater than required by these existing standards. For example, if some design professionals are making the necessary modifications, others could well be liable to third parties if the infrastruc-

ture they are designing failed to take into account such considerations, even if the infrastructure were constructed according to applicable laws, building codes and other standards.

In addition to the general duty of care, a design professional may, in certain circumstances, owe a duty of care when making, or failing to make, representations or statements to those people who are relying on the design professional's expertise in matters relating to design; this duty of care includes a duty to warn of danger. If a design professional negligently fails to warn those people who are relying on his or her expertise of matters relating to the design of a particular risk or danger (i.e. climate change-related risk), that individual may be liable for breaching his or her common law duty to warn.

PROTECTING AGAINST LIABILITY

A finding of legal liability against a design professional may be challenged in relevant circumstances on the basis of, for example, statutory or contractual limitation periods, or depending upon available evidence, whether climate change-related event risk in the relevant geographic area to the relevant type of infrastructure can be foreseen. Contributory negligence on the part of others, i.e. owners or contractors, may also be a factor in assessing the dollar amount of liability.

To minimize the risk of liability for failing to adapt infrastructure to climate change-related risk, all infrastructure stakeholders, i.e. governmental entities, design professionals, contractors, owners and occupiers, should consider whether climate change-related events or effects could affect an infrastructure asset during its lifecycle. If the answer is yes, they must consider whether the technology exists to design and construct projects in a manner that can sustain climate change events and how other projects, in similar conditions, have been designed and constructed. In addition, design professionals, contractors and governmental authorities providing permits and conducting inspections will, in certain circumstances, have a duty to warn of climate change risk and adaptation methods. Ultimately, the heightened costs involved in considering and taking these enhanced actions must be weighed against, among other factors, the prospect of liability for failing to do so. Σ

Patricia Koval, LLP, a partner in Torys' Corporate Group, is a practitioner in corporate and mergers and acquisitions law. She is also co-chair of Torys' Climate Change Practice Group, which advises on challenges and opportunities related to global warming.

DECISION AND REASONS

In the matter of a hearing under the *Professional Engineers Act*, R.S.O. 1990, c. P.28; and in the matter of a complaint regarding the conduct of CHITRA K.G. PERERA, P.ENG., a member of the Association of Professional Engineers of Ontario.

This matter came before a panel of the Discipline Committee for hearing on February 9, 2012, at the Association of Professional Engineers of Ontario (the association) in Toronto.

THE ALLEGATIONS

The allegations against Chitra Perera, as stated in the Notice of Hearing dated January 16, 2012, are that Perera was guilty of professional misconduct under section 28(2)(b) of the *Professional Engineers Act* (the act), which is reproduced below:

Professional misconduct

- (2) A member of the association or a holder of a certificate of authorization, a temporary licence, a provisional licence or a limited licence may be found guilty of professional misconduct by the committee if,
- ...
- (b) the member or holder has been guilty in the opinion of the Discipline Committee of professional misconduct as defined in the regulations.

The sections of Regulation 941 made under the act that are relevant to the alleged misconduct are:

- SECTION 72(2)(D): failure to make responsible provision for complying with applicable statutes, regulations, standards, codes, by-laws and rules in connection with work being undertaken by or under the responsibility of the practitioner;
- SECTION 72(2)(H): undertaking work the practitioner is not competent to perform by virtue of the practitioner's training and experience; and
- SECTION 72(2)(J): conduct or an act relevant to the practice of professional engineering that, having regard to all the circumstances,

would reasonably be regarded by the engineering profession as disgraceful, dishonourable or unprofessional.

THE EVIDENCE

The association filed an Agreed Statement of Facts dated November 1, 2011, and signed by the parties. The association and Perera did not call any witnesses or introduce any other evidence.

The entire Agreed Statement of Facts is reproduced "as is" below:

1. At all material times, Chitra K.G. Perera, P.Eng. (Perera), was licensed as a professional engineer pursuant to the *Professional Engineers Act*, and was a member of the Association of Professional Engineers of Ontario (PEO).
2. From July 2003 and at all material times, Perera was employed as an engineer by MNA Engineering Ltd. (MNA), which held a Certificate of Authorization issued by PEO allowing it to offer and provide to the public services that are within the practice of professional engineering. Ponnudurai Balendran (Balendran), a member of PEO, is the contact professional engineer listed under MNA's Certificate of Authorization.
3. Perera does not have any laboratory testing certification with the Canadian Council of Independent Laboratories (CCIL) or other organization.

Ministry of Transportation contract

4. In or about 2007, the Ministry of Transportation Ontario (MTO) contract 2007-2264 was

awarded to B. Gottardo Construction Limited (Gottardo), with a starting date of July 18, 2007, and a completion date of October 12, 2009. The project included grading, drainage, granular base, hot mix paving, illumination and four concrete bridge structures on Highway 410 from Mayfield Road to Highway 10.

5. The MTO contract required high performance concrete to meet specifications including SP 904S13, which details the construction requirements and acceptance criteria for various concrete structural elements. One of the acceptance criteria is that the hardened concrete must meet air void system (AVS) parameters for minimum air content and maximum spacing factor.
6. The two factors are important to the long-term durability of the concrete in that the air content and distance between air voids (spacing factor) impact on the concrete's ability to resist freeze thaw damage.
7. The spacing factor was required to meet MTO and CSA specifications with a maximum measure of 0.250 mm. If a concrete core sample fails to meet this criterion, the lot of concrete represented by the cores is considered unacceptable, and is subject to removal and replacement or price adjustment.
8. The spacing factor is a function of the number of "air voids intercepted" counted under microscopic examination of the polished surface of the concrete samples. The higher the number of air voids intercepted, the lower the spacing factor.
9. The AVS testing was to be carried out pursuant to the "Standard Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete" published by the American Society for Testing and Materials (ASTM 457).
10. Gottardo was responsible for delivering concrete core samples to a laboratory of its choosing, provided it was on the MTO's list of qualified laboratories and operators for the specific test.
11. MNA was retained by Gottardo as the quality control laboratory to perform AVS testing on

high performance concrete samples for MTO contract 2007-2264.

AVS Testing at MNA

12. Perera was the engineer at MNA who signed AVS parameter results reports (the AVS reports) on concrete samples tested in MNA's laboratory for the MTO contract. She signed the AVS reports using her P.Eng. designation.
13. However, Perera was not designated by MNA or certified to carry out testing of core samples under microscope.
14. The samples themselves were tested by Xue-mei Zhang (Zhang), a certified AVS operator employed by MNA, who is not an engineer. Zhang collected data from each concrete sample on handwritten worksheets (the worksheets), which she submitted to Perera. In particular, the air voids intercepted were counted by Zhang and recorded on the worksheets.
15. Perera was responsible for calculating the spacing factor and other parameters based on data Zhang recorded on the worksheets, in order to complete the AVS reports. She submitted the signed AVS reports to Gottardo.

MTO investigation of altered worksheets

16. On or about July 17, 2008, the contract administrator (CA) submitted a summary of the AVS results to the MTO Central Region Quality Assurance (QA) office. Fifteen of the 18 sample results reviewed were identified as having spacing factor test results to be slightly below the maximum allowable limit of 0.250 mm, i.e. between 0.240 and 0.250.
17. As a result of the findings, the MTO's QA section requested audit testing of two of the concrete core samples marked as 50-5 and 50-8. This was followed by referee testing on those two lots of concrete, plus a third (50-5, 50-8 and 50-2).
18. The audit revealed that one out of the six samples (i.e. one of three lots) was determined to be unacceptable based on the referee test results. (The referee confirmed that the cut surface of each core was defectively polished and

SAMPLE LOT	APPROXIMATE NUMBER OF ALTERATIONS	SPACING FACTOR REPORTED BY MNA ON SIGNED AVS REPORTS	SPACING FACTOR CALCULATED BY MTO BASED ON ORIGINAL DATA	SPACING FACTOR AS TESTED BY REFEREE HIRED BY MTO
50-4-1	1	0.247	0.267	
50-4-2	9	0.249	0.294	
50-8-1	3	0.242	0.264	0.221
50-8-2	17	0.247	0.318	0.294
50-9-1	17	0.241	0.306	
50-9-2	22	0.247	0.349	

additional polishing of the core surfaces was required.) The MTO decided to investigate and attended at MNA to review its test results and raw data on file.

19. The MTO discovered that some of the AVS reports submitted by Gottardo to the CA and marked as “acceptable” were noted as “unacceptable” on the original AVS reports in the files of MNA (for lots 50-3, 50-6 and 50-7). The test results had been altered prior to submission to the CA office. The MTO pursued this issue directly with Gottardo, as MNA’s reports on file were not altered.
20. The MTO decided to review the underlying laboratory worksheets to check the calculations against the raw data. Perera provided the MTO with copies of the AVS reports and worksheets for all relevant samples.
21. The MTO identified irregularities with the recording of the raw data on some of the worksheets. In particular, the results for air voids intercepted for lots 50-4, 50-8 and 50-9 appeared to have been altered.
22. In all cases, the alteration was such that the first digit of the air voids intercepted had been increased by one; for example, from 19 to 29, or from 23 to 33. This number has the most impact on the spacing factor; increasing the number of voids intercepted reduces the spacing factor.
23. Perera reported the spacing factor calculated based on the altered data on the AVS reports. Those reports state “Test Results meet the MTO and CSA A23.1-00 Specifications.”
24. The number of data altered on each worksheet and the impact on the calculated spacing factor reported on the AVS reports was as follows [see chart above].
25. On or about November 10, 2008, two members of the forensic investigation team of the Ontario Internal Audit Division, accompanied by the MTO’s QA engineer, attended at MNA.
26. They interviewed MNA’s laboratory employees, including Perera and Zhang. They confirmed that the information on the worksheets had been altered. Initially, Perera denied responsibility for making changes to the worksheets.
27. Subsequent to the interview, Perera admitted to T. Kopp, of the forensic investigation team, that she personally made the changes to the worksheets.
28. Perera also admitted to PEO that she altered the data for the air voids intercepted on the worksheets. She also stated that:
 - The samples were defectively polished;
 - MNA’s mechanical polishing equipment was broken and appropriate sanding papers for manual polishing were not available in the laboratory;

- Poorly polished samples make the air voids difficult to read;
 - The operator expressed an opinion that inability to read the air voids makes the spacing factor higher;
 - She used her reasonable judgment to alter the air voids intercepted data;
 - Her alterations were an approximation; and
 - She did not gain any personal profit or benefit.
29. Normal laboratory protocol if an error has been made in data recording is to strike out the number, record the correct number and initial the change. Perera did not do so for any of the changes she made to the worksheets.
30. Moreover, she did not make any notation on the face of the corresponding AVS reports that she had approximated the underlying data for the spacing factor, or that polishing and/or testing of samples was defective.
31. Further, Perera did not order that the samples be re-polished and retested.

Impact of the altered AVS test results

32. The altered data on the worksheets was used to generate the results for spacing factor, which results were reported to the MTO on the AVS reports.
33. The AVS test results are a measure of “value for money” and do not present issues pertaining to structural integrity. The concrete for which the data was altered continued to be placed in the project. If the samples did not in fact meet the MTO’s criteria, concrete placed in bridge piers and abutments of bridges could require preventive maintenance earlier in its life than normally expected.
34. On or about November 21, 2008, MTO notified MNA that it had been removed from the list of qualified laboratories for testing of concrete on MTO contracts as a result of manipulation of AVS results on MTO Contract 2007-2264.
35. MTO filed a formal complaint of professional misconduct against MNA with the CCIL.

MNA resigned from membership in the CCIL while under investigation.

Admissions of professional misconduct

36. Perera admits that her actions and conduct in this matter constitute professional misconduct as defined under the *Professional Engineers Act*, s. 28(2)(b), and Regulation 941, s. 72(2), and specifically as follows:
- (d) that she failed to make responsible provision for complying with applicable statutes, regulations, standards, codes, by-laws and rules in connection with work being undertaken by or under her responsibility;
 - (h) that she undertook work she was not competent to perform by virtue of her training and experience; and
 - (j) that she engaged in conduct relevant to the practice of professional engineering that, having regard to all the circumstances, would reasonably be regarded by the engineering profession as disgraceful, dishonourable or unprofessional.
37. A hearing in this matter against MNA and Balendran was heard before the Discipline Committee of PEO on September 14, 2011. MNA was found guilty of professional misconduct as defined by the *Professional Engineers Act*, s. 28(2)(b), and Regulation 941, s. 72(2)(d), and a penalty was imposed against MNA. Balendran gave an undertaking to supervise Perera for one year or such lesser period of time she is employed by MNA.
38. Perera has had independent legal advice or has had the opportunity to obtain independent legal advice with respect to her admissions set out above.

PLEA BY MEMBER

The association filed a written plea inquiry that was affirmatively answered by Perera and signed by her on February 9, 2012. During the hearing, the panel conducted a plea inquiry. Perera admitted to the allegations as set out in the Agreed Statement of Facts. The panel is satisfied that Perera’s admission was voluntary, informed and unequivocal. Perera previously had legal representation, and continued to have the opportunity to obtain inde-

pendent legal advice with respect to the Agreed Statement of Facts.

DECISION

The panel considered the Agreed Statement of Facts and found Perera guilty of professional misconduct as defined in s. 28(2)(b) of the act and s. 72(2) of Regulation 941, and in particular:

- (d) that she failed to make responsible provisions for complying with applicable statutes, regulations, standards, codes, by-laws and rules in connection with work being undertaken by or under her responsibility; and
- (j) that she engaged in conduct relevant to the practice of professional engineering that, having regard to all the circumstances, would reasonably be regarded by the engineering profession as unprofessional.

REASONS FOR DECISION

The Agreed Statement of Facts identified the circumstances leading up to Perera's alleged misconduct, including but not limited to: (1) defective samples; (2) broken polishing equipment; (3) difficulty reading the air voids; and (4) the operator's opinion that inability to read the air voids made the spacing factor higher. Under these circumstances, Perera stated that she used "her reasonable judgment" to approximate and alter the "air voids intercepted" data. She failed to strike out the altered number, record the correct number, or initial the change on the worksheets; neither did she make any such notation on the corresponding AVS reports. She could have ordered that the samples be re-polished and retested which, for whatever reasons, was not done. The altered test results and reports were submitted to the contract administrator's office. When she was initially confronted by the Ontario Internal Audit Division and the quality assurance engineer from the Ministry of Transportation Ontario, she confirmed that the data had been altered, but denied that she was the one who had made the alteration. She later admitted to having made the changes to the worksheets. The panel accepted and relied on the Agreed Statement of Facts. On the basis of the facts set out in the Agreed Statement of Facts, the panel

found that the conduct of Perera in respect of the alterations constituted unprofessional conduct under the act.

Perera agreed to the allegations that she undertook work she was not competent to perform, as well as "disgraceful" or "dishonourable" conduct. The panel considered the facts contained in the Agreed Statement of Facts and did not find a factual basis to support those allegations. The association argued that, by altering the data and the AVS test results, Perera was not competent to perform the task. The panel rejected this argument. Section 72(2)(h) of Regulation 941 is clear that competence is assessed based on training and experience. Neither party led evidence as to Perera's training or experience (or lack thereof) in relation to the AVS test. Therefore, there was no factual basis on which the panel could conclude that Perera undertook work she was not competent to perform by virtue of training and experience.

Furthermore, there is no evidentiary basis on which the panel could find that Perera's conduct was also disgraceful or dishonourable. The only admissible evidence is contained in the Agreed Statement of Facts. In order for the panel to find disgraceful or dishonourable conduct, more admissible evidence would have been required. The panel emphasizes "admissible" evidence here because many alleged facts were made in the submissions that were beyond the four corners of the Agreed Statement of Facts and were not properly tendered before the panel. They could not, and did not, form the evidentiary basis for the panel's consideration in this proceeding. There is neither allegation nor evidence of fraudulent intent. Perera did not gain any personal profit or benefit. Based on the admissible evidence in this proceeding, the panel finds that the act by Perera was a temporary lapse of judgment, which was unprofessional, but was not of such a degree that should be considered disgraceful or dishonourable.

PENALTY SUBMISSIONS

The association filed a Joint Submission on Penalty dated November 1, 2011, signed by the parties, which provides as follows:

1. Perera shall be reprimanded and that the fact of the reprimand will be recorded on the register;
2. Perera's licence shall be suspended for a period of two months;
3. It shall be a term and condition of the licence of Perera that she will successfully complete the PPE examination within one year of the date of the hearing;
4. It shall be a restriction on the licence of Perera requiring her to engage in the practice of professional engineering only under the personal supervision and direction of a member for a period of one year following her return to practice after the suspension is discharged;
5. The order of the Discipline Committee suspending Perera's licence shall be published in summary, together with the name of the member, pursuant to s. 28(4)(i) of the *Professional Engineers Act*; and
6. There shall be no order with respect to costs.

Perera has had independent legal advice, or has had the opportunity to obtain independent legal advice, with respect to her agreement to the penalty set out above.

The association submitted that the above penalty was appropriate having regard to the purposes of: (1) protection of the public; (2) specific deterrence to the member; (3) general deterrence to the membership at large; and (4) remediation of the member back to the practice of professional engineering.

The association urged the panel to consider the seriousness of Perera's conduct in at least two respects: (1) her altered data was relied on by the government to determine the long-term durability of the highway concrete; and (2) Perera did not note her alterations on the worksheets.

The association further urged the panel to take into account the aggravating factors, including the facts that: (1) Perera made numerous alterations; (2) she signed the report as a P.Eng.; and (3) she initially denied the misconduct.

In the course of the oral submissions during the hearing, the association acknowledged that, despite paragraph 5 of the Joint Submission on Penalty, s. 28(4)(i) of the act does not apply to provide the panel with discretion as to whether to order publication in summary or in detail in cases where a licence is suspended or revoked. Instead, s. 28(5) applies under which the panel "shall cause" the order revoking or suspending a licence to be published in the official publication of the association with or without the reasons. The parties agreed to leave it in the discretion of the panel to decide whether to publish with or without reasons.

During the penalty stage of the hearing, Perera requested a less severe penalty than set out in the Joint Submission on Penalty. She said that she had had an unblemished professional record in her home country and Canada until now and that, since the incident, she had been in agony and distress. She regretted her actions and indicated that, had she known about the significance of the breach of her conduct, she would have acted differently, including obtaining accurate and reliable test results at her own expense. Perera was visibly upset and remorseful during the hearing. The panel believed that her remorse was genuine and heartfelt.

In reply, the association urged the panel to hold the parties to their agreement as to penalty. After deliberation, the panel indicated to the parties that it intended to depart from the Joint Submission on Penalty by eliminating the proposed two-month licence suspension.

The association sought an opportunity to make submissions to the intended penalty. The panel agreed and invited the parties to make written submissions on penalty according to a stipulated timetable, the details of which are set out in the Interim Direction and Proposal issued by the panel and dated February 27, 2012.

The parties and independent legal counsel filed written submissions in due course. On April 5, 2012, Perera advised the panel in writing that she affirmed the Joint Submission on Penalty.

The panel notes here, again, that some statements of "facts" were made during oral and written submissions beyond the facts stipulated in the Agreed Statement of Facts. The panel finds that such statements are not admissible as, among other things, they were contentious and have not been made by a witness under oath. In the end, the panel reached a penalty decision without taking those statements into account.

PENALTY DECISION

After reviewing all of the written submissions, the panel accepts the Joint Submission on Penalty as falling within the reasonable range in the circumstances, and orders that:

1. Perera receive a reprimand, and the fact of the reprimand be recorded on the register of PEO until the penalty provisions in paragraphs 2-4 below have been complied with.
2. Perera's licence be suspended for two months, taking effect from August 14, 2012 to October 13, 2012.
3. Perera write and pass the professional practice exam set by PEO within one year from April 16, 2012. If Perera fails to pass the professional practice exam, PEO will bring this matter to the Discipline Committee for further penalty.
4. A condition and limitation be imposed on Perera's licence so that she can only engage in the practice of professional engineering under the personal supervision and direction of a licensed professional engineer. This condition and limitation will be in effect for one year immediately following her return to practice after the suspension is discharged.
5. The order of the Discipline Committee suspending Perera's licence be published with reasons, pursuant to s. 28(5) of the act.
6. There shall be no order with respect to costs.

REASONS FOR THE PENALTY DECISION

The panel received extensive advice and submissions from independent legal counsel and the association, respectively, on the test that a PEO discipline panel should apply if and when it intends to depart from a penalty agreement. They suggested that the principles applied in criminal law with respect to joint penalty submissions should be applicable in the penalty stage of PEO discipline hearings, as has been the case in respect of Law Society discipline hearings. See for example, *Law Society of Upper Canada v. Cooper* [2009] L.S.D.D. No. 81. Joint penalty agreements are a frequent phenomenon

in criminal and professional discipline proceedings. The Ontario Court of Appeal set out the test and policy considerations in *R. v. Jason Carmen Cerasuolo*, 2001 CanLII 24172 (Ont. C.A.) as follows:

[8] This court has repeatedly held that trial judges should not reject joint submissions unless the joint submission is contrary to the public interest and the sentence would bring the administration of justice into disrepute: e.g. *R. v. Dorsey* 1999 CanLII 3759 (ON CA), (1999), 123 O.A.C. 342 at 345. This is a high threshold and is intended to foster confidence in an accused, who has given up his right to a trial, that the joint submission he obtained in return for a plea of guilty will be respected by the sentencing judge.

[9] The Crown and the defence bar have cooperated in fostering an atmosphere where the parties are encouraged to discuss the issues in a criminal trial with a view to shortening the trial process. This includes bringing issues to a final resolution through plea bargaining. This laudable initiative cannot succeed unless the accused has some assurance that the trial judge will in most instances honour agreements entered into by the Crown. While we cannot over-emphasize that these agreements are not to fetter the independent evaluation of the sentences proposed, there is no interference with the judicial independence of the sentencing judge in requiring him or her to explain in what way a particular joint submission is contrary to the public interest and would bring the administration of justice into disrepute.

Similar policy interests exist in PEO discipline proceedings. In our view, where the parties choose to enter into a penalty agreement after discussions and negotiations, with full awareness of their respective rights or in the absence of duress, such agreement should not be disregarded unless the proposed penalty falls outside a range of penalties that is reasonable for the nature of the misconduct in the circumstances.

There were also written submissions on whether a panel intending to depart from a joint

submission on penalty should give parties an opportunity to make further submissions before passing the final penalty decision. Independent legal counsel highlighted a few cases suggesting that a party should be given an opportunity to make submissions to the court or tribunal if it intends to deviate from a joint submission and impose more severe penalties. The advice was that “it is not clear that the procedural rule should be applied equally whether the deviation from the jointly proposed penalty is ‘upward’ or ‘downward.’” The association submitted that the same procedural caution should apply whether the deviation is more or less severe than what the parties agree to, on the basis that the association is equally entitled to be heard and have its submissions given fair weight. After the submissions had been received by the panel and during the period when this decision was under reserve, the Ontario Court of Appeal released a decision on April 20, 2012 in *R. v. DeSousa*, 2012 ONCA 254 (CanLII) and stated that a trial judge should apply the same test (that is, whether the proposed penalty would bring the administration of justice into disrepute or would otherwise not be in the public interest) when deciding whether to depart from a joint submission on penalty, upward or downward. In light of this decision, the panel is of the view that, when a PEO discipline panel intends to depart from a joint submission on penalty, whether upward or downward, the best practice is to provide the parties with an opportunity to make submissions. In this proceeding, as set out above, the parties were invited to make submissions on the panel’s intended penalty.

As there is no admissible evidence of duress in this case, the key is to determine the reasonable range of penalties for the nature of misconduct by Perera. As stated above, based on the Agreed Statement of Facts, the panel concluded that Perera demonstrated a temporary lapse in judgment in altering the data and test results without proper notations on the worksheets. However, there was no factual or evidentiary basis on which the panel could conclude that she had any fraudulent intent or acted in bad faith.

The association forcefully argued during the hearing and in written submissions that the case of *PEO v. Campbell*, in which a 24-month licence suspension was imposed, sets the upside of the range applicable to this case and any sanction below is “within the range.” The panel rejected this argument. Very few PEO discipline proceedings share identical facts. However, the nature and degree of blameworthiness of the misconduct in prior PEO discipline proceedings could be instructive for the determination of the reasonable range of penalties in subsequent proceedings.

The nature and blameworthiness of the misconduct by Campbell, as found by the panel in that case, is much more serious and nefarious than that of Perera. The panel in *PEO v. Campbell* found that Campbell asked another person to falsify the test results and had the deliberate intention to mislead people about the status of the contract. He lied when confronted with the falsified test results. There was also a finding that he breached his fiduciary duty to his client. In the end, the panel found Campbell’s conduct was disgraceful, dishonourable and unprofessional.

In this case, the panel found that Perera was in a laboratory environment with defective samples and broken polishing equipment, resulting in inaccurate spacing factors. She attempted to rectify the situation by using what she said was her “reasonable judgment” in altering the results, but

failed to record the alterations on paper. *PEO v. Campbell* can easily be distinguished as there is no sufficient evidence in the Agreed Statement of Facts to suggest that Perera intended to mislead the MTO or others.

The association also urged the panel to consider *PEO v. Crozier*, one of the many sample cases summarized by independent legal counsel. In that case, according to the Agreed Statement of Facts therein and the evidence introduced during the hearing, Crozier was found to engage in professional misconduct for failing to maintain the standards expected of a reasonable and prudent practitioner and using the title “consulting engineers” without permission from PEO. Crozier’s conduct was described as a lapse of judgment. The panel in *PEO v. Crozier* accepted the parties’ Joint Submission on Penalty that included a two-month licence suspension.

In the result, the panel accepted the argument that *PEO v. Crozier* is relevant for the determination of the reasonable range of penalty in this case. Both cases deal with misconduct that resulted from a lapse of judgment and was found to be unprofessional, but not disgraceful or dishonourable. In light of *PEO v. Crozier*, the panel concluded that a two-month licence suspension falls within the reasonable range of penalties in this case, even though, arguably, it may represent the upper end of the range. Accordingly, the panel accepted the proposed penalty as agreed to between the parties.

Colin Cantlie, P.Eng., signed this Decision and Reasons for the decision as chair of the discipline panel on behalf of the members of the discipline panel: Santosh Gupta, P.Eng., Rebecca Huang, LLB, Phil Maka, P.Eng., and Patrick Quinn, P.Eng.

DECISION AND REASONS

In the matter of a hearing under the *Professional Engineers Act*, R.S.O. 1990, c. P.28; and in the matter of a complaint regarding the conduct of PETER J. FAMIGLIETTI, a former member of the Association of Professional Engineers of Ontario.

This matter came on for hearing before a panel of the Discipline Committee on August 27, 2012, at the Association of Professional Engineers of Ontario in Toronto, to hear and determine allegations against Peter J. Famiglietti (Famiglietti).

The panel waited until 10:00 a.m. before commencing the hearing in the event that Famiglietti was delayed. However, Famiglietti did not attend the hearing, nor was he represented by counsel. Counsel for the association presented an Affidavit of Service, indicating that Famiglietti was served with the Complaints Committee decision and the Statement of Allegations, by forwarding a signed copy of the said documents by ordinary mail on March 28, 2012, to his home address on record. Counsel advised that no response was received from Famiglietti.

Counsel for the association also presented a registrar’s certificate, indicating that Famiglietti was licensed as a professional engineer under the provisions of the *Professional Engineers Act* from December 12, 2005 to April 13, 2010. His licence was lapsed due to non-payment of annual fees. Further, Famiglietti never held a Certificate of Authorization (C of A) under the provisions of the *Professional Engineers Act*, and he has never been the professional engineer responsible for, or who supervised, the services provided that are within the practice of professional engineering on behalf of a Certificate of Authorization holder.

THE ALLEGATIONS

The Statement of Allegations presented by the counsel for the Association of Professional Engineers of Ontario (the association) included the following.

It is alleged that Peter J. Famiglietti is guilty of professional misconduct as defined in the *Professional Engineers Act* and Regulation 941, the particulars of which are as follows:

1. Famiglietti was a professional engineer licensed pursuant to the *Professional Engineers Act* from December 2005 until his licence was cancelled for non-payment of fees on April 13, 2010. The association has never issued Famiglietti a Certificate of Authorization.
2. The complainant was, at all material times, a plans examiner (plans examiner) for a city near Toronto, Ontario (the city).
3. In or about 2008, a home owner (the owner) retained a contractor to build a set of stairs for his house. The contractor advised that the owner did not need a building permit.

4. On July 18, 2008, a city building inspector (the inspector) discovered the stairs and advised the owner that he required a permit.
5. At some point prior to March 2010, the owner applied for a building permit by submitting to the city a hand-drawn diagram of the stairs. The diagram was rejected by the city clerk. A second submission was also rejected.
6. On or about March 16, 2010, the city issued the owner an Order to Comply, requiring him to obtain a building permit for the stairs.
7. On March 26, 2010, the owner submitted a diagram of the stairs dated December 18, 2009, which was signed and sealed by Famiglietti. The diagram contained measurements of certain areas of the structure, but substantially failed to provide the information necessary to assess the structure's compliance with the building code. Specifically, the diagram did not specify:
 - (a) foundation sizes for the landing;
 - (b) framing sizes for the landing;
 - (c) stair rise and run values;
 - (d) guardrail attachment information;
 - (e) post-attachment information for the guardrails;
 - (f) height of the guardrails;
 - (g) wood stair stringer attachment information; and
 - (h) size of the pickets.
8. In or about April 2010, the plans examiner called the owner to advise him of his concerns with the diagram.
9. In or about July 2010, the owner resubmitted Famiglietti's December 18, 2009 diagram with handwritten alterations to certain numerical measurements. The diagram was still unsatisfactory to the plans examiner, who then attempted to contact Famiglietti about his concerns. Despite leaving several messages for Famiglietti at his home telephone number, Famiglietti never returned the plan examiner's call.

10. On August 25, 2010, the plan examiner filed a complaint with the association.

Based on these facts, it is alleged that Famiglietti is guilty of professional misconduct as follows:

1. creating a drawing of a structure that substantially failed to provide the information necessary to assess the structure's compliance with the building code, amounting to professional misconduct as defined by sections 72(2)(a), (d) and (j) of Regulation 941;
2. providing engineering services to the public while not holding a C of A, contrary to section 12(2) of the *Professional Engineers Act*, amounting to professional misconduct as defined by section 72(2)(g) of Regulation 941;
3. undertaking work in civil engineering, a discipline in which Famiglietti has little or no training or experience, amounting to professional misconduct as defined by section 72(2)(h) of Regulation 941; and
4. failing to respond to reasonable enquiries about his work by the city plans examiner, amounting to professional misconduct as defined by section 72(2)(j) of Regulation 941.

PLEA BY MEMBER

The hearing proceeded in his absence and without representation from counsel on his behalf. There was no plea from, or on behalf of, Famiglietti.

PANEL JURISDICTION

Although Famiglietti is not currently licensed as a professional engineer in Ontario, the events in question occurred during the period he was licensed as an engineer. Section 22(1) of the *Professional Engineers Act* states that a member's licence may be cancelled for non-payment of fees, subject to the continuing jurisdiction of the association in certain circumstances:

- 22.(1) The Registrar may cancel a licence, certificate of authorization temporary licence, provisional licence or limited licence for non-payment of any fee prescribed by the regulations or the by-laws after giving the member or the holder of the certificate of authorization, temporary licence, provisional licence or limited licence at least two months' notice of the default and intention to cancel, subject to the continuing jurisdiction of the Association in respect of any disciplinary action arising out of the person's professional conduct while a member or holder.

Accordingly, this panel had jurisdiction to consider the matter and proceed with the hearing.

THE WITNESSES

Counsel for the association presented the inspector and the plans examiner, both employees of the city, as witnesses for the prosecution.

The inspector, while inspecting the adjacent property in July 2008, discovered the stairs and landing providing access to a deck on the second floor on the subject property. Further investigations confirmed that, whereas there was a permit for the decks, the stairs and landings had been built without a permit. The owner was requested to obtain a permit. An Order to Comply was issued on March 16, 2010, following rejection of the hand-drawn diagram submitted by the owner in support of the building permit.

On March 26, 2010, the owner submitted a diagram of the stairs dated December 18, 2009, which was signed and sealed by Famiglietti. The diagram contained measurements of certain areas of the structure, but substantially failed to provide the information necessary to assess the structure's compliance with the building code. This diagram was rejected by the city due to numerous deficiencies.

Subsequently, in July 2010, Famiglietti resubmitted the drawing with handwritten alterations to the dimensions of the stairs. Some of these alterations were fairly significant. The plans examiner tried to contact Famiglietti to seek clarification, but these calls were not returned.

DECISION

The panel, after having considered all of the information and evidence presented to it during the hearing, determines that the facts support a finding that Peter J. Famiglietti is guilty of professional misconduct due to the following:

1. creating a drawing of a structure that substantially failed to provide the information necessary to assess the structure's compliance with the building code, amounting to professional misconduct as defined by sections 72(2)(a), (d) and (j) of Regulation 941;
2. providing engineering services to the public while not holding a Certificate of Authorization, contrary to section 12(2) of the *Professional Engineers Act*, amounting to professional misconduct as defined by section 72(2)(g) of Regulation 941;
3. undertaking work in civil engineering, a discipline in which Famiglietti has little or no training or experience, amounting to professional misconduct as defined by section 72(2)(h) of Regulation 941; and
4. failing to respond to reasonable enquiries about his work by the plans examiner, amounting to professional misconduct as defined by section 72(2)(j) of Regulation 941.

REASONS FOR DECISION

The panel had serious concerns in relation to Famiglietti's conduct relating to his involvement in this matter.

The panel is also concerned about significant variations in the dimensions in two diagrams bearing his seal and signature for the same set of existing stairs. He either measured these incorrectly, or deliberately altered them to show compliance with the building code, after he had been advised of the deficiencies. This raises ethical questions.

Also, Famiglietti provided professional services to the general public without a valid Certificate of Authorization in contravention of the *Professional Engineers Act*.

From the evidence presented, it was clear that Famiglietti did not take responsibility for his actions by neglecting to respond to a legitimate request for information from building officials.

PENALTY DECISION

The panel has considered the submission from the counsel of the association, and orders as follows:

1. Whereas Famiglietti is not currently a member of the association and is entitled to seek reinstatement of his licence to practise as a professional engineer upon payment of outstanding fees, pursuant to section 22(2) of the *Professional Engineers Act*, upon compliance with the requirements of Article 51.1 of Regulation 941, there shall be an additional condition imposed requiring him to successfully complete the professional practice examination within two months of compliance of the requirements under Article 51.1 of Regulation 941, failing which his licence will be suspended for a further six months.
2. Pursuant to subsection 28(4)(k) of the *Professional Engineers Act* that the imposition of the penalty set out in Item 1 above shall be postponed until the reinstatement, if any, of Famiglietti's licence, at which time the penalty set out in Item 1 above shall be automatically imposed, such that it shall be a condition of the reinstated licence; and
3. Pursuant to subsection 28(4)(1) of the *Professional Engineers Act* that the findings and the order of the Discipline Committee shall be published in detail, including Famiglietti's name, in the official publication of the association.

REASONS FOR PENALTY

In consideration of the penalty relating to the conduct of Famiglietti, the panel considered the following:

- (a) protection of the public;
- (b) maintenance of professional standards;
- (c) maintenance of public confidence in the ability of the profession to regulate itself;
- (d) general deterrence; and
- (e) specific deterrence.

The panel viewed the conduct of Famiglietti as irresponsible, reprehensible and unprofessional, by providing services in a discipline in which he was not competent, which put the public's welfare and safety at risk.

The provision of engineering services without a valid Certificate of Authorization is a serious contravention of the *Professional Engineers Act* and cannot be taken lightly. It does not matter if these services are provided on an informal basis to a friend or without cost. A licensed engineer is still obligated to adhere to the professional standards expected by the profession and the public at large.

The penalty imposed herein is also intended to serve as a warning to licensed professional engineers who may be inclined to such misconduct, and also as a reminder of their obligations as licensed professional engineers.

The penalty imposed by the panel is also intended to serve as a reminder to Famiglietti of his professional and ethical responsibilities and obligations should he choose to return to the profession by seeking reinstatement of licence.

Under similar circumstances, an active member would have received a reprimand, which would have been registered. As Famiglietti is not currently a member of the engineering profession, a reprimand is not practical at this time.

Virendra Sahni, P.Eng., signed this Decision and Reasons as chair on behalf of the members of the discipline panel: Robert Dony, P.Eng., Nick Monsour, P.Eng., Sharon Reid, C.Tech, and Rakesh Shreewastav, P.Eng.

Note: This document has been revised from the original document to protect the identity of the witnesses.

NOTICE OF LICENCE REVOCATION ROBERT G. WOOD

On November 16, 2012, the professional engineering licence of Robert G. Wood was revoked pursuant to a November 15, 2010 order of the Discipline Committee. The order was issued following a finding of professional misconduct against Wood at a discipline hearing held on November 17, 2008 and March 3-5, 2009. Wood's licence was revoked because he failed to write and pass the professional practice examination and two technical examinations within the 24-month time frame prescribed by the Discipline Committee. Wood's licence had been suspended since November 16, 2011, pursuant to the same order of the Discipline Committee.



PUBLICATIONS ORDER FORM

	\$	No.	Total
The Professional Engineers Act, R.S.O. 1990, Chapter P.28	N/C		
Ontario Regulation 941/90.....	N/C		
Ontario Regulation 260/08.....	N/C		
By-law No. 1	N/C		
Practice Guidelines			
Acting as Contract Employees (2001).....	10.00		
Acting as Independent Contractors (2001).....	10.00		
Acting Under the Drainage Act (1988).....	10.00		
Acoustical Engineering Services in Land-Use Planning (1998).....	10.00		
Building Projects Using Manufacturer-Designed Systems & Components (1999).....	10.00		
Commissioning Work in Buildings (1992).....	10.00		
Communications Services (1993)	10.00		
Engineering Services to Municipalities (1986).....	10.00		
Environmental Site Assessment, Remediation & Management (1996).....	10.00		
General Review of Construction as Required by Ontario Building Code (2009).....	10.00		
Geotechnical Engineering Services (1993).....	10.00		
Guideline to Professional Engineering Practice (2012).....	10.00		
Human Rights in Professional Practice (2009).....	10.00		
Land Development/Redevelopment Engineering Services (1994).....	10.00		
Mechanical & Electrical Engineering Services in Buildings (1997).....	10.00		
Professional Engineer as an Expert Witness (2011).....	10.00		
Professional Engineer's Duty to Report (1991)	N/C		
Project Management Services (1991).....	10.00		
Reports on Mineral Properties (2002)	10.00		
Reports for Pre-Start Health and Safety Reviews (2001)	10.00		
Reviewing Work Prepared by Another Professional Engineer (2011).....	10.00		
Roads, Bridges & Associated Facilities (1995).....	10.00		
Selection of Engineering Services (1998).....	10.00		
Solid Waste Management (1993)	10.00		
Structural Engineering Services in Buildings (1995)	10.00		
Temporary Works (1993).....	10.00		
Transportation & Traffic Engineering (1994).....	10.00		
Use of Agreements Between Clients & Engineers (2000) (including sample agreement)	10.00		
Use of Computer Software Tools Affecting Public Safety & Welfare (1993)	10.00		
Use of the Professional Engineer's Seal (2008)	10.00		
Business Publications			
Agreement Between Prime Consultant & Sub-Consultant (1993) per package of 10.....	10.00		
Licensing Guide & Application for Licence (2007)	N/C		
Required Experience for Licensing in Ontario (2007)	N/C		

Fax to: 416-224-8168 or 800-268-0496
 Phone: 416-224-1100 or 800-339-3716
 Mail to: Professional Engineers Ontario
 40 Sheppard Ave. W., Suite 101
 Toronto, ON M2N 6K9
 Attn: Margaret Saldanha

Name _____

Shipping Address _____

City _____

Province _____

Postal Code _____

Tel _____

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Shipping and handling is included.
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Membership # _____

GLP ACADEMY PARTICIPANTS GET TO KNOW THE PEOPLE BEHIND THE PARTIES, PLATFORMS AND PORTFOLIOS

By Howard Brown and Kaitlynn Dodge

IT'S SAFE TO say that politics can seem like a topsy-turvy world to process-driven problem solvers like engineers.

In the world of public affairs, the best, most economical option isn't always chosen. The facts aren't always clear and, oftentimes, decision makers aren't aligned on exactly what the problem is that needs to be solved.

So how is one to navigate in an environment where things aren't black and white but instead perpetually grey? By remembering one important constant: People govern people.

Engineers who participated in the October 27, 2012, Eastern Region Government Liaison Program (GLP) academy and congress had an opportunity to see this first hand, by learning about the rich histories and perspectives held by those who are in elected office. They had an opportunity to learn that, indeed, those who govern us are people much like themselves.

The event's guest speakers gave participants a unique opportunity to learn about the people behind the parties, platforms and portfolios in their region, and to better understand how to engage with them effectively.

"Having good relationships is important," said Jeannette Chau, P.Eng., PEO's manager, student and government liaison programs, who spoke at the academy about PEO's GLP. "It is by fostering, nurturing and enhancing these relationships that we better understand what matters to decision makers and what implications certain issues have politically."

Understanding the personalities, perspectives and histories of elected officials is equally as important as facts and figures when it comes to pushing forward an agenda.

Guest speaker Steve Clark, MPP (Leeds-Grenville), PC municipal affairs critic and deputy

house leader, shared his political history with participants, providing insight into what motivates him to serve in public office. He reflected on how he was elected as Ontario's youngest mayor in 1982, at the age of 22, by running on an issue that proved to resonate with residents involving the collapse of an arena roof.

"Learning so much about who our local elected officials are as people and what drives them to serve really helped to bring the concept of government relations from theory into reality," said PEO Kingston Chapter GLP Chair Hafiz Bashir, P.Eng., who organized the event. "Now when we call our local members to invite them to events or to request a meeting, we have the context needed to foster a relationship and demonstrate that we are informed and interested in their priorities."

Other political guest speakers included Kingston and the Islands MP and Liberal Science and Technology Critic Ted Hsu, Stormont-Dundas-South Glengarry MPP and PC Consumer Services Critic Jim McDonnell, P.Eng., and Kingston City Councillor Dorothy Hector, P.Eng. (licensed in New Brunswick), who provided insight into why they decided to enter politics and what drives them in office. Each speaker also addressed how engineers can build better relationships with their level of government and provided their thoughts and suggestions.

After the speeches concluded, engineers from across the region updated one another on activities and participated in a congress to plan government relations activities for the year ahead.

What was clear was that no matter the particular issue, sustaining a long-term, authentic relationship with local elected representatives is the only constant in an often unpredictable political climate.

The *Kingston Whig-Standard* published coverage of the event on October 29 (www.thewhig.com/2012/10/29/politicians-open-to-more-input-from-engineers). Σ

Howard Brown is president and Kaitlynn Dodge is account manager, Brown & Cohen Communications & Public Affairs Inc.

Shedding new light on the nature and
inevitability of **RISK**





BY MICHAEL MASTROMATTEO

Severe weather is but one of the issues driving the engineering profession to step up its emphasis on identifying hazards and managing risk. Engineers are also being called on to determine the safety and durability of aging infrastructure.



Recent spate of structural and infrastructure failure and extensive damage from natural disasters, ranging from building collapses to Hurricane Sandy, present some troubling questions for professional engineers.

Beginning with reports of falling window glass from high-rise condominium towers in Toronto, and including such high-profile fatal accidents as the partial collapse of the Algo Centre Mall in Elliot Lake, and the stage tower collapse at an outdoor music concert at Downsview Park in Toronto this past summer, the public is starting to wonder just how safe and well maintained some of Ontario's infrastructure is.

Hurricane Katrina in August 2005 and other severe weather events closer to home also challenge engineers. In the Hurricane Katrina example, US engineers later determined that much of the death and destruction could have been prevented by design improvements and regular maintenance of levees and floodwalls in the New Orleans area.

In response to the recent Ontario structural collapses, PEO President Denis Dixon, P.Eng., FEC, has called for the creation of an Ontario provincial engineer with authority for the overall health of Ontario's engineered works, much like the provincial chief medical officer of health looks systemically at the health of Ontario's people. As Dixon points out in his proposal, responsibility for the safety of major engineering projects passes from engineer to owner once the projects are completed. The ongoing assessments of safety, reliability and remedial maintenance are left to each owner's discretion. Discussion of the concept with the Ontario government has been ongoing since the summer.

Meanwhile, Engineers Canada, the federation of Canada's provincial and territorial regulators, has for several years promoted an engineer's duty to accommodate climate change into infrastructure design. Its Public Infrastructure Engineering Vulnerability Commit-

tee (PIEVC) notes that engineers have a responsibility to prevent or minimize weather-related disruptions and reduce risks by designing, building and maintaining resilient infrastructure that can adapt to the impacts of a changing climate.

The PIEVC highlights the risk-management imperative by calling on the engineering profession to develop new design and operational practices to withstand changing climate conditions. A key element here is for engineers to augment historical data and consider updates to design, operation and maintenance codes, standards and practices when it comes to infrastructure durability.

BETTER ASSESSMENT TOOLS

Robert Tremblay, director of research for the Insurance Bureau of Canada, told *Engineering Dimensions* December 3 that professional engineers have been key contributors to the development of the bureau's municipal risk assessment tool that will help municipalities identify infrastructure vulnerabilities and better allocate improvement funds.

Tremblay also says Engineers Canada's PIEVC work was "the inspiration" for the development of new and updated risk-assessment tools, which over the last two decades have been embraced by municipalities and insurance industry officials to better protect communities from severe weather incidents.

"Climate is no longer stable and it creates a problem" Tremblay says. "Infrastructure is under-designed for new climatic realities and so the question is, Where are we heading? What should engineers plan for? Rain intensity, for one, has changed and we have to adjust our designs to increase the resiliency of communities."

Tremblay adds that engineers remain key players in the risk-management area because they are the designers and sometimes the operators of much of the key infrastructure. In addition, engineers develop models based on the best available data. "Without access to good data, it's difficult to develop a good risk-assessment tool," Tremblay says.

Lawyers have also begun to weigh in on the engineering profession's potential liability vis-à-vis severe weather. In an August 2012 presentation to engineering societies,



Toronto-based attorney Patricia Koval, LLP, emphasized that "... if infrastructure is not adapted to these changes and events, property damage and/or personal injury is almost certain to occur. This has potentially serious ramifications for design professionals, including engineers...The issue of potential legal liability for failing to adapt infrastructure to climate change-related risk has become a key issue over the past year. Laws, building codes and standards are beginning to be amended to take into account the potential impact of climate change on infrastructure assets, but significant changes are still some time away" (see "Climate change risk: Is liability lurking for professional engineers?," p. 27).

Given the increased public scrutiny attached to failures, collapses and natural disasters, engineers are being called on more than ever to bring their problem-solving, analytical mindset to the study of risk management, prevention and hazard identification.

But risk management for engineers isn't a new topic, nor has its significance been lost on the wider profession.

When *Engineering Dimensions* last handled this topic (see "Relief, mitigation, prevention: P.Engs and public safety," May/June 2006, p. 60), the messages were that individual engineers have a responsibility for worker and public safety, and that the profession is steadily advancing its knowledge and tools for measuring risk, which resources should be made available not only to current practitioners, but also to students about to enter the profession.

The same year, the Association of Professional Engineers and Geoscientists of Alberta published the *Guideline for Management of Risk in Professional Practice*. Meanwhile in a document by the Association of Professional Engineers and Geoscientists of British Columbia, it states: "It is not the professional engineer's responsibility to determine what is an acceptable level of risk...such determinations need to be established by government after considering a range of societal values."

As a regulator, PEO doesn't proactively identify risk and determine whether new standards are needed to deal with it. Instead, PEO's Professional Standards Committee looks at issues as they arise, decides whether a practice standard or guideline is needed and, if needed, strikes a sub-committee of appropriate practitioners to draft a standard or guideline, which is circulated for comment before being finalized.

At the national level, Engineers Canada recently distributed a "model guide" for risk management for professional engineers. Completed in August 2012, the model guide was written by the Practice Commit-



tee of the Canadian Engineering Qualifications Board (CEQB). The lead author was Malcolm Symonds, P.Eng., FEC, vice chair of the CEQB and a licensed engineer in Manitoba.

The model guide was circulated among constituent member associations of Engineers Canada and received generally positive feedback. It will be up to each individual association to decide how or whether to use it to guide its licence holders.

The model guide posits risk management as an area of knowledge with which all engineers should be familiar. “The degree of familiarity, or depth of knowledge, will depend on the specific engineering discipline and the nature of the field of practice,” the 2012 guide states. “Nevertheless, a constant awareness of the risk management process, and some degree of competence in its application, are essential for all engineers.”

INHERENT LEVEL OF RISK

The guide goes on to suggest that engineering work requires assessing and managing risk, identifying hazards, and analyzing consequences and probabilities: “Simply put, the practice of engineering carries with it an inherent level of risk that engineers must seek to understand and manage.”

The Engineers Canada model guide also says that in addition to determining the extent of risk in a given situation or project, engineers must strive to manage it. “This is arguably the most important step in the process as responsibility has now been taken for assuming the risk and preventing any undesirable incident from occurring. A key engineering tool employed in this stage is a management system appropriate for the risks being managed. Once a risk is accepted, it does not go away; it is there waiting for an opportunity to happen unless the management system is actively monitoring engineering and company operations for concerns and taking proactive actions to correct or mitigate potential problems.”

In a November interview, Symonds said risk is especially relevant to engineers because of its integral association with the design process. Symonds also favours an expansion of risk management-type programs and courses for undergraduate engineering students. “I am interested in risk because it is integral to the design process,” Symonds says. “Every decision that is made has to be weighed against the probability of success for the design and its influence on the performance, reliability, economics and, finally, safety of the product or process. In this way, the company and ultimately the public, society and the environment are protected.”

Symonds adds, however, that engineers tend to have a more nuanced understanding of hazard and risk than the general public. “Engineers have a

different view because they have a better understanding of the technical issues surrounding an issue and the influence that material, operation, aging and factors of safety have on the ultimate viability of a product or process,” he says. “They also do not have the same emotional issues that result from fear or ignorance. Having said that, engineers should also try to understand the public issues and endeavour to include the reaction into the design.”

The Engineers Canada model guide is indebted to a 2006 paper, *Risk Management: An Area of Knowledge for all Engineers*, co-authored by Paul Amyotte, PhD, P.Eng., FEC, of Dalhousie University, and Doug McCutcheon, PhD, P.Eng., of the University of Alberta.

In addition to recommending that the engineering profession embrace risk management as a more cogent area of study, the Amyotte-McCutcheon paper concluded that there is a strong legal mandate for good risk-management practices in engineering activities in Canada.

“The regulatory regime in Canada is changing to some degree and is different from the United States and Europe,” the authors write. “This latter point is especially important for those engineering firms that practice globally. The bottom line concerning Canada’s risk management practices is that these will definitely not be viewed as ‘voluntary’ by the courts should a loss producing event occur. Due diligence will be expected by the courts, and this means engaging in best-practice, state-of-the-art risk management activities as the only accepted way to do business. Such activities would include basic concepts with which engineers are quite familiar—codes, standards, and management systems.”

As a professor of chemical engineering, Amyotte has long focused his research on providing engineering methodologies for advancing

industrial safety. He is heartened by the fact that risk management appears to be pervading the engineering consciousness.

“I think that the ‘high-hazard industries’ have always been aware of the hazards and risks they face. But recent events with infrastructure issues have increased awareness of the need for effective risk management in other engineering sectors,” he told *Engineering Dimensions*.

MOVE IN THE RIGHT DIRECTION

This new awareness is also translating into greater emphasis on safety and risk study at the undergraduate level. The engineering faculty at the University of Alberta, for example, is one of the few places in Canada offering a safety and risk program component. Since 1988, it has offered its unique engineering safety and risk management program (ESRM), which focuses on applying industrial safety and loss/risk-management strategies to continuously reduce risk exposure for people, the environment, facilities/assets and production. It is also considered a pioneering effort to introduce industrial safety and risk management as a core competency for senior engineering students.

John Cocchio, P.Eng. (Alberta and Ontario), is an industrial professor in the ESRM program. Along with program chair Gordon Winkel, P.Eng. (Alberta), he believes it’s key to develop a risk-management ethos early in an engineer’s formation.

“Engineering professionals should have risk management engrained in what they do, and thus risk management will be reflected in all their undertakings, rather than a continual or periodic reminder that ‘you need to consider giving some priority to safety and risk management in your project,’” Cocchio says. “We believe there is a need for professional development in risk management. Our first opportunity is to reach all engineering students prior to graduation, and our second opportunity is to develop and offer a graduate engineering program that meets the needs identified by industry and by engineering professionals themselves.”

Amyotte also believes the move to emphasize risk studies in engineering undergraduate education bodes well for the future. “The recent move by the Canadian Engineering Accreditation Board to emphasize graduate attributes relating to safety and risk management is a positive move in the right direction,” he says. “My own students at Dalhousie who have been on co-op work terms in industry absolutely get it. They have seen the practice of process safety and risk management in industry and they understand the importance of teaching these subjects at the undergraduate level.”

Another organization keen to promote health and safety education is Minerva Canada Safety Management Education Inc. A not-for-profit corporation comprising volunteers, engineers and safety professionals, Minerva has developed over 20 engineering modules to assist professors in teaching best practices in health, safety and risk management, which



have been endorsed by the national deans of engineering and applied science (see “Educating future engineers about health and safety,” p. 48).

Veteran engineers, however, also appear to be focusing on risk management as a way to assure the public that the engineering profession stands ready to safeguard crucial infrastructure. Gerry Mulhern, P.Eng., executive director, Ontario Concrete Pipe Association (OCPA), is committed to the profession’s due diligence mandate. As a representative of the concrete pipe industry, Mulhern is leading a campaign to persuade Ontario’s transportation ministry to complete a more thorough inventory of the health and safety of the province’s bridges, culverts and other buried infrastructure.

He is especially concerned about reports of sinkholes and culvert-related road and bridge failures in Ontario. In 2006, an 18-year-old Sudbury-area woman was killed after driving her car into a sinkhole. Although the incident generated some brief debate on the safety of Ontario roadways, it quickly disappeared from the public consciousness.

It has resurfaced, however, with the September 2012 road collapse on Highway 174 near Ottawa, in which a motorist’s vehicle completely disappeared below the road surface. The apparent cause of the sinkhole was corrosion of a three-metre steel pipe under the roadway, which led to erosion of the nearby subsoil and the eventual cave-in. Luckily, the motorist survived the ordeal.

Mulhern says the Ottawa sinkhole should serve as a wakeup call for municipalities across the province, especially in view of news that the damaged steel pipe had been inspected in 2011, and was identified as in need of renewal.

Mulhern and other officials with the OCPA have twice met with Ontario Transportation and Infrastructure Minister Bob Chiarelli, to discuss the ministry’s new culvert inventory system. The ministry is now collecting data that will be used to monitor pipe performance and other features. The results obtained will assist in refining culvert practices and standards in design, construction and maintenance.

According to a 2009 Ontario Auditor General report on bridge inspection and maintenance, there is a lack of legislation requiring municipalities to comply with the bridge inspection regime demanded of bridges under provincial



authority. As each municipality is responsible for bridges in its own jurisdiction, there is no provincial body with authority over municipal compliance with bridge safety. As well, there is no central database on the number of municipal bridges and their overall condition.

“My position on risk is that a professional engineer can do four things with risk,” Mulhern says. “They can avoid it, they can transfer it, they can mitigate it, or they can accept it. I don’t think enough engineers spend enough time thinking about it and, too often, they are accepting it because they are working for a municipality or a consultant who is actually calling the shots.”

Mulhern says the sinkhole incidents raise the issue of risk management being subordinated to budgetary considerations in some municipalities.

DELAYING DECISIONS FOR BUDGET REASONS?

“The key point has to be that public safety is paramount and that an engineer’s bridge inspection report, including remedial actions and timing of remedial actions, should not be influenced by the availability or non-availability of funds,” he said.

Mulhern recommends a detailed program to reduce risk and ensure the safety of Ontario’s buried infrastructure. The plan includes asset management, dedicated funding toward infrastructure renewal, creation of a provincial database for bridges and culverts (including a history of specific bridge inspections) and improvements to public transportation and highway legislation. Such legislative amendments would give the province authority to enforce bridge inspection requirements at the municipal level.

Lastly, Mulhern believes safety would be enhanced by encouraging the independence of engineers and bridge inspectors. “Bridge engineers and bridge inspectors should be allowed to work independently and objectively,” Mulhern says. “The recommendations should not be primarily based on financial considerations. Public safety should be paramount.”

AWARENESS SPREADING

Despite Mulhern’s concerns about budgetary considerations possibly trumping safety issues, it appears that, in general, risk-management concepts and the extension of safety parameters are spreading, and that individual provincial regulators are taking note.

“I am obviously biased, but to me, risk management is at the very core of engineering,” says Amyotte. “Engineers Nova Scotia has launched an excellent series of continuing professional development events aimed at increasing awareness of various aspects of safety in engineering practice.”

Cocchio has suggested that engineers continue to play a key role in developing and enhancing safety-related regulations, including the updating of codes. “Professional engineers should be and need to be contributing stakeholders in the development of new codes and standards; however, it should go beyond that,” he says. “It is our professional ethics that should drive us to identify the risks, and to develop the appropriate risk-management strategies to manage the residual risk. It is part of this process that may include influencing the development of government regulations as needed.”

In addition, climate change and severe weather incidents seem to be accelerating the process, bringing some impetus to harmonizing standards for safety across jurisdictions and elevating the priority of risk management in public spending allocations.

“While it is generally accepted that there is climate change, the nature and severity of this issue is less clear,” says Symonds. “In some ways we are reacting to events as they happen. Hurricane Sandy will have a huge impact on the definition of infrastructure design and renewal. The issue of piecemeal safety/building standards across various jurisdictions will always exist due to parochial reactions to political and fiscal issues.” Σ

BY VIC PAKALNIS, MENG, MBA, P.ENG.



EDUCATING FUTURE ENGINEERS ABOUT HEALTH SAFETY

ONE OF THE FUNDAMENTAL REASONS that the engineering profession is regulated is to protect public safety. When professional engineers design bridges, tunnels, buildings or any structure using engineering principles, the public should be assured that those structures are safe.

This begins with how our future engineers are educated about health and safety. The Canadian Engineering Accreditation Board (CEAB) is tasked with establishing criteria that all engineering schools in Canada must meet, including those linked to health and safety. The following attributes are expected of engineering graduates with respect to health and safety (as extracted from the CEAB document):

1. Design—"ability to design solutions...with appropriate attention to health and safety risks..."
2. Professionalism—"...roles and responsibilities of professional engineers in society..."
3. Impact of engineering on society—"...understand implications related to social, health and safety, legal and economic aspects."
4. Economics and project management—"...ability to incorporate economics and business practices with risk and change management."

5. Ethics and equity—"...ethical obligation to health and safety..."

Queen's University, for instance, has a fourth-year course entitled Occupational Health and Safety in Mining Practice. The three dimensions explored in the course are health and safety technology, regulatory requirements, and principles of safety management. The mining engineering discipline, however, is not the model used in most engineering disciplines. Safety and risk management might be addressed in design courses in civil engineering, or process safety engineering may only be a module in chemical engineering.

TEACHING HEALTH AND SAFETY

While the CEAB establishes the criteria, each university's engineering faculty decides how it will teach health- and safety-related subject matter—

whether it is covered as a stand-alone course or integrated into various courses.

Having served as a general visitor and a program visitor on five CEAB visits to various Ontario universities in the past decade, it's clear the subject of health and safety is dealt with in very different ways and, in some institutions, in quite a cursory manner. Institutions are required to be role models for managing occupational health and safety in classrooms and labs. Serious injuries and lost-time injuries are documented as indicators of compliance and whether a safety culture exists. Thankfully, most engineering faculties outperform their colleagues in other professional schools like medicine, arts and science. And that's how it should be. However, the role of the CEAB is to be a check on engineering programs—to ensure engineering students are properly prepared for their vocations as professional engineers. If compliance issues arise, these are quickly addressed and corrective measures are undertaken.

MINERVA'S BEGINNINGS

Some 20 years ago, a group of volunteers, engineers and safety professionals formed to promote management occupational health and safety education among Canada's future leaders. Minerva Canada Safety Management Education Inc. was incorporated as a not-for-profit corporation in 1997. It targets educators of tomorrow's business and engineering leaders, both at colleges and universities. As the goddess of wisdom, Minerva is an apt icon for this unique organization's name. Funding comes mainly from industry—Imperial Oil, Dupont, GE, Bruce Power, Nova Chemicals, Shell Canada, Trimac Transportation, Nexen, Canada Post, General Motors Canada and the Workplace Safety and Insurance Board—and its board of directors consists of volunteers from industry, government, academe and various safety organizations.

Minerva has created over 20 business case studies that are available free of charge to business and engineering schools (www.safetymanagementeducation.com) but its most ambitious task to date is the development of over 20 engineering modules to be inserted in engineering curricula as engineering professors see fit. To assist engineering professors in teaching health, safety and risk management, Minerva Canada has sponsored Summer Institutes since 2004, where engineering professors can be taught best practices in teaching safety and risk management. They are provided with teaching materials, and there are speakers from industry, government and academe, and health and safety associations. Over 100 professors from across Canada have attended these sessions.

Through a partnership with MITACS, a national, not-for-profit research organization, and its industry partners, Minerva developed 10 modules in 2012, and a further 12 modules will be developed in 2013. In a meeting of the national deans of engineering and applied science in Edmonton

on November 9, 2012, the deans endorsed Minerva's work and suggested such additional improvements as making the modules available in French as well as English, and the addition of modules addressing bio-risks. The list of core and elective modules will grow over the years as new technology introduces new hazards and as new presentation and engineering strategies are introduced.

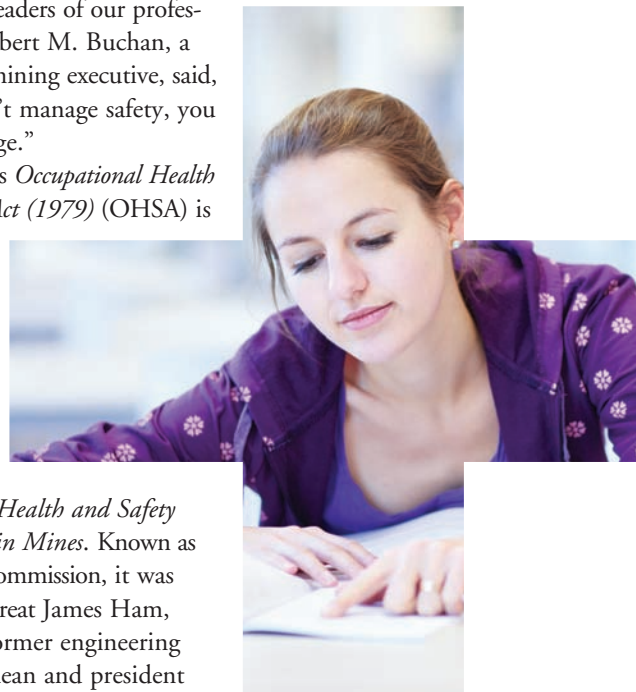
EXPERIENCE REQUIRED

While industry leaders recognize that managing safety is a core competency, it is difficult to teach. It requires industrial experience to fully convey the principles and application of safety and risk management. Some instructors might have this and some might not. To bridge this potential gap, a partnership with industry, government and academe is required to develop the future leaders of our profession. As Robert M. Buchan, a legendary mining executive, said, "If you can't manage safety, you can't manage."

Ontario's *Occupational Health and Safety Act (1979)* (OHSA) is now over 30 years old. It had its root in the 1976 *Report of the Royal Commission on the Health and Safety of Workers in Mines*. Known as the Ham Commission, it was led by the great James Ham, P.Eng., a former engineering professor, dean and president of the University of Toronto.

He is arguably the father of occupational health and safety in Canada. His legacy in legislation such as the OHSA and in the safety management system he termed "the internal responsibility system," a strategy for health and safety oversight in workplaces, lives on as the best in the world from this author's vantage point.

We must ensure our engineering students are given every advantage in being able to design and manage safety and risk as they protect the public interest, ensure safe conditions for all workers, and set the benchmark for all engineering schools globally. Σ



AN OVERVIEW OF MINERVA'S ENGINEERING MODULES TO DATE:

YEAR	CORE	POTENTIAL ELECTIVE MODULES
1 (10 hours)	<p>Personal safety and responsibility:</p> <ul style="list-style-type: none"> • WHMIS (already a requirement of all universities) • Worksmart Campus (passport to safety, rights and responsibilities, safety management), covers the <i>OSH Act</i> • principles of hazard identification (through the context of electrical safety) • introduction to professional accountability • guest speakers 	<ul style="list-style-type: none"> • chemical safety • fire hazards • employee well-being and workplace mental health • electrical safety and hazardous energy • dangerous goods
2 (20 hours)	<p>Hazard and risk management basics:</p> <ul style="list-style-type: none"> • accidents/near misses investigation and reporting • codes, standards and regulations (general) • hazard and risk identification and risk assessment models • safety design, including design for safe maintenance • basics of auditing 	<ul style="list-style-type: none"> • machine guarding • ergonomics and hygiene • radiation safety • process safety 1 • codes and standards (specific) • toxicology, toxic reduction and emissions • confined space
3 (20 hours)	<p>Management systems and leadership:</p> <ul style="list-style-type: none"> • risk management and safe operating practices • accident prevention • managing health and safety (including some process safety) and management systems • due diligence • safety leadership, safety culture and change management • the business case for safety 	<ul style="list-style-type: none"> • nanotechnology • process safety 2 • robotics safety • ergonomics and work environment assessment • human factors design • environmental impact assessment tools • field considerations
4 (10 hours)	<p>Ethics, the public and the environment:</p> <ul style="list-style-type: none"> • safety programs, behaviour-based safety and responsible care • emergency preparedness • professional responsibility, accountability and liability • public and environmental responsibilities • capstone projects (final assessment rubric to be used as part of the capstone project requirements) 	<ul style="list-style-type: none"> • process safety 3 • emergency response, crisis and emergency management • conflict or dispute resolution • environmental issues and public health issues

Vic Pakalnis, MEng, MBA, P.Eng., is president and CEO, MIRARCO Mining Innovation.

PROVOCATIVE ELECTION THOUGHTS (THAT MIGHT STIMULATE AN URGE TO VOTE)

By Patrick J. Quinn, PhD (Hon.), P.Eng., FEC

THERE ARE MANY concerning issues around our engineering profession and our election process seems to reach the biggest audience for their airing. Consider: Engineers are being graduated from our universities and imported from abroad at a rate that ensures underemployment and downward pressure on engineering salaries. Beware of employer reports predicting shortages of engineers, or arguments that we have a shortage if there are more engineers per square metre in Japan.

In *PE*'s October issue, David Goldberg, a former professor of entrepreneurial engineering and president and founder of ThreeJoy Associates Inc., sees three reasons why engineering may be dying:

1. Engineering education is upside down and backward. Engineering education is a math-science death march in which mathematics and science are viewed as “the fundamentals” and design and technology are viewed as mere “applications.”
2. Engineering education is embedded in a dysfunctional culture that delights in the failure of those it educates. It is common enough to have become a cliché. An engineering professor stands at the front of a class and says, “Look to your right, look to your left. Two of the three of you won't be here next year.”
3. Engineering is perceived as a low-status profession in which engineers are socially captive to the will of non-engineers. There is a belief that engineers often work in organizations in which they have

little control over the work they do, following the orders of professional managers, who carry out goals set by corporate chieftains.

PEO, whatever its assertions as to its role as protector of the public, has steadfastly insisted on an advocacy role for the profession as a whole and, in recent years, has poured money into government liaison work fronted by overtly liberal lobbyists, which seems to often identify PEO with a liberal bias.

President Dixon's response to the collapse of a small portion of a shopping mall was to ask for government intervention, claiming that we needed a provincially appointed czar to oversee our profession—basically admitting PEO's capabilities were not up to the task. More collapses and failures of parts of buildings and infrastructure are highly probable. Many of these elements were built in a time of more limited knowledge, are past their shelf life, and their inadequate maintenance based on a lack of political and business budget priority have rendered them very fragile. Engineers who designed these elements decades ago, or who just gave recent opinions on their status, are prime scapegoat candidates. PEO recently released a practice bulletin for structural engineering assessments of existing buildings. It published a practice guideline for demolition of buildings in 2011, several years after a fatality at a demolition project.

PEO is now a \$25-million-a-year enterprise, and has a governance structure difficult to reform in a timely way through the electoral process because of its base—42 per cent of government

appointees, who have no term limits. Several have recently been appointed to third consecutive three-year terms over the wishes of elected representatives, and our act has recently been amended so that there is no automatic expiration of terms.

Still, however slow the process, elections count and have the potential to affect outcomes for the future of our profession.

Engineers must be more cognizant of reality and to the compromises necessary to progress in a fast-moving world. About six in seven members of PEO see advocating for engineers not worth a couple of hundred dollars a year, presumably because they think we are doing so well that we don't need it. And, like the proverbial frogs in the pot, they haven't noticed the temperature rising.

We must work together and drastically change direction. The answer to the question of whether we are dying as a profession (as we know it) is, undeniably, yes.

The point of this piece is that this issue of *Engineering Dimensions* offers a chance to revitalize while there is still time to influence the future—maybe even ensure the existence of our profession in the future.

I urge you to consider: Do you see a profession that is stronger today than when you joined? Are you satisfied that, as a profession, we are growing in prestige and acceptance?

I have only outlined some of the issues and suggest that you can play a role *just* by casting a vote. You can also talk to your colleagues, communicate with the candidates, send out a ripple that can grow to a wave in support of a profession that has made a great contribution to society and deserves to thrive. Please vote. Σ

Patrick J. Quinn, PhD (Hon.), P.Eng., FEC, is a two-time PEO president.

A DEBATE ON THE ETHICS OF BODY ENHANCEMENT TECHNOLOGIES AND REGENERATION

By Monique Frize, P.Eng., OC, FIEEE



ONTARIO CENTRE
FOR ENGINEERING
AND PUBLIC POLICY

IN THE PAST few decades, engineers and scientists have worked toward the goal of enhancing the human body beyond its capabilities, both physically and mentally. Prior to looking at the debate on body enhancement technologies and regeneration in the fields of biomedical, genetics, nano-medicine and rehabilitation and tissue engineering, it is helpful to examine the various forms of the technologies—those that exist currently, and those under development for deployment in a not-too-distant future. It is likely that the ethical issues raised by emerging technologies depend on what they are. So, in discussing this topic, the technologies need to be categorized in terms of their impact on society and on individuals (Frize, 2011).

First, let's define the term "enhancement technology." "Enhancement technologies are most commonly defined as interventions intended to improve human function or characteristics beyond what is necessary to sustain health or repair the body" (Hogle, 2005). Examples include the replacement of body parts, such as orthoses and prostheses for people who have lost a limb. There are drugs to enhance physical performance in sport, to change moods, and to enhance intellectual performance. There exist many types of implants: pacemakers, insulin infusion pumps for glucose control, and stimulators with different functions and purposes. The goal of these technological developments is to enhance a body's function, capability, or physical or mental performance. These technologies can be used in cases where the body is affected by disease or disability, or just to improve one's looks or physical prowess.

This topic is well known in sports where drugs are sometimes used to enhance performance. At what point does drug use make the playing field uneven for participants? No mat-

ter what the morality of taking drugs might be, there may be an overriding duty to follow the rules of the sport with respect to doping. Are there moral reasons that drug use in sports should be forbidden? On the other hand, does prohibiting drug use restrict the autonomy of the athlete who wishes to use drugs? In the competitive world of sport, there is a developing market for drug-free urine (Budinger, 2006). Drugs can also be used to change behaviour, as in the case of patients with attention deficit disorder. However, these drugs have been shown to have serious secondary effects. At what point does a family decide to use the medication? Is it to make a normally boisterous child more docile, or for a serious case of hyperactivity?

Enhancement can mean an intended change to improve an already normal or average individual's features by surgery or drugs, or it may mean a corrective action needed for a serious medical condition. Take, for example, cosmetic surgery: After a severe accident or burn, corrective surgery can help an individual recover as normal a life as possible, especially after severe disfiguration. What about surgery without medical need? Miah provides examples: "Nowadays we can lengthen our legs, chemically enhance our mental ability, and perhaps even genetically modify ourselves to become stronger, faster or more resilient to wear and tear... The kinds of enhancements we must seek for humanity should not lead us towards a world where we all aspire to look the same as each other, which is a criticism often leveled at the cosmetic surgery industry. Rather, we should encourage human enhancements that amplify human variation. That's what I expect from human enhancement technologies and this is what humanity excels in, as the history of fashion reveals" (Miah, 2009; Miah, 2008).

The story of Orlan, the French professor and performance artist born Mireille Suzanne Francette Porte, is an extreme example of the transmutation of the body, combining surgical, prosthetic and computer technology with consumerism. Since 1990, she has altered her face and body through a series of performance art operations guided by a computer-generated image to which her face has been re-cut. She markets photographs and films of the surgical performances, as well as preserved body parts, complete with a label stating, “This is my body, this is my software” (www.orlan.net). Orlan is not her name. Her face is not her face. Soon, her body will not be her body (Frize, 2011).

However, there are medical imperatives for the use of enhancement technologies. A philosophical question is: When does a human become more a machine than human? Do technologies create an unfair advantage? Or does it provide equal opportunity for people who suffer from some disability? Take the example of Oscar Pistorius, the 25-year-old South African man who was a double amputee at the age of 11 months. Pistorius wears prostheses on both legs; he is also known as Blade Runner. He became Paralympic world champion in 2006, placing first for the 100-, 200- and 400-m men’s track events, and broke his own 200-m record. He requested to compete in the 2008 Beijing Olympics in the regular events but he missed qualifying by 0.7 seconds and so was not selected by the South African team for the 4x400-m relay. However, he was part of the South African team for the 4x400-m relay for the 2012 Olympics in London. His team came last. He defended his title at the Paralympics in London in the 100-, 200- and 400-m events. Would we think differently on the question of appropriateness of including him in the regular events if he had won

gold? It is hard to say what the silver medallist would have said, or the man finishing fourth. However, the question should not be related to the outcome, but focused on the principle of including him or not in the regular events, with a proper analysis with regards to justice, equality, autonomy, etc.



Oscar Pistorius, also known as Blade Runner

Research on tissue engineering and on artificial organs is progressing rapidly. The field started with skin substitutes in the 1980s and ’90s and then moved toward the emergence of regenerative medicine (Badylak and Nerem, 2010). Researchers can regenerate blood vessels and, recently, Doris Taylor, PhD, and her colleagues at the University of Minnesota, have been developing novel cardiac and vascular technologies to prevent, treat and, perhaps one day, cure heart ailments. Taylor has already succeeded in creating the beating heart of a rat through regeneration techniques using stem cells (Taylor, 2011). These advances are promising, but they also raise ethical questions that must be addressed before the outcomes of these research projects become a reality for humans (Frize, 2011). Allhoff et al. (2009) expect that advances in nano-biotechnology and

robotics will lead to the development of artificial noses and ears, whose characteristics will surpass current ones. The authors also mention other advances, such as contact lenses that provide night vision. One of the most controversial aspects of the enhancement concept is the goal to radically extend life by 20, 100 or even 5000 years, either by curing serious pathologies, such as cancer, or developing anti-aging medicine (Allhoff et al., 2009).

WHAT IS NORMALITY?

Enhancement can mean an intended change to improve an already normal, average individual’s features by surgery or drugs, or it may mean a corrective action needed for a serious medical condition.

A related question is: What is normal and what is enhancement? Are reading glasses an enhancement or has this become normal with ubiquitous use? Buchanan writes: “Taken together, literacy and numeracy are profound and far-reaching cognitive enhancements. Computers, building on the platform of literacy and numeracy, extend human cognitive capacities even farther... We now consider literacy, the use of computers, and the ability to engage in large-scale coordinated, complex activities through the functioning of institutions to be ‘normal’ capacities of human beings, but for most of the time during which human beings have existed they were not” (2008).

ARGUMENTS PRO ENHANCEMENT

One argument used to justify human enhancement is proposed by Allhoff et al. The authors of the United States National Science Foundation report write: “Pro-enhancement advocates have argued against regulating enhancements on the grounds that it would infringe on our fundamental ability to choose

how we want to live our own lives” (Allhoff et al., 2009); the authors cite articles by Naam (2005), Bailey (2005) and Harris (2007). One argument suggests we already extend our life through better nutrition, medicine, exercise and sanitation, so why not develop and use other enhancement and regeneration technologies (Allhoff et al., 2009)? The strongest supporter of research on longevity writes: “Technology will play a pivotal role in the solution to the problem of human aging...Medical nano-robotics, if it can be made to work, can unquestionably offer convenient solutions to all known causes of age-related damage and other aspects of human senescence” (Freitas, 2007). This author argues that an investment of \$1 billion over a 15- to 20-year effort could result in a nano-factory that builds medical nano-robots; and, by the late 2020s or early 2030s, they would have widespread use, “marking the beginning of the almost certain end to human aging while also providing treatments for most morbid afflictions of the human body.” The author also suggests that if we could keep our bodies as healthy as in our young years, we would have a median health span approaching 5300 years. Freitas argues that a life lost costs \$2 million; he makes the assumption that the value of human life is the same worldwide as it is in the US and he extends his calculation to the entire planet (2007).

ARGUMENTS AGAINST ENHANCEMENT

There is a response to the freedom argument offered by Allhoff et al: “Whatever rights we have also imply responsibilities and exist within some particular political system, therefore it is not unreasonable to expect or define certain limits for those rights, especially where they conflict with other rights and obligations” (2009). The authors also expect enhancement

could be used by governments to enhance productivity.

Selgelid refers to the argument frequently used by supporters of enhancement: “Since treatment is unobjectionable, and there is ultimately no fine line to be drawn between treatment and enhancement, so enhancement must be unobjectionable too” (2007). He argues that the distinction between treatment and enhancement is hard to make, but important distinctions need to be made. He suggests thinking of this as degrees of enhancement. For example, in the case of treatment, an extreme case would show a person with low quality of life and/or low level of functioning and how an intervention would improve this condition.

Selgelid also provides an example of an enhancement that should not be done: the case of genetic modification of an embryo prior to implantation in the womb that would increase a normal fetus’s intelligence by 25 per cent. This enhancement is experimental at this stage and the author states it should be prohibited, as such a technique has not yet been shown to be safe and effective. However, in the case of a safe and effective technique with no side effects, should this be done? Selgelid says no, because it would create an unfairness for all other infants who are not enhanced. Also, medical practitioners doing this procedure would be taken away from removing suffering from other patients who need their care. In this latter case, it would be considered immoral; it may even be considered illegal if the equality and utility costs are enormous (2007).

On the question of longevity, Selgelid suggests this type of enhancement should be evaluated in terms of the social costs and benefits on a case-by-case basis (2007). It is not difficult to imagine what the social and economic implications would be if humans lived

for hundreds, let alone thousands of years. Consider the current over-consumption of the planet’s resources: it takes the Earth one year and six months to regenerate what humans consume in one year (Catalino, 2006). A severe water shortage is predicted for the future and one billion people currently do not have access to drinking water. Consider the current pension plan that kicks in around age 65. Will people continue to work for hundreds or thousands of years? Is this longevity to be applied to all people of our world or only the rich, who will be able to afford the enhancement technologies?

POLICY IMPLICATIONS AND CONCLUSION

This article has barely skimmed the issues that inform the debate and ethical considerations linked to enhancement and regeneration. The papers cited in this article address many of the issues. My own view is that the debate cannot be generalized to all types of enhancements and to all people. It is evident that:

- (i) The morality and ethical perspectives relating to enhancement will depend on the type of enhancement and the extent to which it makes humans different from what can be considered normal;
- (ii) In each case to be considered, we need to assess how developed the technology is and what its future development is likely to be; and
- (iii) We can use ethical theories, such as Aristotle’s Golden Mean theory, Rawl’s theory of justice, and the Utilitarian theory of John Stuart Mill, to assess whether the enhancement respects equality, justice, autonomy, beneficence and non-maleficence. We must also ensure that autonomy does not contradict the other principles.

A complete moratorium on research is not feasible, as there will always be

some place in the world where rules are different and such work can be done. This is similar to the case of human cloning being done at this time internationally. What we need is research that analyzes the potential social, political, economic and ethical consequences of each type of planned technological development. In this way, we may be able to, as responsible professionals, prevent the worst from happening, while encouraging developments that are beneficial for the majority of the world's population. One important thing to keep in mind is that, while public or private resources are invested in research on enhancements, funding should be set aside to help resolve some of the problems faced by the world's poorest, such as access to potable water; eradication of HIV, malaria and tuberculosis; access to education; infant and maternal mortality; and access to health-care services. Catalino argues that eliminating hunger and malnutrition, ensuring universal literacy, clean water for all, and immunization for every child, could be provided with the money currently spent yearly on luxury items such as makeup, perfumes and ice cream in the US and Europe.

Implementing the United Nations Millennium Goals would be a good way for engineers to assess how they can alleviate some of the world's worst problems. Once these challenges have been met successfully, it would make sense to spend money, energy and time on developing and testing enhancement technologies, while continuing to study in tandem their impact on people, society and the environment.

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REFERENCES

- Allhoff F., Lin, P., et al. *Ethics of Human Enhancement: 25 Questions and Answers*. US National Science Foundation Report. 2009.
- Badylak, S.F. and R.M. Nerem. "Progress in Tissue Engineering and Regenerative Medicine." *PNAS*. Vol 107(8), p. 3285-3286.
- Bailey, R. *Liberation Biology: The Scientific and Moral Case for the Bioethic Revolution*. Amherst, NY: Prometheus Books. 2005.
- Buchanan, A. "Enhancement and the Ethics of Development." *Kennedy Institute of Ethics Journal*. Vol 18(1), p. 1-34, 2008.
- Budinger T.F., and M.D. Budinger. *Ethics of Emerging Technologies: Scientific Facts and Moral Challenges*. Hoboken: John Wiley & Sons. 2006.
- Catalino, G. and G. Catalino. *Engineering Ethics: Peace, Justice, and the Earth*. Morgan & Claypool Publishers. 2006.
- Freitas, R.A. "Medical Nanorobotics: Breaking the Trance of Futility in Life Extension Research (A Reply to de Grey)." *Studies in Ethics, Law, and Technology*. Vol 1(1), p. 1-7, 2007.
- Frize, M., *Ethics for Bioengineers*. Morgan & Claypool Publishers. 2011.
- Harris, J. *Enhancing Evolution: The Ethical Case for Making Ethical People*. Princeton University Press. 2005.

Hogle, L.F. "Enhancement Technologies and the Body." *Annual Review of Anthropology*. Vol 34, p. 695-716, 2005.

Miah, A. "Engineering Greater Resilience or Radical Transhuman Enhancement?" *Studies in Ethics, Law, and Technology*. 2(1), article 5, 2008.

Miah, A. "Make me a superhero: The pleasures and pitfalls of body enhancement." *The Guardian*. www.guardian.co.uk/science/2009/may/01/body-enhancement-cosmetic-surgery-genetics (accessed August 1, 2011).

Naam, R. *More than Human*. NY: Broadway Books. 2005.

Selgelid, M.J. "An Argument against Arguments for Enhancement." *Studies in Ethics, Law, and Technology*. Vol 1(1), p. 1-5, 2007.

Taylor, D. University of Minnesota Stem Cell Institute. www.stemcell.umn.edu/faculty/Taylor_D/home.html (accessed October 2011).



AN ENGINEER'S OBLIGATION TO THE PUBLIC REGARDING GENE PATENTING

By Julia Glinos

OVER THE YEARS, the development of biotechnology and bioengineering techniques has grown exponentially and, with these new technologies, patents have become increasingly important to protect the innovations brought about through human ingenuity. Although the processes to identify, sequence, isolate and compare genes are novel inventions, there is a great deal of controversy surrounding patents on individual genes that have been isolated from native DNA.

It has been established that any new, useful and non-obvious invention can be patented (Human Genome Project). Clearly, anything that is found in nature cannot be patented. However, the Canadian and American governments have allowed naturally occurring gene sequences to become patentable if they have been isolated or are synthetically created versions, because these do not exist in nature. And, in fact,

[POLICY ENGAGEMENT]

cleaving or synthesizing DNA imparts distinctive qualities on the isolated DNA that differ from those of native DNA.

While genome sequencing processes, gene testing and the process of synthetic gene replication are inventions and should be patented, naturally occurring gene sequences are not inventions and should not be patentable. Even isolated or synthetic genes are merely models of natural genes.

Allowing gene patents defies some of the core reasons for authorizing patents and also puts into question the ethical obligations that professional engineers are required to uphold to the general public. Instead, any useful discoveries of naturally occurring gene sequences should be easily accessible through an open source library.

WHAT ARE PATENTS, AND WHAT ARE THEY USED FOR?

According to the Canadian Intellectual Property Office, a patent “is a right, granted by the government, to exclude others from making, using or selling an invention in Canada” and can be obtained for “products, processes, machines, manufactures or compositions of matter that are new and useful as well as new and useful improvements thereof.” In the United States, “The invention must be ‘useful’ in a practical sense (the inventor must identify some useful purpose for it), ‘novel’ (not known or used before the filing), and ‘non-obvious’ (not an improvement easily made by someone trained in the relevant area)” (Human Genome Project). In other words, if a new technology or processing method is developed, the owner(s) can patent it.

Naturally, there are various reasons to obtain a patent, the most important being that the owner of the patent can maintain a competitive edge in the market. Ideally, the money earned from a patent would help the owner do further research on the invention, and potentially push the scientific field into new areas. The monopoly on the invention would also ensure that resources are properly allocated and not wasted on duplicate advancements (Human Genome Project).

WHAT IS A GENE PATENT, AND WHICH OTHER BIOLOGICAL MATERIALS ARE COVERED?

As Canadian law now stands, nucleotide sequences, the basic building blocks of nucleic acids such as DNA and RNA, are patentable since they can be isolated or synthesized (Department of Justice Canada). However, in Europe, a gene patent cannot be granted unless “the process to identify the sequence involved ingenuity or if the sequence had surprising characteristics identified by the inventor” (Gold and Carbone). In the United States, genes, gene fragments, single nucleotide polymorphisms (SNPs), gene tests, proteins and stem cells can be patented as long as the inventor can,

- “identify novel genetic sequences;
 - specify the sequence’s product;
 - specify how the product functions in nature; and
 - enable one skilled in the field to use the sequence for its stated purpose.”
- (Human Genome Project)

Given the context of these conditions, if the sequence and function of a gene are discovered and can be used for at least one useful application, that gene is patentable. This is allowed because isolated gene sequences can be classified as compositions of matter that are new and useful, even though the genetic sequence and function exists in nature.

This logic implies that stem cells are patentable. However, if this were the case, not only would there be ethical implications, further research regarding

genes and stem cells would be inhibited, which would not be in the best interest of the research community and the general public.

There are also ethical issues involved with the monopoly created by gene patents. Consider the case of Myriad Genetics Inc. The company discovered and patented two genes, BRCA1 and BRCA2, the mutations of which can lead to breast and ovarian cancer (World Intellectual Property Organization). Myriad has also developed BRACAnalysis, a test that analyzes a DNA sample from a patient and compares the patient’s genes to the company’s synthetic versions of the genes to look for the mutations that could ultimately lead to cancer. Due to the patents in place on these genes, other companies must obtain a licence to use BRACAnalysis, BRCA1, and BRCA2, thus leaving a patient who needs this test to cover the associated expense (Canadian Cancer Society). In addition, the patents restrict accessibility to this potentially vital test and make it impossible for a patient to seek an alternative test or receive a second opinion (Harvey). This could potentially present a problem if, theoretically, the patented test were to produce a high number of false positive or negative results and resultant erroneous diagnoses that potentially harmed patients.

It is understandable that this is a relatively new technology and, therefore, making the test fully accessible is difficult at this stage. However, withholding a valuable test that could potentially lead to a patient’s appropriate treatment is unethical.

WHAT ARE THE RESPONSIBILITIES OF ENGINEERS TO THE PUBLIC?

Engineers must ensure the safety and well-being of the general public while acting fairly and ethically whenever they practise their trade. According to

PEO's Code of Ethics: "it is the duty of a practitioner to the public, to the practitioner's employer, to the practitioner's clients, to other licensed engineers of the practitioner's profession, and to the practitioner to act at all times with,

- (i) fairness and loyalty to the practitioner's associates, employers, clients, subordinates and employees;
- (ii) fidelity to public needs;
- (iii) devotion to high ideals of personal honour and professional integrity;
- (iv) knowledge of developments in the area of professional engineering relevant to any services that are undertaken; and
- (v) competence in the performance of any professional engineering services that are undertaken."

According to the *Professional Engineers Act*, the practice of professional engineering is defined as: "any act of planning, designing, composing, evaluating, advising, reporting, directing or supervising that requires the application of engineering principles and concerns the safeguarding of life, health, property, economic interests, the public welfare or the environment, or the managing of any such act."

Therefore, any project that demonstrates the practice of engineering, including a genetic engineering project, needs to be performed fairly and ethically with the best interest of the general public in mind.

Engineers need patents to protect the processes and products they develop to protect the intellectual property of the owner. However, when these patents monopolize an important area of health research and could potentially jeopardize the wellbeing of the public, it hardly seems ethical for an engineer to seek out, or enforce, a patent.

CONCLUSION AND SUGGESTIONS

Although synthetic and isolated genes do fall under the category of new, novel

and non-obvious inventions, in reality, if a naturally occurring gene sequence is discovered and isolated, it should not be patented, since the sequence itself is not a new invention. By allowing patents on naturally occurring gene sequences, not only is a potentially unethical monopoly on screening for disease markers created, but it may also limit the progression of research on a given gene. Discovering the sequence and function of a new gene can lead to new advancements; however, unless the gene is modified to lead to new and useful improvements, it should not be patented. On the other hand, if a gene is inserted into a genome and new recombinant DNA is formed, the new variation of the genome is patentable.

Instead, any genes that are sequenced, isolated and found to be useful should be added to an open source library so the appropriate specialists can use them to either conduct more research or for other productive purposes.

As the laws in Canada and the United States currently stand, any protein, gene or stem cell can be patented, and authorizing such patents carries weighty ethical concerns that may not benefit the general public. Since engineers are charged to act in the best interest of the public, they should not seek patents on naturally occurring gene sequences and stem cells and also discourage their superiors from seeking them. However, the tools used to sequence, isolate and synthesize them are novel, beneficial inventions, and engineers, or the companies/clients that employ them, should be able to seek patents on them.

A completely new synthetic gene, protein or organism created in a lab setting and found to be beneficial should be patentable. However, it may or may not be in the public's best interest to have a gene or organism patented, and it is the duty of the engineers and researchers involved in creating them to consider the safety and wellbeing of the general public before pursuing a patent, and to inform their superiors, other companies and clients before they choose to patent.

It may also be of benefit for engineers and researchers to become more involved in the patenting process, and to have them apply to become patent agents. Having experts to review potential patents would make it more likely that the proper actions are taken to ensure that a patent does not eventually harm the general public. Σ

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REFERENCES

- Canadian Cancer Society, "Patenting of genes and gene sequences." Available at www.cancer.ca/canada-wide/how%20you%20can%20help/take%20action/advocacy%20what%20were%20doing/gene%20patenting.aspx?sc_lang=en, accessed 03/01/12.
- Canadian Intellectual Property Office, "Types of Intellectual Property, Patents." Available at www.cipo.ic.gc.ca/eid/site/cipointernet-internetopic.nsf/eng/h_wr00503.html, accessed 03/01/12.
- Department of Justice Canada, "Patent Act, Patent Rules, 111 Sequence Listings." Available at <http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-423/page-26.html#h-44>, accessed 03/01/12.
- Gold, E.R. and J. Carbone, The International Expert Group On Biotechnology, Innovation and Intellectual Property, "Myriad Genetics In the Eye of the Policy Storm." Available at www.theinnovationpartnership.org/data/ieg/documents/cases/TIP_Myriad_Legal.pdf, accessed 03/01/12.
- Harvey T., "Utah firm's gene patent case could go to Supreme Court," October 12, 2011. *Salt Lake City Tribune*. Available at www.sltrib.com/sltrib/money/52711149-79/court-myriad-genes-aclu.html.csp, accessed 03/01/12.
- Human Genome Project, "Genetics and Patenting." Available at www.ornl.gov/sci/techresources/Human_Genome/elsi/patents.shtml#ref1, accessed 03/01/12.
- World Intellectual Property Organization, "Bioethics and Patent Law: The Case of Myriad," August 2006. Available at www.wipo.int/wipo_magazine/en/2006/04/article_0003.html, accessed 03/01/12.

BEST OF THE BEST IN ONTARIO ENGINEERING

By Nicole Axworthy



E. Philip Cockshutt, PhD, P.Eng., receives the 2012 Canadian Academy of Engineering's Léopold Nadeau Memorial Award for Distinguished Service from then President Kim Sturgess. Photo: Robert Faubert

The 2012 Canadian Academy of Engineering's (CAE's) Léopold Nadeau Memorial Award for Distinguished Service has been awarded to E. Philip Cockshutt, PhD, P.Eng. Given to recognize extraordinary service to the academy and profession, the award is named after the late Léopold M. Nadeau, PhD, FCAE, to commemorate his exceptional contributions to the founding of the Canadian Academy of Engineering and his 10 years of exemplary service as its first executive director. Cockshutt has committed his career to energy research and development, spending 20 years in the National Research Council of Canada's (NRC's) engine laboratory before assuming responsibility for the NRC program on alternative energy and then serving as executive director of engineering programs. He later represented Canada on energy-related issues at international meetings as head of the Energy Council of Canada. During this time, he spent seven years as executive director of the CAE, helping to create the Council of Canadian Academies, among many other accomplishments.

The CAE also inducted 19 PEO members as fellows: D. Grant Allen, PhD, P.Eng., Brahim Benmokrane, PhD, P.Eng., Jan Carr, PhD, P.Eng., Michael W. Carter, PhD, P.Eng., Waguih ElMaraghy, PhD, P.Eng., FEC, Ebrahim Esmailzadeh, PhD, P.Eng., Kevin S. Fraser, P.Eng., David Johns, PhD, LEL, John C. Luxat, PhD, P.Eng., Peter Mascher, PhD, P.Eng., C. James Montgomery, PhD, P.Eng., Jan A. Oleszkiewicz, PhD, P.Eng., Jeffrey A.

Packer, PhD, P.Eng., Ravi Seethapathy, P.Eng., Shamim Ahmed Sheikh, PhD, P.Eng., FEC, Xue-min Shen, PhD, P.Eng., Molly Shoichet, PhD, P.Eng., Andrew H. Wilson, P.Eng., FEC, and Jianping Yao, PhD, P.Eng. The CAE awards fellowships to outstanding engineers who have gone above and beyond in making contributions to their fields and their communities.

The Royal Society of Canada (RSC) has elected 71 new fellows to recognize outstanding scholarly, scientific and artistic achievement. Ontario P.Eng.s among them are Claudio Canizares, P.Eng., professor, department of electrical and computer engineering, University of Waterloo; Elizabeth Edwards, PhD, P.Eng., department of chemical engineering and applied chemistry, University of Toronto (U of T); and professors Frank Kschischang, PhD, P.Eng., and Jonathan Rose, PhD, P.Eng., department of electrical and computer engineering, U of T. Founded in 1882, the RSC comprises the academies of arts, humanities and sciences of Canada. Its mission is to recognize scholarly, research and artistic excellence, to advise governments and organizations, and to promote a culture of knowledge and innovation in Canada.

Mohinder Grover, PhD, P.Eng., FEC, was honoured with the 2012 International Electrotechnical Commission (IEC) 1906 Award from the Standards Council of Canada (SCC) on behalf of IEC for dedication to international and national standardization activities related to the IEC 56 Dependability Standard. Each year, SCC joins the international community in celebrating World Standards Day. The event applauds the importance of standards-related activities and pays tribute to the collaborative efforts of thousands of individuals who donate their time and expertise to standardization.

Ontario architects, engineers and project teams received wood design awards at the 12th annual Ontario Wood WORKS! celebration in Toronto. The awards recognize people and organizations that, through design excellence, advocacy and innovation, are advancing the use of wood in all types of construction across the province. The Green Building Wood Design Award went to Vale Living with Lakes Centre, Laurentian University, Sudbury. The project's engineer was J.L. Richards & Associates Ltd. The Institutional-

Commercial Wood Design Award (project valued at more than \$10 million) went to the District of Thunder Bay Social Services Administration Board office. The project's engineer was FORM Architecture Engineering. The Northern Ontario Excellence Award went to the water garden pavilion, Thunder Bay. The project's engineer was Blackwell Bowick Partnership Ltd. The Jury's Choice Award went to the Gathering Circle at the Spirit Garden, Thunder Bay. The project's engineer was Blackwell Bowick Partnership Ltd.

Gabriel Potvin, a University of Ottawa PhD student in chemical engineering, has received the Let's Talk Science 2012 National Volunteer Award for three years of work with the national organization promoting science and engineering at elementary and high schools. Let's Talk Science develops and delivers programs aimed at encouraging youth to pursue science.

Also at the University of Ottawa, a team of mechanical engineering students has won first place at the American Society of Mechanical Engineers (ASME) Technical Poster Competition. Students Steven Chen, Steven Knapp, Glen Torontow, Veronica Wajda, Oscar Wasilik and Lucas West designed a recreational amphibious vehicle as their winning project, which was judged on engineering technical knowledge, design concepts and analysis, and overall poster quality.

A mechanical engineering and management student at the University of Ontario Institute of Technology has won the top prize at Focus 2040, a national management competition hosted by McMaster University that challenges undergraduate and master's students to envision a workplace for the year 2040. Mario Vasilescu used a combination of engineering and management skills to earn the first place spot, along with his partner, an accounting student from the University of Waterloo.

A team of Carleton University engineering students has placed first at the Canadian Aeronautical and Space Institute (CASI) Free Flight Glider Competition. Students Kyle Corbin, James Pady, Hugh Reynolds and Jasper Van Waarden won with their glider, the Lammergeier, against teams from Ryerson University, the University of Manitoba and the University of Toronto over the course of the three-day event.

Earlier last year, Carleton's engineering school also took home the Tom Foulkes Trophy at the annual PEO Papers Night competition, hosted by PEO's Ottawa Chapter. Two teams of Carleton students took home prizes. David Kolkman and Andrew Oneski won Best Overall Paper for *Formula Hybrid Race Car Control System*. Alex Hayes and Matthew Schiedel, won both Most Innovative and Best Commercial Application Paper for *High Performance Housing Project: Solar Decathlon*. Σ



Vale Living with Lakes Centre in Sudbury won the Green Building Wood Design Award from the 12th annual Ontario Wood WORKS! competition.

The District of Thunder Bay Social Services Administration Board office won the Institutional-Commercial Wood Design Award from Ontario Wood WORKS!

The water garden pavilion in Thunder Bay won the Northern Ontario Excellence Award from Ontario Wood WORKS!

The Gathering Circle at the Spirit Garden in Thunder Bay won the Jury's Choice Award from Ontario Wood WORKS!

[DATEPAD]

JANUARY 2013

JANUARY 23-25

Electronic Materials and Applications 2013, Orlando, FL
www.ceramics.org/ema2013

JANUARY 24-APRIL 11

Engineering Project Management (course), Mississauga, ON
www.epic-edu.com

JANUARY 28-30

ASABE Agricultural Equipment Technology Conference, Kansas City, MO
www.asabe.org



JANUARY 28-30

Climate Change & America's Infrastructure: Engineering, Social and Policy Challenges, Tempe, AZ
www.nae.edu

FEBRUARY 2013

FEBRUARY 4-6

ASME 2nd Global Congress on Nanoengineering for Medicine & Biology, Boston, MA
www.asmeconferences.org/NEMB2013/



FEBRUARY 4-8

Paper Week Canada Annual Conference, Montreal, QC
paperweekcanada.ca

FEBRUARY 8-9

Carbon Management Technology Conference, Orlando, FL
www.carbonmgmt.org

FEBRUARY 14

Remediation and Prevention Conference 2013, Winnipeg, MB
www.meia.mb.ca

FEBRUARY 21-22

International Conference on Stormwater and Urban Water Systems Modeling, Brampton, ON
www.chiwater.com



FEBRUARY 21-22

Unified Approach to Water and Waste Water Treatment (course), Toronto, ON
www.ospe.on.ca

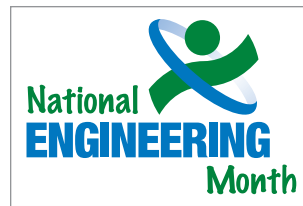
FEBRUARY 25-28

Membrane Technology Conference & Expo, San Antonio, TX
www.awwa.org

FEBRUARY 27-MARCH 1

Canadian Nuclear Association Conference & Trade Show, Ottawa, ON
www.cna.ca

MARCH 2013



MARCH 1-30

National Engineering Month events, across Ontario
www.nem-mng.ca

MARCH 3-6

Stability and Performance of Slopes and Embankments, San Diego, CA
www.asce.org

MARCH 4-6

Foundation Design (course), Mississauga, ON
www.epic-edu.com

MARCH 4-6

Green Rural Opportunities Summit & Canadian Biogas Conference, London, ON
www.gtmconference.ca and www.gtmconference.ca/splashbiogas



MARCH 6

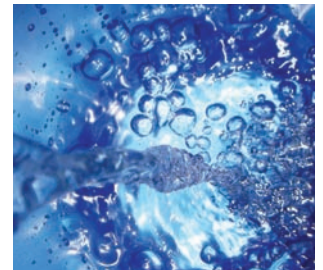
2013 Engineering Innovation Forum: Re-engineering Toronto's Union Station, Toronto, ON
www.EIForum.ca

MARCH 10-13

Utility Management Conference, Glendale, AZ
www.awwa.org

MARCH 16

Preparatory Course for Professional Practice Examination, Toronto, ON
www.ospe.on.ca



MARCH 18-21

Connecting Water Resources 2013, Ottawa, ON
new.cwn-rce.ca

MARCH 21-22

Infrastructure Asset Management: A Strategic Approach Toward Sustainability (course), Ottawa, ON
www.epic-edu.com

[IN COUNCIL]

COUNCIL APPROVES 2013 BUDGETS

482nd MEETING, NOVEMBER 15
AND 16, 2012

By Jennifer Coombes

COUNCIL HAS APPROVED the 2013 operating and capital budgets, as recommended by the Finance Committee.

In the approved operating budget, total revenues are budgeted at \$23.5 million and total expenses at \$22.9 million. Both revenue and expense figures show a decrease as compared to 2012 budget figures (\$0.2 million and \$0.3 million, respectively). For 2013, this leaves a surplus of \$536,000, representing an increase of approximately \$35,000 as compared to 2012.

The forecasted revenue decrease for 2013 as compared to the 2012 budget is due mainly to:

- a \$193,000 decrease in the volume of application, registration, exam and other licence fees;
- a \$183,000 loss of rental income from 40 Sheppard Avenue West tenant ADT, which is expected to vacate its space at PEO's head office on July 31; and
- a \$50,000 decrease in advertising revenue.

Budgeted expenses are expected to decrease in 2013 as compared to the 2012 budget due to:

- a \$400,000 decrease in employee and retiree future benefits based on actuarial estimates;
- a \$51,000 decrease in legal costs;
- a \$193,000 decrease in postage and courier costs; and
- a \$57,000 decrease in insurance costs as a result of lower premiums for directors and officers liability insurance and errors and omissions insurance.

These decreases are offset by:

- an \$184,000 increase compared to the 2012 budget in head office expenses, due mainly to an increase in recoverables expenses related to capital improvements to the building;
- an \$82,000 increase in volunteer expenses; and
- a \$63,000 increase in transaction fees due to higher credit card commissions and transaction fees.

In all other expense categories, PEO expects to hold expenses at current or reduced levels or contain increases to less than 5 per cent.

A capital budget of \$1,843,375 was also approved for 2013, which comprises \$1,378,000 for IT and facilities, \$279,000 for PEO leasehold improvements and \$183,375 for capital improvements to head office.

MINIMUM CASH BALANCE & BORROWING RESOLUTION

PEO's Finance Committee proposed a new Minimum Cash Balance Policy to council, which is intended to be distinct from the current operating reserve that is now fully tied into the value of the building. The policy will ensure there is available cash to finance unexpected shortfalls in planned revenue, capital expenditures, unplanned expenses not included in the annual budget, and other unusual spending requirements, without needing to borrow or finance from outside sources. Council approved a minimum target cash balance of \$4.5 million, which represents approximately two and a half months' worth of PEO's operating expenses. The cash balance will be monitored regularly by the Finance Committee, and will be reviewed and approved annually by the Finance Committee and council.

Council also carried a motion to renew PEO's borrowing policy, which includes an operating line of credit and corporate credit cards with Scotiabank, until January 31, 2014. Council approved an operating overdraft for an amount not to exceed \$250,000 and use of corporate credit cards with an aggregate limit not to exceed \$120,000.

FAIRNESS IN REGISTRATION PRACTICE

As recommended by PEO's National Framework Task Force, council passed a motion to continue developing the policy direction and key considerations of the fairness in registration practices component of the Canadian Framework for Licensure (CFL). The CFL is a model being promoted by Engineers Canada to help Canadian engineering regulators improve their legislative framework to enhance equity, fairness, consistency and timeliness of services. These improvements, in turn, are intended to enhance national and international mobility through uniform qualifications recognition, admissions, and discipline and enforcement procedures. PEO has supported and been an active participant in the CFL since the model's inception.

For the CFL's fairness in registration practices element, "Canadian engineering regulators must promote and maintain registration practices that provide applicants with an equal opportunity to meet the requirements for licensure."

In particular, regulators must:

1. provide fair registration practices that are accessible, timely, monitored, transparent, objective, partial and just;
2. provide an appeal or fairness review process for applicants;
3. demonstrate accountability through the presentation and dissemination of public reporting on registration practices;
4. review and improve registration practices on an ongoing basis; and
5. provide registration practices that are capable of accommodating new and emerging disciplines in engineering."

PEO has now been added to the list of constituent associations that plan to concur with the CFL's fairness in registration practices. Σ

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ADDRESSING CONCERNS

When I first wrote my letter about Canadian railways, published in the March/April 2012 issue of *Engineering Dimensions* ("Efficient transport," p. 45), it was never my intention to use this publication as a forum to discuss the merits of Canadian railways, but to try to clear up some misconceptions that many people have about this vital industry.

I am pleased that Mr. Eder found my letter to be informative and interesting, and I am glad he has taken the time to voice his concerns ("Letter wording," *Engineering Dimensions*, September/October 2012, p. 56). Again, acting as a layman with no past, present or planned future affiliations with the railway industry except a lifelong interest in

railways, I will attempt to address Mr. Eder's concerns.

Regarding his concern about the term "engineer" being used, I, too, expressed this concern in a letter to *Engineering Dimensions* published in the November/December 2010 issue ("A true engineer," p. 85). However, the term "engineer" has been used in this context since railways were first started in the 1830s, and is now so deeply embedded in government laws and regulations as well as in corporate records, union contracts and public usage that the term has become in this context almost generic. If PEO were to challenge this usage, I am sure they would have a very tough battle on their hands.

Regarding his second issue, I somewhat agree with his point, but, in fact, the locomotive pulls the train; the "engineer" controls the locomotive and the conductor controls the operation of the train, as the conductor instructs the "engineer" when to start, when to stop, etc. So, as such, all three (locomotive, "engineer," and conductor) operate as a team. The train doesn't move until all three are in concordance.

As far as Mr. Eder's concerns about my use of English measurement units go, that is the way Canadian railways operate today and I did not want to change the context of my message. Locomotives are rated by horsepower not kilowatts, tractive effort is measured in pounds, brake pressure in PSI, distances in miles, speed in MPH, train and siding lengths in feet, etc. If this causes Mr. Eder concern, please take issue with me, not the editors, as they do a fine job. Actually maybe he should urge the railways to change their ways.

Lastly, the railways' tremendous efficiency advantage over other forms of land transportation is primarily due to the low rolling friction of the steel wheel on the steel rail, the modern diesel electric locomotive, and the use of roller bearings on all freight car axles.

Today, more and more containers are replacing the traditional box car. Trains of 150 cars, with double stacked containers are common. That would require 300 transport trucks and drivers to do the work of two railroaders. Think of the traffic congestion and increased pollution there would be if the railways didn't exist.

Thanks again, Mr. Eder, for your thoughtful letter.

Clayton Morgan, P.Eng., Bowmanville, ON

GOING OFF TOPIC

In August, members were asked for story ideas for 2013 *Engineering Dimensions*, but were reminded that "*Engineering Dimensions* focuses mainly on the legal, regulatory and ethical aspects of the profession." I found that puzzling as I would consider that most of the content of every issue doesn't meet that definition. That is fortunate in that it would be a most dry and uninteresting publication, otherwise. In the September/October 2012 issue, I found the article about the membership card study (p. 18) particularly thought-provoking. I wondered why an organization, with the stature of PEO, would beam with pride at presenting this "real world (environmental) problem" for two groups of four engineering students to solve. Firstly, the solution, which should have been intuitive to PEO well before 2011, was already in place. Secondly, we're talking about the

annual use of about 100 lbs of paper. I can't imagine how the eight individuals managed to occupy their time on this project and come up with an engineering presentation that covered more than the back of an envelope. I worry that this could constitute engineering study for academic credit. While no one could disagree with the plastic card initiative, holding it up as "environmentally sustainable corporate practice" is just a bit laughable. Any wonder why we get no respect! I would like to see you continue going off topic with content, but please present some of the interesting and innovative engineering work going on in our province rather than such triviality.

David Gelder, P.Eng., Mississauga, ON

HIGH-QUALITY MEMBERSHIP CARDS

I find the article “Membership card study affords environmental design learning opportunity” *Engineering Dimensions*, September/October 2012, p. 18) a bit disturbing. I do not think it was wise to have students look at the PEO membership card purely from the point of view of environmental sustainability. For many professional engineers, the PEO membership card is used not just for discounts at partner companies but, rather, as proof of professional status to US Customs and Immigration, for the purposes of border crossings and visas, for business travel and work in the US.

Having spent 13 years working for a consulting firm, and crossing the border into the US frequently, I found that US Customs and Immigration did not have a very high opinion of the card. The previous, annually issued cards were seen as cheap and amateur. The permanent card was considered meaningless because of its lack of expiry. The cards were just about useless, even though the status of being a professional engineer is important and has merit for crossing the border into the US for business purposes. This will only get worse if the cards are printed on demand on regular paper, as anyone could then Photoshop such a card, and they will be truly useless. While this may work for various other membership systems (for example, frequent flyer and other reward programs have gone to the self-print option for membership cards), it does not work well for PEO members, with respect to this one situation. I believe that a self-printed card will only make things worse.

The one option I would hope that PEO would consider is an on-demand issue of a high-quality, membership card, perhaps for an additional fee, but that this card be a high-quality, hard-plastic card similar to credit cards, though without the magnetic stripe, with raised lettering and expiration. Surely, these types of cards are recyclable, or could be made recyclable? It would greatly help the many PEO members who cross the border or obtain work visas for the United States (such as TN-1 visas) that such a card be produced, and that PEO work with the Canadian government to make US Customs and Immigration aware of its existence and validity, perhaps not for individual border crossings, but at least for the application of work visas.

I doubt that engineering students have had this experience, or would be aware of this aspect of the membership card.
Michael Woloch, P.Eng., Hamilton, ON



TIME TO GROW UP

How many times are PEO and OSPE going to get together to agree to get along again? This is ridiculous immaturity on both parties and both parties are beginning to be a disgrace to my profession. PEO and OSPE wonder why there is a lack of involvement at the PEO and OSPE levels? The level of maturity is one reason, as well as the levels of bureaucracy involved with the process. Both parties are not results-based and very little progress is made year to year. PEO and OSPE jointly are slowly giving valid reasons for us to lose our self-regulating status.

The very frustrating thing between OSPE and PEO is the doubling and competing of services from both parties. Grow up, represent us as mature professionals, and stop boasting and playing games to determine who is better than the other.
André Brisson, P.Eng., ing., Tillsonburg, ON



DATE WRITING STANDARDS

There is a disregard (on the part of the information technology sector and the federal government) for standards relating to the writing of the date and time in all-numeric form.

The standards (ISO 8601; CSA-Z234.4) are deemed (for good reason) voluntary. Unfortunately, this seems to be, too often, translated as “You don’t have to pay any attention to them.”

Canada’s health-care fraternity is spending all sorts of resources to design electronic health-care records (“Creating electronic health records...What’s taking so long?” *Engineering Dimensions*, November/December 2012, p. 28). Just about any record worth keeping has on it the date. It has been my observation that there is a wide disparity of sources going into health-care records—MD’s offices, pharmacies, rehab facilities, hospitals, laboratories, etc., plus the testing equipment of which the embedded software includes the date but not necessarily in standard form.

It seems to me that if the engineering profession is to play a constructive role in associating with health care, it can do no less than provide rational inputs to the system; these inputs should include an insistence on standards as they impact the writing of the date in Canada’s health-care system.
Duncan Bath, P.Eng., Peterborough, ON

[LETTERS]

IS THERE A CHOICE?

The fascinating article by Peter Ottensmeyer in your July/August 2012 issue (“Candu fuel waste re-used, recycled, eliminated: \$45 trillion of carbon-free electricity via fast-neutron reactors,” p. 47) describing conversion of Candu fuel waste into almost limitless electricity while substantially eliminating its radioactivity seems compelling and clearly begs his concluding question: Is there a choice?

If there is a downside to his argument, let’s hear it. If there isn’t, let’s get on with it—seems far preferable to burying it for the better part of half a million years when it could be usefully and advantageously cleaned up today.

Gerald A. Crawford, PhD, P.Eng., Mississauga, ON

FLAWED FLUORIDATION

I support President Dixon’s exercise of his individual right to choose the water he wants to drink. Ms. MacDonald (*Engineering Dimensions*, November/December 2012, p. 78) is wrong to dictate that he (and the rest of us) do otherwise.

She needs to understand and respect the medical ethic of informed consent. She ought to consider thoroughly as a professional engineer whether the public interest is truly served by injecting fluoride, one of the three most poisonous substances, into our drinking water. Despite what fluoridation proponents dogmatically assert, recent domestic and international scientific and engineering research shows:

- it is a drug not proven to be safe to humans or other life forms and its dosage is not controllable by age, gender, stage of life, or underlying individual health conditions;
- it is ineffective in its purported purpose of reducing tooth decay while minimizing the incidence of dental fluorosis; and
- the typical fluoridating agent used in water treatment plants causes lead to leach from the water distribution systems (pipes, meters, faucets, etc.) supplying our homes and places of work.

In public policy terms, fluoridation is a flawed and unregulated practice that has failed to meet its stated objectives. It is an outdated dental health technology that incurs significant emotional and economic costs. It has been surpassed by superior means of reducing tooth decay while avoiding adverse health effects.

Unlike Ms. MacDonald, engineers who are well informed on fluoridation know it is not in the public interest to continue this harmful practice. Gerry Cooper, P.Eng., MBA
Public policy advisor, Toronto Coalition to End Fluoridation

FROM THE TAP

I was quite surprised to read in the November/December 2012 issue the letter to the editor titled “Tap not bottle” (p. 78). Its

author may be living in a small non-“fluoridated” town and might not be aware of the perils from the so-called “artificial water fluoridation.” Unfortunately, this problem has been going on unnoticed (or turned a blind eye on) by engineers in this country for far too long.

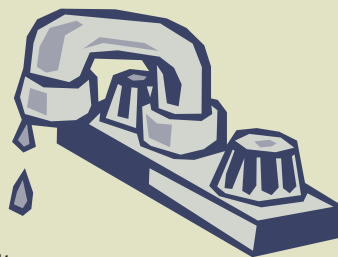
For people who are aware of the problem, and who live in the greater Toronto area or in one of the other 30 to 40 per cent of Canadian communities that are still being force-medicated through this archaic and unethical practice, drinking, or even showering, from the tap represents a major concern.

For further, more detailed considerations on this topic, I would like to refer readers to the following articles published in *Environmental Science & Engineering Magazine*:

- “Canadian water providers ceasing artificial fluoridation,” by Peter Van Caulart, July 2008; and
- “Does artificial water fluoridation mean no golden years for the elderly?” by Sheldon Thomas, September/October 2012.

I send my child to school every day with a bottle of delicious home-filtered drinking water in his backpack, and I bring some to work for myself. No hydrofluosilicic acid and other intentionally introduced contaminants in my water bottle, thank you very much!

Vladimir Gagachev, P.Eng., Mississauga, ON



Letters to the editor are welcomed, but should be kept to no more than 500 words, and are subject to editing for length, clarity and style. Publication is at the editor’s discretion; unsigned letters will not be published. The ideas expressed do not necessarily reflect the opinions and policies of the association, nor does the association assume responsibility for the opinions expressed. All letters pertaining to a current PEO issue are also forwarded to the appropriate committee for information. Address letters to jcoombes@peo.on.ca.

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