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JANUARY/FEBRUARY 2014

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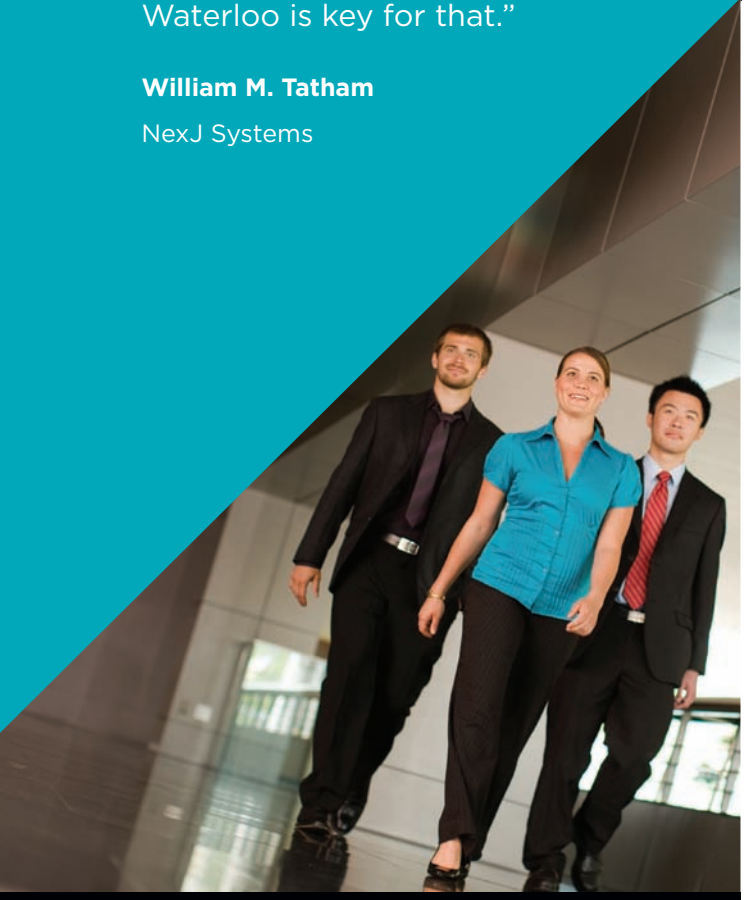

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NEW BEGINNINGS

Annette Bergeron, P.Eng.
President

AS WE WELCOME in the new year, I'm also delighted to welcome our new registrar, Gerard McDonald, MBA, P.Eng., who joined us January 6 and brings to PEO a proven record of high-level regulation development and expertise.

When I ran for election in 2012, I didn't realize we'd have a registrar search during my tenure. It has pre-occupied the first half of my presidency and we are very pleased with the result. My thanks to PEO's Human Resources and Executive committees for their hard work.

Gerard has spent the greater part of his career in public service roles within the country's transportation sector, including holding several leadership positions within Transport Canada, most recently as assistant deputy minister, safety and security. He has also served in the Privy Council Office as director of operations for regulatory affairs for the entire government, and previously served as executive director of the Transportation Safety Board, where he oversaw the administration and operation of the federal body responsible for accident investigation in all modes of transport.

Gerard holds a bachelor of applied science in civil engineering from the University of Waterloo and a master of business administration from the University of Ottawa. He has been licensed to practise professional engineering in Ontario since 1984.

The insight Gerard has derived from his previous roles will be critical in focusing PEO on regulation and guiding our association through complex political, professional and regulatory environments.

As PEO moves forward with a new registrar, I would like to thank Michael Price, MBA, P.Eng., FEC, who has served as acting chief executive officer and registrar since October 2012. Michael continues in his role as deputy registrar, licensing and finance, and is an integral member of our corporate leadership team.

Gerard volunteered to participate in the Chapter Leaders Conference where he brought remarks, and attended his first Ontario Professional Engineers Awards gala in November. As PEO begins this exciting new chapter, please join PEO council in extending to Gerard a warm welcome and your full support. Together, I'm confident we can excel in fulfilling PEO's regulatory mandate.

As 2013 drew to a close so, too, did PEO's participation at the Elliot Lake Inquiry.

On November 18, 19 and 20 in Ottawa, the commission held three roundtables related to Part I of the inquiry, at which PEO had standing, which dealt with the events leading up to the partial collapse in June 2012 of the Algo Centre Mall roof. The framework for these discussions with various invited experts was formed, in part, by the recommendations those with standing provided the commission, based on the evidence presented during more than 70 days of testimony at the inquiry.

In each of the sessions, the experts were led by commission counsel through a series of policy questions prepared by counsel. PEO was represented at the November 20 roundtable in which it participated by Councillor Chris Roney, P.Eng., BDS, FEC. I attended as an observer. Representatives of the Ontario Society of Professional Engineers, the Ontario Association of Architects, the Ontario Association of Certified Engineering Technicians and Technologists, J.L. Richards and Associates Ltd., and Carleton University also participated in the session.

Among the issues discussed were two key recommendations from PEO: the creation of a mandatory standard for structural adequacy reports and of a structural engineering specialty in Ontario. In PEO's proposal to mandate and standardize structural adequacy reports for existing buildings in particular situations, which would require approval from the Ontario government, triggering events might include an order from a building official or a requirement for periodic inspections of certain building categories. This would take discretion for when to inspect particular buildings out of the hands of their owners and make the resulting reports easier for everyone to understand.

Certifying structural engineering specialists would let the public know who is qualified to prepare the reports. In PEO's proposal, a certified structural specialist would be the only one authorized to prepare a structural adequacy report, and he or she would possess a level of expertise in structural engineering above that of licensing. Specialists would be required to file the reports with both building owners and chief building officials.

PEO believes these two steps would strengthen PEO's regulation of engineering practice and help to prevent tragedies similar to the Algo Centre Mall collapse.

Our recommendations to the commission and our answers to the commission's policy questions are available on the websites of both the commission (www.elliotlakeinquiry.ca) and PEO (www.peo.on.ca). Transcripts of the roundtable discussions are also available on the commission website.

The commissioner's report is expected to be ready in October of this year, when we'll know how our recommendations have been received.

My best wishes to everyone in the engineering community for a happy and healthy 2014. Σ

ENGINEERING DIMENSIONS

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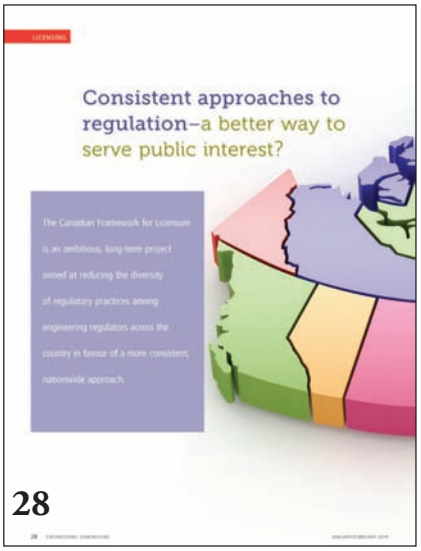

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Through the *Professional Engineers Act*, Professional Engineers Ontario governs licence and certificate holders and regulates professional engineering in Ontario to serve and protect the public.

THIS ISSUE: More harmonized and consistent requirements and processes for obtaining engineering licences could be in the offing as the Canadian Framework for Licensure project goes forward. Meanwhile, regulators ponder the future of Canadian experience as a required element of licensing. The changing path to licensure is the central theme of this issue of *Engineering Dimensions*.

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RETHINKING THE LICENSING MODEL

Jennifer Coombes
Editor

A CORE FUNCTION of PEO for almost a century has been, of course, to license Ontario's professional engineers. With such history, one might think that the requirements for obtaining the licence are pretty much settled by now. But all things evolve and PEO, like all regulators, must be prepared to consider the occasional revision.

Take, for example, the Ontario Human Rights Commission's (OHRC) recent challenge to the Canadian experience requirement for licensure–a component of the licensing process for many of the province's self-regulated professions, including PEO. In PEO's case, it has long been a requirement that of the 48 months of professional engineering experience needed for the P.Eng. licence, at least 12 months must have a Canadian component. But last July, the OHRC called for a review of the requirement for all regulated professions having it, stating that it essentially constitutes discrimination and that "a candidate's Canadian experience, or lack thereof is not a reliable way to assess a person's skills or abilities" (*Engineering Dimensions*, September/October 2013, p. 14). The commission suggests that regulators instead use a system of competency assessment to determine a candidate's eligibility for licensure, a practice that is already being explored by some regulators, including PEO.

For now, the Canadian experience factor stands as a requirement for engineering licensure. But for how long? In "What's in store for the Canadian experience requirement" (p. 32), we invited experts to weigh in on both sides of the issue.

Another key area in licensing is Engineers Canada's Canadian Framework for Licensure project (CFL). Now several years into its work, the CFL Task Force has developed best practices covering many areas to help engineering regulators standardize their registration and licensing practices nationwide. One of the greatest benefits of more consistency will be better practitioner mobility between the provinces and territories.

We take a look at the latest CFL developments in "Consistent approaches to regulation–a better way to serve public interest?" (p. 28).

Braving the first snow storm of the season, 11 remarkable PEO licence holders received Ontario Professional Engineers Awards at a gala held November 23 at the Toronto Congress Centre. Read snippets from the awardees' inspiring and witty acceptance speeches (p. 9).

Earlier in the day, chapter executives gathered for the 2013 Chapter Leaders Conference (p. 13). With its theme of connecting by communication, attendees learned the value of improving communication by traditional means and social media to gain meaningful connections within PEO and other organizations, and also to reach out to the public and members of various levels of government.

By now, you may have heard that PEO has found a successor to former CEO/registrar Kim Allen, P.Eng., FEC, who left in September 2012 to take on the CEO role at Engineers Canada. Gerard McDonald, MBA, P.Eng., who was most recently assistant deputy minister, safety and security, Transport Canada, took the reins January 6 (p. 8).

Of course, I join President Annette Bergeron, P.Eng., council and everyone at PEO in welcoming our new registrar.

Happy 2014, everyone! Σ

NEW REGISTRAR starts at PEO

By Michael Mastromatteo

Gerard McDonald, MBA, P.Eng., joined the staff of PEO on January 6 as its new registrar.

A new registrar joined the staff of Ontario's engineering regulator January 6.

Gerard McDonald, P.Eng., MBA, left his role as assistant deputy minister (safety and security) at Transport Canada to take on the top administrative position at PEO.

McDonald succeeds Michael Price, P.Eng., MBA, FEC, PEO deputy registrar, licensing and finance, who has additionally been acting CEO/registrar since October 2012, a month after Kim Allen, P.Eng., FEC, left the position to become CEO of Engineers Canada.

First licensed by PEO in 1984, McDonald was born in Montreal and raised in Scarborough. He graduated in civil engineering from the University of Waterloo in 1982, and obtained a master's degree in business administration from the University of Ottawa in 1989.

His career includes more than 20 years with the federal government, both at Transport Canada and the Privy Council Office, where he was director of operations for regulatory affairs. He was executive director, Transportation Safety Board of Canada, from 2006 to 2009.

"Gerard brings to PEO a proven record of high-level regulation development and expertise and I am looking forward to welcoming him to our team," said President Annette Bergeron, P.Eng. "I would also like to thank Michael Price for ably directing our staff during the recruitment process."

See the March/April 2014 issue of *Engineering Dimensions* for a more in-depth report on the new PEO registrar.

Engineering input to form key part OF INQUIRY RECOMMENDATIONS

By Michael Mastromatteo

PEO WAS ONE of several engineering, architectural and building construction organizations invited to participate in a November 20 Elliot Lake Commission of Inquiry policy roundtable. Held in Ottawa, the roundtable was convened to discuss the role of professionals and building consultants in preventing tragedies similar to the June 23, 2012 partial collapse of the rooftop parking deck of the Algo Centre Mall in Elliot Lake.

Chris Roney, P.Eng., BDS, FEC, a member of PEO's Elliot Lake Advisory Committee, represented the regulator at the roundtable. He said November 23 that the 11 questions asked of roundtable participants by commission counsel were fully addressed at the session. The questions dealt with issues ranging from the use and definition of a "prime consultant," to PEO adopting guidelines for structural engineering practice and independent, documented structural engineering review.

The questions and PEO's written response are available from the Elliot Lake page on PEO's website at www.peo.on.ca/index.php?ci_id=2289&la_id=1. Responses from all the

participants are available at the Elliot Lake Inquiry website, www.elliotlakeinquiry.ca.

In an interview prior to the roundtable, Roney said PEO's advisory committee was working with legal counsel and others to prepare PEO's response to the questions posed by commission counsel, which were based on testimony heard during the hearings and final submissions and recommendations from those who were granted standing at Phase I of the inquiry, including PEO. Phase 1 dealt with events prior to the collapse. He said a PEO practice bulletin on inspection of existing buildings, published in November 2012, has become a useful resource for the commission. PEO has recommended that the bulletin be formalized as a practice standard and included in Regulation 260/08 to give it force of law.

"There was very positive feedback from the commission, which, in some ways, helped turn around the bad image of engineering that arose in the early stages of the inquiry," Roney said.

Some media commentary in the wake of the collapse asked how so many engineers who inspected the mall prior to its collapse could have missed the potential for collapse.

Also appearing at the building consultant roundtable were Paul Acchione, P.Eng., president and chair, Ontario Society of Professional Engineers; Bill Birdsell, B.Arch., president, Ontario Association of Architects; Greg Miller, C.E.T., vice president, Ontario Association of Certified Engineering Technicians and Technologists; Dale Craig, P.Eng., chairman of Ottawa-based engineering firm J.L. Richards and Associates and retained by the inquiry to provide engineering expertise; and Jag Humar, PhD, P.Eng., professor of civil engineering, Carleton University, and an internationally renowned expert in structural dynamics.

In a November 25 interview, Humar said there was general consensus among roundtable participants. "I believe that the commission received very useful input from the roundtable discussion," he said. "The most important recommendations that were submitted in writing by each of the participants should be useful in the formulation of the commission's own recommendations and in minimizing the risk of similar structural failures in the future."

The other two Phase I roundtables, November 18 and 19, were dedicated to increased public safety and improved sharing of information and reports. Phase II roundtables, scheduled for December 5, were devoted to emergency response issues.

ENGINEERING EXCELLENCE **CELEBRATED AT 66TH** ONTARIO PROFESSIONAL ENGINEERS AWARDS

By Jennifer Coombes

The achievements of 11 engineers were celebrated November 23 at the Ontario Professional Engineers Awards gala in Toronto. Award recipients, back row, left to right: Amir Khajepour, PhD, P.Eng.; Mark Green, PhD, P.Eng.; Michael Branch, P.Eng.; Robert Francki, P.Eng.; and Michael Sefton, ScD, P.Eng. Front row, left to right: Anthony Pasteris, MBA, P.Eng.; Jingxu (Jesse) Zhu, PhD, P.Eng., FCAE; Kenter Novakowski, PhD, LEL; and Carlos de Oliveira, MASc, P.Eng. Stavros Argyropoulos, PhD, P.Eng., FCAE; and Charles Donnelly, MASc, P.Eng., are absent from the photo.

November 23 saw 11 leaders of the profession honoured for their achievements at the Ontario Professional Engineers Awards (OPEA) gala. Co-hosted by OSPE President and Chair Paul Acchione, P.Eng., and PEO President Annette Bergeron, P.Eng., the event was themed around the accomplishments of engineers in the field of entertainment.

Acchione said: "This year's OPEA recipients exemplify the way engineers make our world better–and more fun! This year we're proud to showcase how engineers add to the entertainment industry. They're the driving force behind film special effects, video games, sports venues, and much more."

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Bergeron told the audience PEO is proud to co-sponsor the event and that she finds the award winners so inspirational she brought her daughter, an aspiring engineer.

Among the special guests in attendance were MPP Michael Coteau (Don Valley East), minister of citizenship and immigration; MPP Donna Cansfield (Etobicoke Centre), parliamentary assistant, minister of research and innovation; MPP Jagmeet Singh (Bramalea-Gore-Malton); Jim Beckett, P.Eng., president, and Kim Allen, P.Eng., FEC, CEO, Engineers Canada; Robert Kivi, P.Eng., chair, Consulting Engineers of Ontario; Stephen Morley, C.E.T., president, Ontario Association of Certified Engineering Technicians and Technologists; George Rotor, CEO, Engineers Without Borders; Marisa Sterling, P.Eng., president, Ontario Professional Engineers Foundation for Education; Andy Manahan, executive director, Residential and Civil Construction Alliance of Ontario; Michael Kovacs, president, Engineering Student Societies' Council of Ontario; and William Birdsell, B.Arch., president, Ontario Association of Architects.

Coteau thanked engineers for the work they do in building the province and country and especially for the role they play in helping newcomers integrate into the profession. He said: "When newcomers are successful in the province of Ontario the province is successful, and that's exactly what you're allowing them to do. So I want to say thank you very much on behalf of our government."

Cansfield, who attended on behalf of Minister of Research and Innovation Reza Moridi (MPP, Richmond Hill), also praised the profession: "Engineers are a pivotal part of what happens to the economy and will be for many more years to come. Thank you for the work you do each and every day. You have made a difference."

In a recorded message, Ontario Premier Kathleen Wynne said: "You grow the economy and make Ontario a great place to live. Highly skilled professionals like you are extremely important for Ontario. You play a key role in many diverse fields, including the entertainment industry, which you're celebrating tonight. You should be very proud of your accomplishments so congratulations and thank you once again. I'm very proud of the work that you do."

This year's keynote was delivered by Brian Bonnick, P.Eng., CTO, IMAX, who showed a brief film of the latest IMAX technology. Bonnick said that as a kid he was constantly taking things apart and that he first got started on his career path by cutting a live lamp wire with a pair of scissors. After that, he said, he wanted to be "an electrician, an electrical engineer–or a fireman." He said engineers are the unsung heroes behind movie technology and they've changed how films are made: "Engineers with a passion for excellence have forever changed the way that filmmakers are making movies and how audiences consume them. When I give tours of our research and development facility in Mississauga, I usually tell them this is where the magic happens. The truth is, it's not magic at all. It's engineering at its best."

Helen Wojcinski, P.Eng., chair of PEO's Awards Committee, told gala attendees the "inspiration, dedication and accomplishments of engineers are honoured around the world."

Here are the awardees, in their own words:

PROFESSIONAL ENGINEERS GOLD MEDAL

Michael V. Sefton, DSc, P.Eng., professor, department of chemical engineering and applied chemistry and Institute of Biomaterials and Biomedical Engineering, University of Toronto

"I've gotten this award not from my successes, but because I've failed over and over. It's an important message. It's important to fail–often and repeatedly. If you aren't failing, you're not trying to be ambitious enough."

ENGINEERING MEDAL–ENGINEERING EXCELLENCE

C. (Charles) Richard Donnelly, P.Eng., global director, water power, Hatch Ltd.

"Receiving an award from peers is probably the best award you can get. But when you receive an award like this you tend to get self-involved. But this is not an individual award. Engineering is a team sport. I learned from hundreds of engineering colleagues how to be the best I could be and I accept this award on their behalf."

Kenter Novakowski, PhD, LEL, professor and head, department of civil engineering, and director, Water Research Centre, Queen's University, and agencies in North America and abroad

"I'm honoured to receive this award. I've been fortunate over my career to have two careers: one as a research manager and another at Queen's. I've had the support of many individuals on my path and many of them are here today. Thank you."

ENGINEERING MEDAL–ENTREPRENEURSHIP

J. Carlos de Oliveira, P.Eng., president and CEO, Cast Connex Corporation (CCX)

"Successful entrepreneurs have to exhibit passion, determination and initiative. But most of all, they surround themselves with people who are smarter, more experienced and, in some cases, better looking than themselves. Seriously, though, this award is for all of us. My parents taught me that the true promise of capitalism is that if you work really, really,

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A closer look at health and disability insurance

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

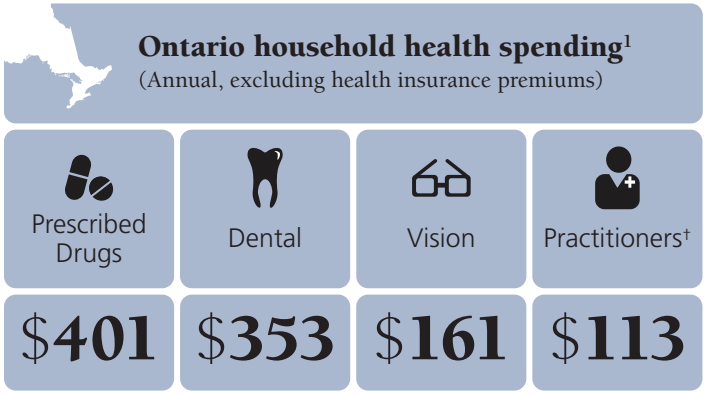
Being ill or injured can be challenging enough without worrying about being driven into debt.

With health and living costs rising steadily, those who are self-employed or don't have coverage at work could face financial hardships. Without an employer's group insurance benefits, you are *left to your own means when it comes to protecting yourself and your family*.

You don't hesitate to insure your home, car and other valuable possessions, so why wouldn't you insure those that are much more valuable than all those things — *your health and your ability to earn an income?*

Health insurance

Supplementary health insurance starts where government coverage ends.



†Other than physicians, dental and vision care professionals

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.

Private health insurance can be *more affordable than you think*. Plus, if you're self-employed, you may be able to deduct the cost of your health insurance premiums from your business income.[2]

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]

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

80% of Ontario residents have supplementary health coverage[3]

34% of Ontario residents have disability income protection[3]

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[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 2011 (Source: Canadian Life and Health Insurance Association, Facts & Figures, Life and Health Insurance, 2012 Edition) and 2011 provincial population figures (Source: Statistics Canada).

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really hard you, too, can make your boss rich. This award is truly a great honour."

ENGINEERING MEDAL–MANAGEMENT

Robert Francki, P.Eng., global managing director, project delivery group, Hatch Ltd.

"It's certainly rewarding to be recognized by one's peers. I consider myself very fortunate to have joined Hatch. I had no expectation of the incredible opportunity, experience, fellowship and mentoring that was in store. My goals were fairly straightforward: to do interesting projects and see the world and, boy, have those come to be true."

ENGINEERING MEDAL–RESEARCH AND DEVELOPMENT

Stavros A. Argyropoulos, PhD, P.Eng., professor emeritus, department of materials science and engineering, University of Toronto

Stavros Argyropoulos was unable to attend the OPEA gala.

Mark F. Green, PhD, P.Eng., professor, department of civil engineering, Queen's University

"I'm very honoured and humbled to receive this award. I feel it's also a very important recognition of the importance of infrastructure in our society and also for looking at innovative ways of repairing infrastructure sustainably. Two of my uncles are professional engineers and were great role models for me. In my work in encouraging Aboriginal students to take up engineering, I've really come to recognize how significant their accomplishments were in becoming engineers as Aboriginal people in the 1950s and '60s."

Amir Khajepour, PhD, P.Eng., professor, mechanical and mechatronics engineering, and Canada research chair in mechatronic vehicle systems, University of Waterloo

"I'm truly honoured to be here tonight. I'm very fortunate to work in a country that has allowed me to work surrounded by such talented people. My faculty has helped me build my research and create strong relationships with industry."

Jingxu (Jesse) Zhu, PhD, P.Eng., professor, department of chemical and biochemical engineering, Canada research chair in powder technology applications, and Ontario director, Particle Technology Research Centre, University of Western Ontario

"Twenty years ago I came to Ontario on April 1 and arrived in a snowstorm. I thought, is this April Fools' Day? Since that day, I've had a lot of support. My colleagues have come here tonight to support me. Ontario gave support, PEO and OSPE gave me support, and also gave me this opportunity. I feel supported all around. Thanks very much."

ENGINEERING MEDAL–YOUNG ENGINEER

Michael Branch, P.Eng., president and CEO, Inovex Inc.

"I'm humbled to be here and honoured to be among such distinguished engineers of the profession. I started because I had a passion for software. Sometimes it's easy to forget that engineering is responsible for the amazing things in the world. Through the figments of our imagination we transform abstract into reality, but we rely on others around us to help realize our dreams. I share this award with the Inovex team, with my advisors, my mentors and my family."

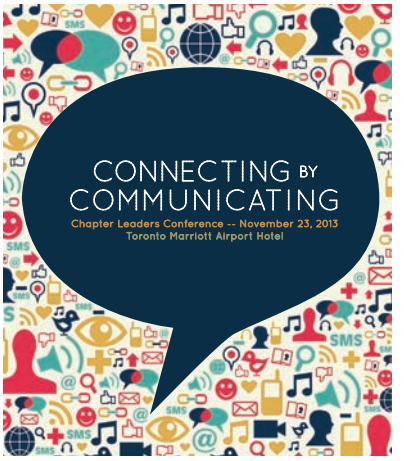
CITIZENSHIP AWARD

Anthony Pasteris, MBA, P.Eng., chairman and president, Minerva Canada Safety Management Education Inc.

"I'm honoured and proud to receive this Citizenship Award. The work done by Minerva Canada is a team effort. This award truly belongs to more than 40 volunteers who make up Minerva, who all share Minerva's vision and are true leaders in promoting the importance of workplace health and safety. Thank you PEO and OSPE for this award and for recognizing the work done by Minerva Canada."

Many thanks to the sponsors of the 2013 Ontario Professional Engineers Awards for their support: Bombardier, Carleton University, Consulting Engineers of Ontario, Dragados, Great-West Life, Hatch, IMAX, Javelin, JLT, Laurentian Bank, Manulife Financial, Ontario Association of Certified Engineering Technicians and Technologists, Saniflo, TD and The Personal, as well as corporate table hosts: AMEC, Arup, Cast Connex, Hamilton-Halton Engineering Week, Hatch, IMAX, Minerva Safety Management Education Inc., Morrison Hershfield, Queen's University, Ryerson University, Siemens Canada, University of Toronto, and University of Waterloo.

CHAPTER LEADERS URGED
to try new communication methods



By Nicole Axworthy and Michael Mastromatteo

"I STILL REMEMBER thinking: we're going to make it to the top of the world," recalls Alan Mallory, P.Eng., guest speaker at PEO's 2013 Chapter Leaders Conference (CLC), November 23 in Toronto.

Mallory was referring to his treacherous, two-month-long climb to the summit of Mount Everest. He was on the final 12-hour stretch from Camp 4, the last stop before the summit–otherwise known as the death zone–which he described as the most miserable and difficult climb of the entire trip. Mallory, along with his father, mother, brother and sister, embarked on this adventure of a lifetime in 2008. Along the journey, he described their encounter with many different and often life-threatening challenges, such as altitude sickness, shifting weather patterns and unexpected storms, ice avalanches and

Alan Mallory, P.Eng., spoke about his journey to the top of Mount Everest, which set the stage for further discussion on communication and outreach.

exhaustion, and how they were able to overcome them through proper planning, communication, teamwork and trust in each other's abilities.

Among other leadership traits, Mallory's story highlighted the importance of communication and trust, and what can happen if clear communication methods are broken or not in place. They were important components as Mallory and his family scaled ice walls stacked with five frozen metal ladders held together by Nepali twine, and when they connected each other with rope in case someone fell through the snow bridges the wind had created over dangerous mountain crevasses.

These traits were also important when, on the way down from the summit, Mallory ran out of oxygen. He was gasping for breath and his limbs were shaking, and he wasn't sure if he was going to make it. His Sherpa climbing guide gave him the tank of oxygen he was using. When Mallory continued to experience the same terrible symptoms, his father discovered the oxygen tank hadn't been connected properly. "Oxygen is a lifeline at that height," said Mallory, who realized that, if he hadn't communicated his symptoms to his father, he might not have survived.

The morning workshop that followed Mallory's inspiring story focused on ways to improve communication and build meaningful connections. With Mallory as the facilitator, the workshop comprised discussion questions to engage chapter leaders in sharing their thoughts and ideas, and learning from each other's successes. Mallory also shared examples from the climb.

The group discussed avenues that could be explored to reach out and engage with members and the public, like PEO and chapter initiatives to increase communication with MPPs through the Government Liaison Program. They also talked about ways chapters are encouraging participation through healthy competition.

The Lake Ontario Chapter, for example, hosts many family-oriented events like BBQs with competitive games that require teams so participants are encouraged to engage with each other. The discussion also focused on the importance of doing something with a common purpose. There was a suggestion that PEO should give chapters challenges each year to encourage engagement among chapters.

The use of technology for communication was also discussed, and the need for more email updates from PEO headquarters to chapter executives. There were suggestions like implementing PayPal for chapter websites, unsubscribe options on PEO mass emails, and a PEO app so people can choose the information they want to receive from headquarters.

The afternoon portion of the conference included two breakout sessions dealing with traditional outreach efforts, and effective use of Twitter, LinkedIn and social media in connecting engineer members to their local chapters.

Stéphane Chiasson, EIT, Sudbury Chapter, assisted by Warren Turnbull, P.Eng., Oakville Chapter, and Arash Yazdani, EIT, Peterborough Chapter, led discussion on the types of activities chapters can undertake to attract new members, or even local politicians to chapter events. During the session, chapter members met in small groups to develop strategies to

Satyendra Bravsar, P.Eng., chair, Brampton Chapter, reflects on outreach strategies at the November 23 CLC.

Wanda Juricic, P.Eng., Windsor-Essex Chapter, hosted the conference's popular Chapter Story Contest.

Rob Willson, P.Eng., CLC Committee chair, offers his summation.

improve internal communication with members while raising the chapter profile in the wider community.

The social media breakout session, led by Randy Walker, P.Eng., Quinte Chapter, and Karen Chan, P.Eng., Lake Ontario Chapter, urged chapter volunteers to consider designating a single volunteer to exploit the instantaneous communication and networking potential afforded by new media. "There is nothing quite like Twitter for the penetration and speed of information," Walker said.

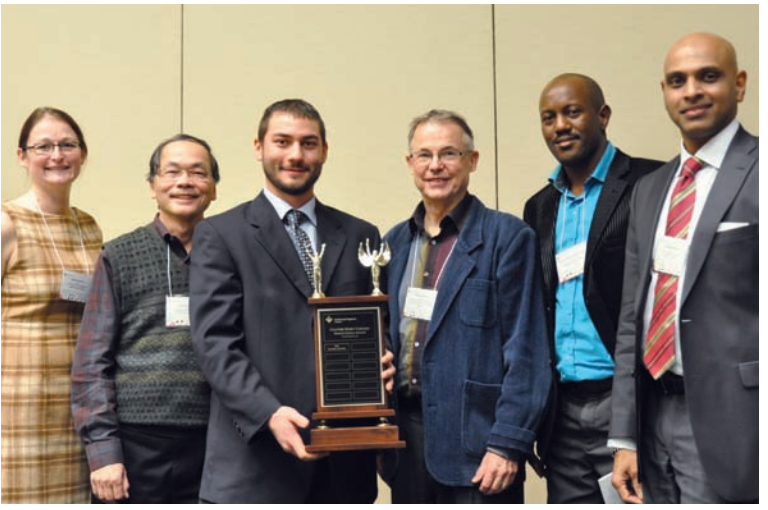
The use of social media for chapter purposes was picked up by PEO President Annette Bergeron, P.Eng., who prior to the conclusion of the conference, urged members to consider putting social media lessons to work in their local communities. Since taking on the presidency last spring, Bergeron has made Twitter and other forms of social media a key element of her PEO-related work.

Desmond Gomes, P.Eng., Brampton Chapter, also supported social media as a valuable but underappreciated tool for chapter members. "Don't fight social media," Gomes said. "It's time to embrace it," adding that Twitter and LinkedIn accounts should be part of every chapter's communications repertoire.

The 2013 CLC featured the second annual Chapter Story Contest, in which 10 chapters shared success stories. The stories ranged from more engaging social events and industry tours, to driving more traffic to chapter websites. The People's Choice story award went to Simcoe-Muskoka Chapter's Tyler Ing, P.Eng., for his lyrical description of his chapter's outreach to middle school-age students.

In a surprise turn, President Bergeron used the conference to introduce Gerard McDonald, P.Eng., MBA, PEO's newly selected registrar, to chapter members (see p. 8). McDonald described chapter volunteers as the "real drivers" of PEO's activities. "I challenge each of you to think of how we can improve what is already a proud and honourable PEO organization as we go forward," McDonald said.

Before adjournment, CLC Committee Chair and PEO Councillor Rob Willson, P.Eng., cited former US president John F. Kennedy, who was assassinated 50 years ago November 22, as a paragon of communication and making new connections. Willson adapted one of the late president's key exhortations–ask not what your country can do for you, but what you can do for your country–as inspiration for chapter volunteers in their future efforts.



Tyler Ing., P.Eng. (centre, with trophy), took the Chapter Story Contest award during the CLC. With him (left to right): Wanda Juricic, P.Eng., Robert Vos, P.Eng., Rob Willson, P.Eng., Francois Nzotungwanimana, P.Eng., and Desmond Gomes, P.Eng.

Randy Walker, P.Eng., Quinte Chapter, outlined the benefits of Twitter, LinkedIn and other social media tools.

PEO court decision reflected in **ONTARIO BUILDING CODE** update

By Nicole Axworthy

The new Ontario Building Code (OBC), which came into effect January 1, no longer includes a table describing rules for design and general review of buildings by professional engineers and architects, previously included in division c, section 1.2 of the 2006 building code.

This change results from a 2007 divisional court decision that found the *Building Code Act, 1992* did not provide sufficient authority to allocate responsibility for the design of buildings between members of the professional engineering and architectural professions.

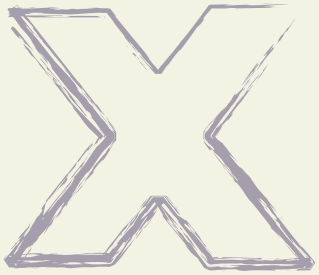
In 2006, PEO applied for a judicial review of amendments to regulations under the *Building Code Act, 1992* that required licensed engineers to qualify and register under a Ministry of Municipal Affairs and Housing regime to engage in building-related design and review of construction activities. PEO believed and the court agreed that the amendments contradicted and otherwise interfered with PEO's statutory role to license, discipline and regulate its members (see "Building code back in spotlight," September/October 2006, p. 14).

The court found that the rules governing the relationship between engineers and architects are given in the *Professional Engineers Act* and the *Architects Act*, and the government did not have authority under the building code legislation to set up a separate system of rules in the OBC governing that relationship. Eliminating the table was a major component of the court decision.

"The decision simply fixed a situation that should not have existed in the first place," says Bernie Ennis, P.Eng., director, policy and professional affairs at PEO. "The regulation of building design activities is solely within the authority given to PEO and OAA by the *Professional Engineers Act* and the *Architects Act*. The 1984 versions of these acts were created to resolve the problem of conflict between the engineering and architectural professions over division of design work in buildings."

Ennis stresses the importance of reading and understanding paragraphs 12(4), 12(5), 12(6) and 12(7) of the *Professional Engineers Act* to know when a professional engineer is required to provide design of any part of a building that involves the practice of professional engineering. The requirements are based on building occupancy, height and area (as defined in the act) and not building construction type, as defined in parts 4 and 9 of the OBC. Every building over 600 square metres in gross building area, or three storeys in height, must be designed by engineers regardless of building type.

A joint bulletin from PEO and the Ontario Association of Architects was also created at the time of the court decision to clarify the requirements of the *Professional Engineers Act* and the *Architects Act* with respect to building design. The bulletin *Design and General Review Requirements for Buildings in the Province of Ontario* can be found at www.peo.on.ca/index.php?ci_id=26075&la_id=1.



NOTICE OF LICENCE **revocation**

ON NOVEMBER 8, 2013, the certificate of authorization of HMO Limited was revoked pursuant to a September 17, 2013 Registrar's Notice of Proposal to revoke a certificate of authorization. As a hearing was not requested within 30 days after the Notice of Proposal was served upon the holder, the registrar carried out the proposal and revoked the certificate of authorization.

CONTACT DAY means close quarters for P.Engs, MPs

By Michael Mastromatteo

Engineers Canada's November 5 Contact Day brought members of its Bridging Government and Engineers Committee to Parliament Hill to meet with members of parliament and talk about the importance of professional engineering.

More than 30 meetings were held with members of parliament from across Canada, including the Honourable Kellie Leitch, minister of labour and minister of status of women, and the Honourable Lisa Raitt, minister of transport.

The theme of the day was "Public safety: A shared priority."

Engineers met with politicians to discuss the importance of having professional engineers involved in public policy, and how they could contribute to key sectors, including infrastructure, innovation and resources, to help drive the country's economy and keep Canadians safe. The day was also an opportunity to highlight the many projects and publications Engineers Canada has contributed to, such as the public infrastructure engineering vulnerability committee protocol, the labour market report and the undergraduate enrolment report.

In an opinion column in the November 4 issue of *The Hill Times*, Engineers Canada CEO Kim Allen, P.Eng., FEC, warned about a shortage of engineers in the coming years.

"The need to build a sustainable, resilient infrastructure and address the looming shortage of engineers who have the knowledge and skills to provide are two issues that are high on the radar of Engineers Canada and policy-makers at every level of government," Allen wrote.

Engineers Canada's Bridging Government and Engineers Committee members intend to meet with other MPs who were not available on November 5.

MPs who met with Engineers Canada representatives on Contact Day are:

Mike Allen (Tobique-Mactaquac)
Joyce Bateman (Winnipeg South Centre)
Carolyn Bennett (St. Paul's)
Leon Benoit (Vegreville-Wainwright)
Dennis Bevington (Western Arctic)
Peter Braid (Kitchener-Waterloo)
Lois Brown (Newmarket-Aurora)
Sean Casey (Charlottetown)
Corneliu Chisu, P.Eng. (Pickering-Scarborough East)

MP David Sweet (centre, PC, Ancaster-Dundas-Flamborough-Westdale) was one of 31 MPs and cabinet members who met with engineers during the November 4 Engineers Canada Contact Day on Parliament Hill. With him are Robert McDonald, P.Eng., FEC (left), of the Association of Professional Engineers and Geoscientists of Saskatchewan, and Rakesh Shreewastav, P.Eng., FEC, PEO council member and a PEO representative on the Engineers Canada board of directors.

Rodger Cuzner (Cape Breton-Casno)
Joe Daniel (Don Valley East)
Patricia Davidson (Sarnia Lambton)
Bob Dechert (Mississauga-Erindale)
Rosane Doré Lefebvre (Alfred-Pellan)
Yvon Godin (Acadie-Bathurst)
Jack Harris (St. John's East)
Laurie Hawn (Edmonton)
Peter Kent (Thornhill)
The Honourable Kellie Leitch, minister of labour and minister of status of women
Wladyslaw Lizon (Mississauga East-Cooksville)
Dave MacKenzie (Oxford)
John McCallum (Markham-Unionville)
The Honourable Rob Moore, minister of state (Atlantic Canada Opportunities Agency)
Rick Norlock (Northumberland-Quinte West)
Anne Minh-Thu Quach (Beauharnois-Salaberry)
The Honourable Lisa Raitt, minister of transport
Bruce Stanton (Simcoe North)
Kennedy Stewart (Burnaby-Douglas)
David Sweet (Ancaster-Dundas-Flamborough-Westdale)
Lawrence Toet (Elmwood Transcona)
The Honourable Lynne Yelich, minister of state (foreign affairs and consular services)

Engineers Canada officially changes name and launches new website

By Jennifer Coombes

ENGINEERS CANADA'S corporate name is now legally Engineers Canada. Engineers Canada is the federation of the 10 provincial and two territorial bodies that regulate engineering practice in Canada.

The organization's filings for its official name change were accepted in early November under the new *Not-for-Profit Act* and consequently Engineers Canada's former corporate name, the Canadian Council of Professional Engineers, will no longer be used. The organization adopted Engineers Canada as its business name in 2007 as part of a rebranding strategy, but did not officially change its corporate name at that time.

In other news, Engineers Canada launched a completely redesigned, mobile-friendly website at www.engineerscanada.ca on November 7.

CANADIAN LICENSING MODEL TO BE PROMOTED INTERNATIONALLY

By Michael Mastromatteo

A report released by Engineers Canada's International Committee contains recommendations that, if implemented by provincial engineering regulators, could change the way applicants are made ready for the engineering licence.

The report, *Assessment of Impacts of Globalization on Engineering Education, Practice and the Regulation of the Profession*, is the result of a May 2011 globalization workshop in Ottawa.

The workshop led to the creation of task groups on education, regulation and practice, each of which made recommendations in their particular sphere.

The report calls for promoting the Canadian licensing model internationally, while studying other licensing regimes to see if successful practices might be incorporated into a more uniform Canadian model.

Ken McMartin, P.Eng., FEC, Engineers Canada's director, professional and international affairs, said the report's 30 recommendations will be reviewed further to see which apply to the national association, to constituent associations, such as PEO, or to engineering professional associations.

In addition to international promotion of the Canadian licensing model, regulation-related recommendations include aligning registration practices with the federal government's work on assessment of international applicants, and establishing a national qualification evaluation system.

To enhance understanding of engineering regulation in Canada, the report also recommends promotion of competencies needed to fulfill the Canadian experience requirement, and developing a "national understanding" of the value of this requirement.

With respect to practice-related issues, the globalization report recommends greater participation by engineering associations and individual practitioners in international organizations and trade missions, and developing ways of gathering information on impediments to the export of engineering services.

In regard to engineering education, the report suggests engineering graduates be exposed to "inter-cultural" competence, gained through international experience. As well, the report encourages engineering educators to consider alternative curriculum delivery methods in support of internationalization, and revising accreditation criteria to allow greater flexibility in accommodating international academic experience.

A number of recommendations in the globalization report would, if adopted, have an impact on the ongoing Canadian Framework for Licensure (CFL), another Engineers Canada project to help bring consistency to Canada's licensing and registration practices.

See page 28 in this issue for more information on the Canadian Framework for Licensure.

Competency-based assessment **A NEW PRIORITY** for regulators

By Michael Mastromatteo

SELF-REGULATING professions face challenges in demonstrating their relevance and accountability, as well as the effectiveness of their assessment models.

These were among the common themes at the 2013 annual conference of the Canadian Network of National Associations of Regulators (CNNAR), held October 24 to 25 in Toronto. The conference featured a wide variety of shared experience in such areas as governance, registration practices, quality assurance, preserving public confidence and competency-based assessment of would-be members.

A secondary topic at this year's conference was regulatory organizations' responses to showing fairness and transparency in registration practices for internationally educated applicants.

CNNAR is an organization of provincial and territorial groups established by legislation to protect the public through the self-regulation of professions.

Marking its 10th anniversary in 2013, CNNAR encourages cooperation among regulatory associations and promotes their value to the public, government and other professional groups.

Key presenters at the conference included lawyer Richard Steinecke of Toronto law firm Steinecke Maciura LeBlanc, who discussed exemplary practices for regulators, and the challenges inherent in evaluating their overall performance.

Steinecke, who represented PEO in its legal challenge of government encroachment on the *Professional Engineers Act*, said regulators can improve their governance and maintain public confidence by fully understanding their proper role, educating the public and stakeholders about their mandate, evaluating their overall performance, and undertaking proper enforcement of their regulated authority.

Another key presenter was Harry Clayton, president of the Professional Standards Authority, an organization dedicated to the regulation of health care professions in the UK. In his presentation–Guarding the Guardians–Clayton said "quality-assured" regulation stems from taking the "right touch" to the process.

"Right-touch regulation is based on a proper evaluation of risk, is proportionate and outcome-focused [and] creates a framework in which professionalism can flourish and organizations can be excellent," he said. "Excellence is the consistent performance of good practice combined with continuous improvement."

Consultant David Cane of Catalysis Consulting later offered his view of competency-based assessment as an increasingly important method of appraising an applicant's worthiness for licensing. Cane, whose firm helps develop outcome-based standards for the workplace, said there is confusion between competence and competencies.

He said competence refers to the ability of a practitioner to function safely, effectively and ethically in a specific workplace environment, and that it is enabled by the possession of competencies. "A competency is a job task that can be performed with a specified level of proficiency," Cane said. "In an ideal world, it would be based on on-the-job observation. The real world, however, doesn't allow for such proximity, so competency relies on various assessment vehicles. Assessment of competencies relies on the demonstration of indicators in selected assessment vehicles."

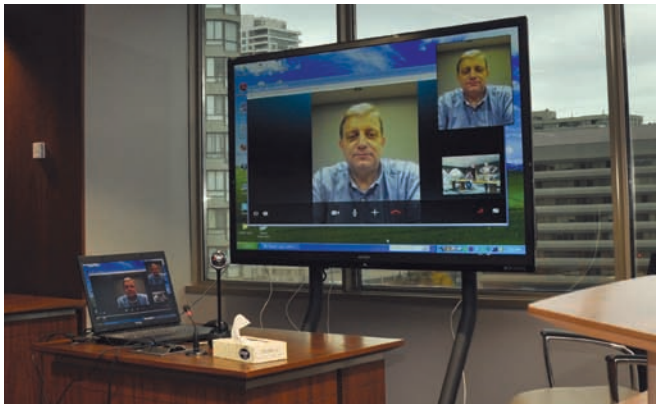
The fair registration practice issue was addressed by two panel discussions, one reviewing the effectiveness of fairness legislation in different provinces, the second focusing on the possible clash between self-regulation and human rights. A number of senior regulators, including PEO, have been called on to defend Canadian experience as a licensing requirement.

The 2013 CNNAR conference included several "café" or small-group discussions on such issues as communicating and defending disciplinary activity, the difference between standards, guidelines and policies, and training for adjudicators in discipline cases.

In summarizing the prevailing attitudes toward self-regulated professions today, Steinecke said information technology has improved regulators' registration and application processes, and has allowed some groups to provide alternative paths to registration. He also said the introduction of fairness legislation and the need to accommodate internationally educated applicants have forced regulators to re-examine their admission practices and to bring more consistency and transparency to overall operations.

Committee introduces Skype for registration hearings

By Michael Mastromatteo



Monitors for Skype use on display in PEO's tribunal room.

PEO'S TRIBUNALS and regulatory affairs department is now using Skype to allow remote witness testimony for its registration hearings.

It's believed PEO is the first regulator in North America to take advantage of Skype for this purpose.

Skype, an advanced form of videoconferencing technology allowing live video and audio conversations, allows users to communicate with peers by voice, using a microphone, video, using a webcam, and instant messaging over the Internet.

In the case of the PEO tribunal office, Skype permits witnesses to give testimony by camera from remote locations. It's especially valuable in PEO registration matters because of the high number of international applicants required to provide information to the committee.

Working with PEO's IT and facilities teams, tribunals staff tested and finalized the Skype hook-up November 6.

The Ontario Fairness Commissioner, which investigates the integration of internationally educated professionals into regulated professions, has recommended the use of Skype as a commendable registration practice for regulators.

PEO is investigating the possibility of using Skype for future discipline hearings.

Transportation "crisis" HOT TOPIC at chapter town hall

By Michael Mastromatteo

Engineers are increasingly called on to address the crisis in urban transit and congestion, said transportation officials at a November 4 transportation town hall meeting in Mississauga.

Organized by PEO's Mississauga Chapter, the event drew some 250 chapter members and guests, and was hosted by David Lapp, P.Eng., manager of professional practice at Engineers Canada.

In describing the objectives of the evening, Mississauga Chapter Chair Art Kirnichansky, P.Eng., said the town hall was called to discuss transportation problems in the greater Toronto-Hamilton area, and to consider potential solutions.

Presenters included Ron Starr, P.Eng., an elected member of Mississauga city council; Martin Powell, P.Eng., Mississauga's commissioner of transportation; Chris Hill, president of Electric Mobility Canada; Adam Giambrone, former Toronto city councillor and former chair of the Toronto Transit Commission; Linda Weichel of the Greater Toronto Civic Action Alliance (www.your32.com); and Greg Percy, vice president of GO Capital Infrastructure and Metrolinx.

Mississauga Mayor Hazel McCallion also spoke at the meeting to hammer home her view that transportation in the greater Toronto area (GTA) is already in crisis and that it's only going to get worse.

The Mississauga mayor has long stated that taxpayers must resign themselves to paying more for transportation infrastructure as an investment in future economic prosperity. She also called on elected officials to step back from political posturing and allow "experts," including professional engineers, to suggest workable solutions.

The crisis in transportation theme was reiterated by Powell, who said the easy solutions have already been tried, and that it's now time to focus on more ambitious infrastructure investments.

"The GTA is growing at a rate of about 100,000 people a year," Powell said. "We are very much in a crisis situation and if we don't act now, imagine what things will be like in 10 years?"

Speakers agreed that whether it's through tax increases, road tolls, or other revenue sources, motorists, transit riders and property owners will be paying more for transportation upgrades in the Oshawa to Hamilton corridor. And at a time of declining public confidence in the government's ability

Mississauga Mayor Hazel McCallion was a special guest at the November 4 transportation town hall organized by PEO's Mississauga Chapter.

to expend resources wisely, engineers are especially encouraged to put their transit solution ideas forward.

"If residents, engineers, local communities and the public are more involved in the decision making, there will be more support for the increased spending required to address transit issues," said Weichel.

Possible relief of congestion problems and out-of-date transportation infrastructure may come through developing autonomous/driverless vehicles, but this isn't expected to reduce the number of traditionally driven vehicles for decades to come.

Fifty-two years and counting for

Lakehead Chapter conference

By Michael Mastromatteo

PEO'S LAKEHEAD CHAPTER, in the Thunder Bay area, offered a wide range of technical presentations to chapter members at its 52nd annual Engineering and Technology Conference November 1 at the Valhalla Inn.

Keynote speaker was Stephanie Gordon, P.Eng., project support manager, Ontario Power Generation (OPG), who spoke on the history and engineering behind the Niagara tunnel project.

In her address, Gordon outlined the technological intricacies of the project, which will divert enough water from the upstream Niagara River to produce another 1.5 billion kilowatt hours of hydro electricity.

The tunnel project has attracted wide attention from the engineering community and was featured in the July/August 2011 issue of *Engineering Dimensions* (p. 50) as an example of Ontario engineering innovation.

The conference also featured presentations from four engineers and a professional geologist on topics ranging from the Ring of Fire mineral development in northern Ontario to biomass conversion efforts at OPG's Atikokan power generating station.

PEO President Annette Bergeron, P.Eng., brought greetings from the regulator, while Ontario Society of Professional Engineers (OSPE) President Paul Acchione, P.Eng., spoke on behalf of the advocacy and member services organization. Other speakers included PEO Vice President Sandra Ausma, P.Eng., PEO Northern Regional Councillor Michael Wesa, P.Eng., and Thunder Bay city council member Iain Angus.

As is customary with many chapter events, the Lakehead conference included certificate presentations to volunteers and newly licensed chapter members, the awarding of scholarships to local engineering students, and an update on the PEO Licensure Assistance Program, led by Dane Parent, EIT.

Darcey Bailey, P.Eng., of OPG's Bare Point Water Treatment Plant Pilot Project, described progress and environmental benefits in converting the Atikokan generating station from coal powered to 100 per cent biomass fuel.

Later, Bruce Adamson, P.Eng., Adamson Consulting, Thunder Bay, brought an international flavour to the event by outlining the operations of the Three Gorges Dam on the Yangtze River in central China. Adamson reviewed the project's design, construction, operation and impact on the local area, and how the world's largest hydroelectric dam also prevents flooding in the lower Yangtze River.

Lakehead Chapter Chair Phil Riegle, P.Eng., and Chapter Secretary Louis Richard, P.Eng., say they are proud of the conference's long history. Established in 1961, the event continues to provide technological topics of interest to the local community.

New engineering program ADDRESSES SPECIAL NEEDS OF FIRST NATIONS COMMUNITIES

By Jennifer Coombes

Mark Green, PhD, P.Eng.

A new program in development by Queen's University civil engineering professor Mark Green, PhD, P.Eng., aims to provide graduate engineering students and researchers the skills to work in remote and Aboriginal communities. Under the CREATE Training Program in Sustainable Engineering in Remote Areas (SERA), students will learn about natural resources, sustainable building, renewable energy sources, and Aboriginal cultural, legal and policy issues, through a combination of training, internships, seminars, workshops and research. Particularly critical is sustainability, which will become even more important in developing energy-efficient housing in remote, northern communities as energy costs soar.

Green, a member of the Mohawks of the Bay of Quinte, says non-Aboriginals can be unprepared to handle the special conditions these communities present, such as fragile ecosystems, and this program is designed to fill in the gaps. In developing the program, he collaborated with the university's Four Directions Aboriginal Students Centre, the First Nations Technical Institute in Tyendinaga Mohawk Territory, the Royal Military College, the University of Manitoba and the University of Ottawa.

Natural Sciences and Engineering Research Council of Canada will fund SERA in the amount of $1.65 million, which will support the program for its six-year lifespan.

Several companies and organizations in the private sector have also signed on to partner with SERA. Ontario Waterpower Association, Hatch, Neegan Burnside, AFN, Halsall Associates and BRE Canada will offer their own experience and expertise to the Queen's program and will, in turn, be provided a pool of uniquely qualified engineering graduates to draw upon.

Students whose postgraduate research involves renewable energy or sustainable building technologies are eligible to apply to the program. A small number of undergraduate students of Aboriginal descent will also be considered for admission.

Over the course of the six years, Green hopes to graduate over 50 postgraduate and undergraduate students.

"I am very excited about this new program because of the opportunity to enhance sustainability while partnering with Aboriginal communities. The work is also very important because of the focus on engineering education for Aboriginal students and teaching other engineers about cultural considerations when working with Aboriginal communities," says Green.

For more information and to receive an application form, email sera@queensu.ca.

NEW ACT COMMITS TEACHERS COLLEGE TO MORE OPENNESS

By Michael Mastromatteo

PEO AND OTHER regulators across Ontario will monitor the impact of new legislation designed to bring greater transparency and accountability to the Ontario College of Teachers (OCT), the largest regulatory body in the province.

Bill 103, the *Protecting Students Act*, was introduced in the Ontario legislature September 18.

The bill would commit the OCT to put more information about disciplined members on its public register, plus bring efficiencies to the review and resolution of complaints between members and the college.

The student-focused bill comes in response to the June 2012 release of the LeSage report, which reviewed the opera-

tions of the OCT. Mr. Justice Patrick LeSage, former chief justice of Ontario Superior Court, made 49 recommendations to address criticism the OCT was taking too long to adjudicate complaints and discipline issues, not publicizing outcomes, and imposing inadequate penalties on teachers found guilty of breaking the rules.

OCT Registrar Michael Salvatori welcomed the bill, saying it will improve transparency and efficiency throughout the organization.

Liz Papadopoulos, the college's chair, said the OCT has already made great strides in how it shares information with the public and members. "The proposed legislation will expand the college's authority to deal with matters in an effective and transparent manner. This will better serve the public interest–those of parents and students," she added in a statement.

The legislature began debating the bill on second reading on October 1.

"No doubt, our regulatory colleagues will be interested in how this landmark legislation affects our collective responsibilities to serve the public interest," said Salvatori. "A new bar has been set–one that promises greater accountability, transparency and efficiency, and bolsters public confidence in all of Ontario's regulated professions."

CORRECTION

In our November/December 2013 issue (p. 9), we incorrectly identified one of the 2013 recipients of PEO's annual MPP awards as New Democratic Party (NDP) MPP Catherine Fife. In fact, the award was given to NDP MPP Taras Natyshak.

Leadership comes in many forms, students told

By Michael Kovacs

It's been a busy fall term for the Engineering Student Societies' Council of Ontario (ESSCO), including extensive interaction with PEO, the Ontario Society of Professional Engineers, and the Council of Ontario Deans of Engineering, culminating in the PEO Student Conference in Toronto November 15 to 17. Students from York University's Lassonde School of Engineering hosted about 70 students from universities throughout Ontario, who took part in the conference themed around engineers changing the world.

Engineering students from a number of Ontario universities demonstrate their enthusiasm at the November 15-17 PEO ESSCO conference at York University. The theme of the annual conference was engineers changing the world.

Student delegates took part in workshops and discussions on communication, entrepreneurship, and professional development. Speakers helped to connect their experiences to their ethical responsibilities as engineers, and students were inspired by their unique stories of personal development.

The conference also included a panel discussion led by Julie Lassonde-Gray, P.Eng., Jasminder Brar, LLB, and Mark Halinaty, P.Eng., who shared their experiences in mining, intellectual property law, and working in both the transportation and defence industries.

continued on p. 24

continued from p. 23

Jeannette Chau, P.Eng., manager of student programs at PEO, offered the keynote address. Other presenters over the weekend included government relations consultant Jim Grey, and human resources recruiter Jackie Lee.

Dozens of new, profession-oriented students attended, and were exposed to ESSCO for the first time. It is hoped that students attending the conference returned to their respective schools armed with information to help their peers learn about the role of engineering regulation, and PEO's stepped-up efforts in support of the undergraduate community.

ESSCO is sincerely thankful for such a strong connection with PEO, and with supporters of the conference. This support helped to bring a number of notable speakers and unforgettable opportunities to the event.

One opportunity came early on Friday at an exclusive Queen's Park lunch with Soo Wong, MPP (Scarborough-Agincourt), facilitated by PEO's Government Liaison Program. The lunch came with an engaging twist as students took on roles of advocates and MPPs. The exercise exposed students to the world of political representation and their power as future professionals to impact policy and benefit society.

Students and EITs looking for more information about ESSCO can email me at president@essco.ca.

Laskin presentation FOCUSES ON improving decision writing

By Michael Mastromatteo

Mr. Justice John Laskin (right) offered insights on decision writing November 7 at an information session organized by PEO's tribunals office. Deputy Registrar Tribunals and Regulatory Affairs Johnny Zuccon, P.Eng., FEC (left), was among more than 30 volunteers and PEO staff taking part.

TO FURTHER TRAINING of Discipline Committee volunteers, PEO's tribunals office hosted a presentation November 7 on decision and reason writing led by Mr. Justice John Laskin, a 20-year member of Ontario's Court of Appeal.

Mr. Justice Laskin, the son of Bora Laskin, the 14th chief justice of the Supreme Court of Canada, is one of the most prestigious jurists to address PEO volunteers. He advised members of the Discipline Committee on how to write more effective, concise decisions and reasons.

In his hour-long presentation, Laskin used previously published Gazette materials to help committee members better understand the choice of words, and even headlines, in their decision and reason writing efforts. He said long columns of "unbroken text" intimidate the reader and make the written decision less effective overall.

In its biography of Laskin, the Ontario Court of Appeal website lists expertise in decision and appellate judgment and factum writing as among Laskin's many achievements in his 44-year legal career.

Prior to his appointment to the court of appeal, Laskin had a long career as a litigation and appellate counsel. He was invited to address PEO volunteers by David Jacobs, LLB, independent legal counsel to the Discipline Committee.

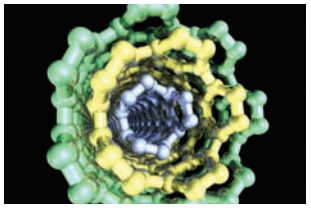
[DATEPAD]

JANUARY 2014

JANUARY 20-23
19th Asia and South Pacific Design Automation Conference, Singapore
www.ece.nus.edu.sg/stfpage/elehy/aspdac2014

FEBRUARY 2014

FEBRUARY 1-6
SPIE Photonics West 2014
San Francisco, CA
spie.org/x2584.xml



FEBRUARY 2-5
ASME 3rd Global Congress on NanoEngineering for Medicine and Biology
San Francisco, CA
www.asmeconferences.org/NEMB2014

FEBRUARY 3-4
Life Cycle Cost Analysis for Pavement Design (workshop), Mississauga, ON
www.epic-edu.com

FEBRUARY 3-6
Paper Week Canada Annual Conference
Montreal, QC www.paperweekcanada.ca

FEBRUARY 9-12
Manitoba Water & Wastewater Association Annual Conference & Tradeshow
Portage la Prairie, MB
www.mwwa.net

FEBRUARY 10-12
Agricultural Equipment Technology Conference
Louisville, KT
www.asabe.org

FEBRUARY 10-12
Arctic Technology Conference, Houston, TX
www.arctictechnologyconference.org

FEBRUARY 15-19
20th IEEE International Symposium on High Performance Computer Architecture, Orlando, FL
hpca20.ece.ufl.edu

FEBRUARY 15-20
SPIE Medical Imaging 2014, San Diego, CA
spie.org/x12166.xml

FEBRUARY 16-21
Gordon Research Conference: Colloidal, Macromolecular & Polyelectrolyte Solutions
Ventura, CA
www.grc.org

FEBRUARY 24
Upwind Downwind Conference: Built Environment–Foundation for Cleaner Air
Hamilton, ON
www.cleanair.hamilton.ca

FEBRUARY 24-26 Modern Power System Protective Relaying (workshop)
Mississauga, ON
www.epic-edu.com

FEBRUARY 25-26
Foundations of Construction Law (workshop), Ottawa, ON
www.epic-edu.com

FEBRUARY 25-28 The Utility Management Conference 2014
Savannah, GA
www.wef.org/utilitymanagement2014

FEBRUARY 26-27
15th International Workshop on Mobile Computing Systems and Applications
Santa Barbara, CA
www.hotmobile.org/2014/

FEBRUARY 26-27
International Conference on Stormwater and Urban Water Systems Modeling
Toronto, ON
www.chiwater.com

FEBRUARY 26-28
Canadian Nuclear Association Conference & Trade Show
Ottawa, ON
www.cna.ca

MARCH 2014

MARCH 1-30 National Engineering Month events, across Ontario
www.nem-mng.ca

MARCH 3-5 Growing Sustainable Bioeconomies Conference & Exhibition
London, ON
www.gtmconference.ca

MARCH 3-6 9th ACM/IEEE International Conference on Human-Robot Interaction
Bielefeld, Germany
humanrobotinteraction.org/2014/

MARCH 5 Managing Change: A Workshop for Municipal Managers (workshop), London, ON
www.epic-edu.com

MARCH 6 2014 Engineering Innovations Forum: Engineering Innovations in 3-D Imaging, Toronto, ON
www.EIForum.ca

MARCH 6-7 TAU 2014
Santa Cruz, CA
www.tauworkshop.com

ONTARIO ENGINEERS RECOGNIZED FOR ACHIEVEMENTS

By Nicole Axworthy

Cristina Amon, ScD, P.Eng., has been inducted into the Hispanic Engineer National Achievement Awards Corporation Hall of Fame. Doug Hooton, PhD, P.Eng., is the recipient of the 2013 Robert E. Philleo Award from the American Concrete Institute.

Yu Sun, PhD, P.Eng., and David Sinton, PhD, P.Eng., have been elected fellows of the American Society of Mechanical Engineers.

Cristina Amon, ScD, P.Eng., has been inducted into the Hispanic Engineer National Achievement Awards Corporation Hall of Fame. The annual honour recognizes a member who has achieved a level of excellence in science, technology, engineering and math, and opened minds about the contributions of Hispanics in these fields. As dean, faculty of applied science and engineering, University of Toronto (U of T), Amon is cited for providing visionary leadership to one of the world's most distinguished engineering schools. She is also lauded as a pioneer in the development of computational fluid dynamics for formulating and solving thermal design problems subject to multi-disciplinary competing constraints, and she continues her research at U of T in nano-scale thermal transport in semiconductors, energy systems and bioengineered devices.

Doug Hooton, PhD, P.Eng., professor, civil engineering, U of T, is the 2013 Robert E. Philleo Award winner from the American Concrete Institute (ACI). The award, given by the ACI Concrete Research Council, honours exemplary teaching, research and service to the profession in the areas of durability of concrete, properties of concrete-making materials and preparation of standards and specifications.

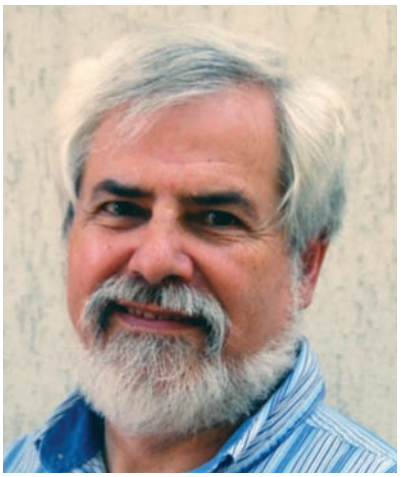
Yu Sun, PhD, P.Eng., and David Sinton, PhD, P.Eng., both professors, mechanical and industrial engineering, U of T, have been elected fellows of the American Society of Mechanical Engineers (ASME) for their engineering achievements and contributions to the engineering profession. Sun is known as a global leader in the development of micro-nano robotics and device technologies for biomedical, clinical and precision instrumentation. Sinton, who is director of the Institute for Sustainable Energy, focuses his research on the study and application of small-scale fluid mechanics for use in energy systems and analysis. Fellowship is the highest elected grade of membership within ASME.

Michael Carter, PhD, LEL, professor, department of mechanical and industrial engineering, and director, Centre for Research in Healthcare Engineering, U of T, has been elected a fellow of the Institute for Operations Research and the Management Sciences (INFORMS) for his lifetime achievement in operations research/management sciences. Carter's research focus is on health-care resource modeling in hospitals, home care, rehabilitation, long-term care and mental health, and he is involved in several research projects forecasting the demand for health-care professionals, provincially and nationally, and the infrastructure needed to support them. INFORMS is the largest professional society in the world for professionals in the field of operations research, management sciences and analytics.

Catherine Karakatsanis, P.Eng., FEC, chief operating officer, Morrison Hershfield, has been named one of the 2013 Canada's Most Powerful Women by the Women's Executive Network. The Top 100 Awards celebrate the professional achievements of women across the country in the private, public and not-for-profit sectors. Karakatsanis is recognized for her leadership and success in the engineering sector, particularly her progressive career at Morrison Hershfield, where she has worked her way up through a number of roles with extensive engineering and management experience. Karakatsanis is also the immediate past president of Engineers Canada, a former PEO president, board member with Engineers Without Borders and the Hellenic Heritage Foundation, and chair of the faculty of engineering advisory council for Western University.

Mario Kani, P.Eng., is one of three Canadians to be honoured with a Sustainable Buildings Canada Lifetime Achievement Award for his contributions to creating a more sustainable built environment. President of Sustainable EDGE Ltd., Kani is regarded as one of the foremost experts in green buildings and has helped to create some of the most cutting-edge, low-energy buildings in existence today. His expertise includes efficient and durable envelope design, highly efficient and alternative mechanical designs and technologies, and sustainable community energy systems. The award's founder, Sustainable Buildings Canada, has since 2002 sought to educate, support and empower building professionals and policy-makers in Canada, and aims to be the leading national agency for Canadian professionals seeking to create sustainable buildings.

Norm Huggins, P.Eng., was honoured with the Beaubien Award at the annual Canadian Consulting Engineering Awards gala, a joint initiative of the Association of Consulting Engineering Companies–Canada (ACEC) and C*anadian Consulting Engineer* magazine. Huggins was recognized for his outstanding contribution to the consulting industry and engineering profession. He has volunteered his service to ACEC and Consulting Engineers of Ontario since 1972, advocating in the interest of engineers to governments, clients and the public. Throughout his career at CH2M Hill, he has also dedicated his time and effort with the Toronto and Ontario chapters of the Engineering Institute of Canada and the Pollution Control Association of Ontario. The Beaubien Award was created by ACEC in 1984 in honour of James de Gaspé Beaubien, who founded ACEC in 1925.



Mario Kani, P.Eng., is one of three Canadians to be honoured with a Sustainable Buildings Canada Lifetime Achievement Award.

Norm Huggins, P.Eng., (right) is presented with the Beaubien Award from ACEC–Canada Chair Jason Mewis, P.Eng., at the Canadian Consulting Engineering Awards gala.

U of T engineering graduate Samah El-Tantawy has been given two prestigious international awards for her PhD thesis on developing a smart traffic light control system, which uses game theory and artificial intelligence to "teach" lights in real time how to adjust to traffic patterns. Her dissertation won first place in the best PhD dissertation competition of the Institute of Electrical and Electronics Engineers' Intelligent Transportation Systems Society. El-Tantawy was also a finalist for the George B. Dantzig Dissertation Award from INFORMS. Σ

Consistent approaches to regulation–a better way to serve public interest?

The Canadian Framework for Licensure is an ambitious, long-term project aimed at reducing the diversity of regulatory practices among engineering regulators across the country in favour of a more consistent, nationwide approach.

By Michael Mastromatteo

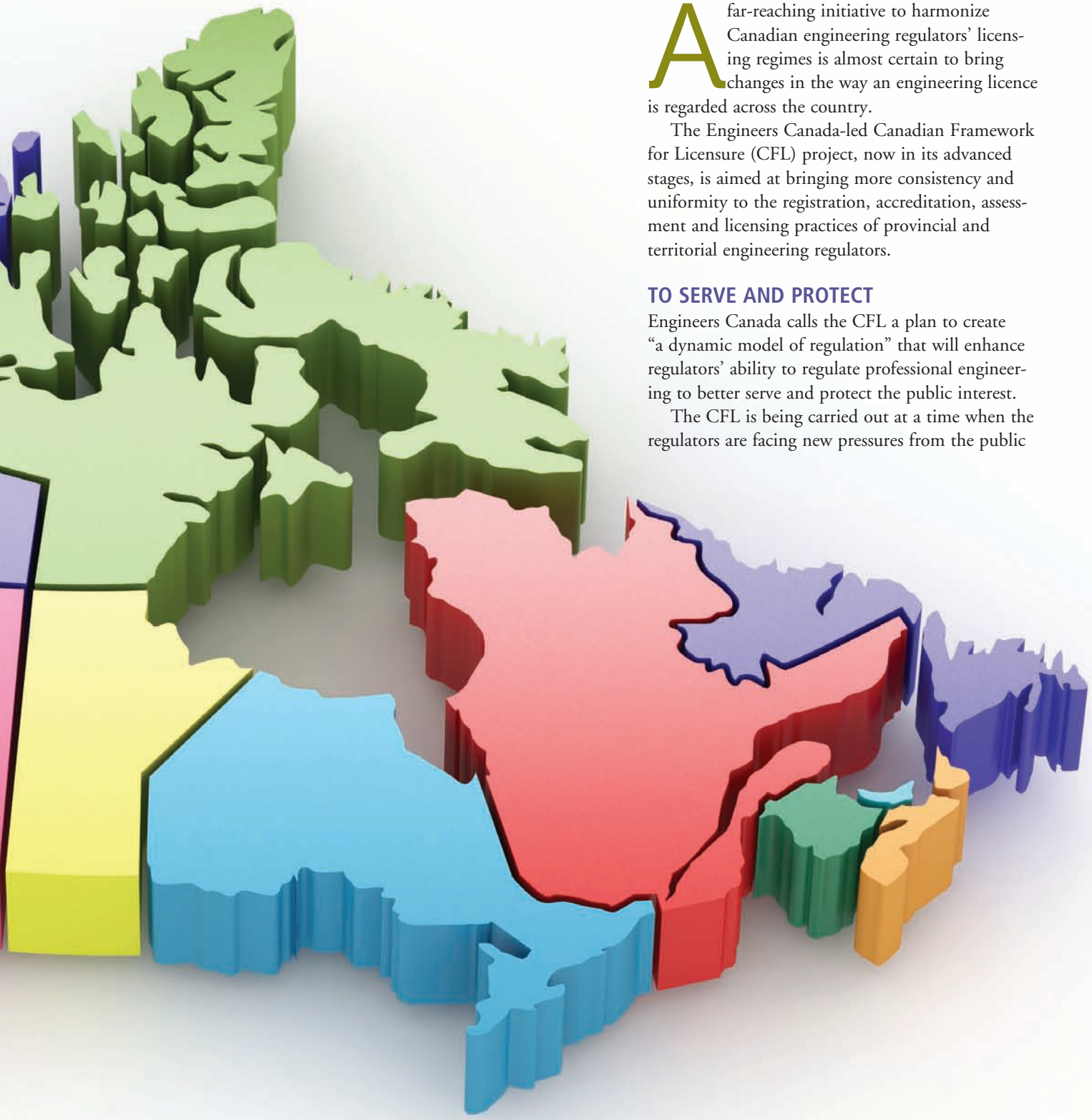
A far-reaching initiative to harmonize Canadian engineering regulators' licensing regimes is almost certain to bring changes in the way an engineering licence is regarded across the country.

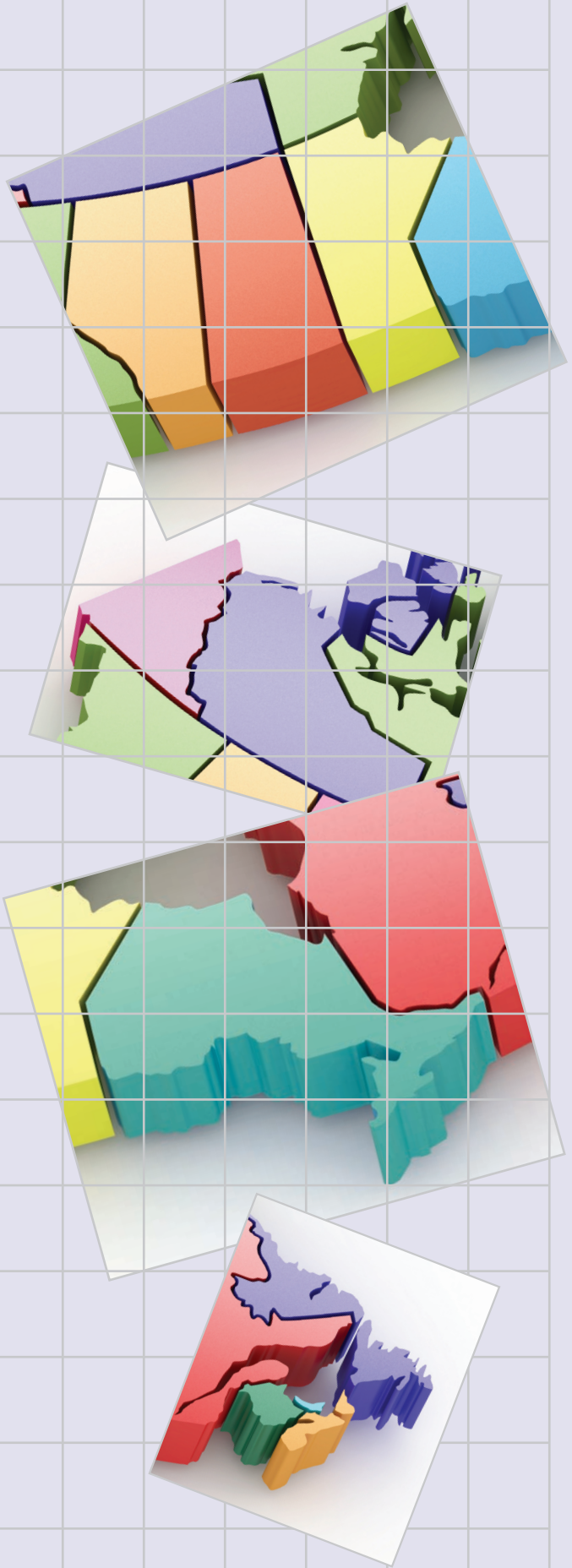
The Engineers Canada-led Canadian Framework for Licensure (CFL) project, now in its advanced stages, is aimed at bringing more consistency and uniformity to the registration, accreditation, assessment and licensing practices of provincial and territorial engineering regulators.

TO SERVE AND PROTECT

Engineers Canada calls the CFL a plan to create "a dynamic model of regulation" that will enhance regulators' ability to regulate professional engineering to better serve and protect the public interest.

The CFL is being carried out at a time when the regulators are facing new pressures from the public





and licence applicants to demonstrate transparency, accountability and fairness in their operations, and governments are mandating increased mobility of professionals across provincial boundaries.

To develop the CFL, volunteers are developing a series of "foundational documents" covering elements of licensing and regulation, which are circulated to Engineers Canada's constituent associations (CAs) for comments. Eventually, the CAs are asked to concur with continuing development of the policy direction and key considerations of the element, via a council motion. Once elements are finalized, CAs may incorporate them into their practices or legislation as they are able to.

WHAT IT COVERS

The CFL focuses on the essential aspects of regulation, including admissions, discipline processes and continuing professional development.

Each aspect is called an "element" of the framework. The elements are based on research of regulatory best practices. Key considerations and implementation details for each element are developed collaboratively, with extensive input from the engineering regulators. When finished, these elements will form a national framework–a model that is available to any engineering regulator that wishes to amend legislation, bylaws or regulations.

Stephanie Price, P.Eng., Engineers Canada manager of qualifications, says the CFL is progressing well, with many of the project's endorsed elements on their way to becoming operationalized through "implementation documents."

PROVINCIAL ASSOCIATION BUY-IN

Price describes the implementation documents as blueprints for turning high-level key considerations into programs and processes that CAs, including PEO, can use in their daily operations.

Those guiding development of the CFL are now awaiting feedback from the CAs on the core functions of each engineering regulator. Among these are principles for complaints, investigations and discipline, complaint and investigation practices, the definition of the practice of professional engineering, objects of the engineering act, public identification of engineering expertise, and standards of professional conduct.

It's expected that responses on these elements will be on the agenda for Engineers Canada's February 2014 chief executive officers meeting.

CAs' endorsement/concurrence of finalized foundational documents on enforcement practices and the Code of Ethics are due at Engineers Canada by January 2014, while acceptance of the foundational document on titles, rights and responsibilities is due in February.

CLC TASK FORCE

PEO's participation in the CFL falls largely to a task force chaired by former president Diane Freeman, P.Eng., FEC. In a November interview with *Engineering Dimensions*, Freeman said the CFL has several key drivers. "The hope is that increased consistency [among regulator practices] will improve public safety overall," she said. "This would be achieved through regulating similar high standards throughout Canada."

She added that federal and provincial mobility legislation is requiring licensed engineers be enabled to move more freely across Canada and be licensed in new jurisdictions with fewer restrictions. "Ensuring consistently high standards for assessing the depth and breadth of academic and experience requirements across Canada will ultimately ensure that all engineers are licensed based on the same standards," she says.

Freeman also suggested the CFL could bring more consistency to regulators' complaints and discipline practices, lessening the perception that differing licensing requirements have led to differently qualified practitioners.

"There is a perception that it is easier to be licensed in some jurisdictions than others and that this ease results in potential public safety issues," Freeman said. "I do not believe there is tribunal evidence to support this perception. Under the CFL, if provinces move to a more consistent framework of regulation, however, this perception can be reduced and possibly eliminated."

MORE SUPPORT

Len White, P.Eng., CEO/registrar, Engineers Nova Scotia, says talk of licensing practice uniformity has gone back more than 10 years. He says overviews of basic registration processes identified a number of areas where regulators could become more responsive to the needs of applicants and members.

"The CFL project is an attempt to resolve those differences while developing a set of best practices for the engineering regulatory bodies," White says. "Those best practices are developed nationally, and can be adopted by the provincial and territorial licensing bodies at their discretion. The goal at the end of the day is to build public confidence in the regulation of professional engineering, while facilitating the convergence of provincial legislation and making both licensing and enforcement easier and more effective."

White cites the case of regulators adopting individual codes of ethics. "This has always puzzled me. Try explaining to the general public why professional ethics should be different in every province! Some would counter that this is driven by differences in provincial legislation across Canada, but I really don't think that's a good answer." White adds: "Through the CFL project, a new national model Code of Ethics has been developed and is being considered by all of the associations. Nevertheless, we still have much more work to do in developing a consistent national system for engineering licensure."

MANY BENEFITS

Mark Flint, P.Eng., CEO, Association of Professional Engineers and Geoscientists of Alberta (APEGA), agrees there are many benefits that could flow from a more cohesive and coordinated set of registration and licensing practices for all Canadian engineering regulators. "From Alberta's perspective, it's fair to say there is a large degree of support, both from me personally and from most of our council, to work towards an extremely mobile system in which people can move across the provinces quickly and without unnecessary bureaucratic encumbrance," Flint told *Engineering Dimensions*. He likened the proposed national type of engineering licence to a driver's licence, giving holders the right to practise outside their geographic boundaries by satisfying an agreed-upon set of conditions.

SAME LEVELS OF TRAINING AND COMPETENCE

"We're trying to ensure the public interest is best served and I think, in this particular case, the CFL serves that interest by enabling our people to do their work quickly and easily, but also by trying to reassure the public that a qualified member in one province has the same level of training, competency, and education and skill as somebody from another province," Flint says.

Flint suggests, however, the work toward a CFL could be impeded without full buy-in from each engineering regulator across the country.

Meanwhile, the CFL is moving forward by researching regulatory best practices in such areas as discipline procedures, a code of professional conduct, and appeals of regulatory decisions. Future elements of the framework under development include:

- supervision of engineers-in-training;
- licensing, other–identification, life members, reduced fees;
- governance;
- disclosure of information in the public interest;
- geographic jurisdiction of enforcement and discipline;
- discipline and inter-association applicants–refusal to admit due to discipline;
- fee-setting power;
- relationships with other professions; and
- use of the engineering seal.

Ultimately, it is hoped the CFL will be a model of best practices for engineering regulation, says Engineers Canada, referencing all aspects of regulation and serving as a resource for the CAs. It's also hoped the effort will help to build public confidence in the regulation of engineering, promote renewal of the profession, and increase the effectiveness of enforcement and discipline activities. Done right, the CFL should also better protect the Canadian public through consistent regulation, even as licence holders enjoy full mobility across the country.

More information about the CFL is available at www.engineerscanada.ca/status-report. Σ

What's in store for the Canadian experience requirement?

Regulators across all professions are under pressure to justify Canadian experience as a requirement for licensure. Here are views on both sides of the debate. By Michael Mastromatteo

The acquisition of 12 months of experience in a Canadian jurisdiction under the supervision of a person legally authorized to practise professional engineering in that jurisdiction (commonly referred to as the Canadian experience requirement) as a requirement for licensure as a professional engineer in Ontario is coming under increased scrutiny, as such requirements are for all regulated professions.

All the requirements for licensing as a professional engineer–at least 18 years of age, a bachelor's degree from an accredited Canadian engineering program or equivalent engineering educational qualifications recognized by PEO council (which may involve the passing of exams), 48 months of acceptable work experience, passing the professional practice examination, ability to communicate adequately in English, and good character–have all been challenged from time to time. It's the Canadian experience requirement that PEO and other Canadian engineering regulators are called on to justify most often and currently.

Under section 33(2) of Regulation 941/90, experience acquired outside Canada can satisfy PEO's Canadian experience requirement if the applicant is employed by a company whose head office is located in Canada and is supervised by a person licensed to practise engineering in Canada, and the experience, in council's opinion, provides the applicant the necessary practical skill and sufficient familiarity with the applicable Canadian codes, regulations and standards for the practice of professional engineering.

However, increasingly, it is being suggested the requirement for Canadian experience to obtain registration in or a licence to practise a regulated occupation is a form of discrimination–one that could be subject to a human rights challenge. In fact, the Ontario Human Rights Commission (OHRC) recently released a position statement calling on Ontario's self-regulated professions to relax their Canadian experience requirements, except in very rare circumstances. The OHRC statement echoes earlier pronouncements by the Ontario Fairness Commissioner that the requirement is an artificial and outdated concept. The office of the fairness commissioner was established in 2007 as an outcome of the *Fair Access to Regulated Professions Act* to ensure the credentials of internationally trained professionals are evaluated fairly and transparently for registration.

While some PEO members, including those educated outside Canada, are in favour of the Canadian experience requirement to serve and protect the public interest, other voices suggest a competency-based system might serve the same purpose. In fact, Engineers Canada, the federation of Canadian engineering regulators, is working with the Association of Professional Engineers and Geoscientists of British Columbia on a project to define the expected outcomes of the Canadian experience requirement for licensure. Engineers Canada officials believe it will be necessary in the future to move from a requirement that is time-bound (i.e. 12 months of experience) to one that articulates the outcomes required for licensure. Engineers Canada believes that competency-based assessment may provide the necessary levels of specificity and clarity to be more easily understood as a requirement.

To further the discussion, *Engineering Dimensions* presents this brief snapshot of opinions both in favour of, and opposed to, the Canadian experience requirement for licensing.

IN FAVOUR OF THE CANADIAN EXPERIENCE REQUIREMENT

Ravi Gupti, P.Eng., FEC, vice chair, PEO's Experience Requirements Committee, and an internationally educated engineer:

"We have a certain bar of admission to the profession and rather than lowering that bar, we want to raise it, and that can only be done through our own standards and our own codes, because otherwise uniformity would not be possible. If global engineers just say, 'we have standards and codes all over the world' wherever they come from, it's not possible to measure them against a certain benchmark…We want to maintain Canadian experience for one year as a requirement so that we can measure most of the international graduates who come from different educational institutions. Then we bring it to a common parameter to measure their experience against. That perhaps will be in totality the justification of Canadian experience."

John Boyd, PhD, P.Eng., former president of International Federation of Consulting Engineers and advisor to the federal government on infrastructure-related trade issues:

"The Canadian experience requirement is not discriminatory in the slightest. First of all, every engineer, whether trained here or elsewhere, is required to have Canadian experience prior to licensing. Perhaps those raising the clamour should revisit the meaning of the word discriminatory–you discriminate when one group is required to do something that another group is not required to do.

The human rights and fairness commissioners don't seem to understand that their quality of life in Canada is protected by such requirements. Canadian experience ensures the professional is familiar with our codes and regulations and, above all else, with our climate, which requires certain approaches to deliver successful engineering projects. To call this discriminatory is equivalent to saying you can successfully cope with life in another country without any familiarity with the laws of that country.

Having said all that, we could replace the experience requirement with training, coursework and examination, but there would need to be a significant effort to create and teach such a curriculum and it would be expensive. At the end of the day, the impact on licensees would be similar and the costs would be significantly higher."

CONCERNED ABOUT THE CANADIAN EXPERIENCE REQUIREMENT

Barbara Hall, chief commissioner, Ontario Human Rights Commission:

"At the commission, we heard from many people that they find themselves in a catch-22 situation. They might have all the appropriate experience but it's not obtained in Canada. They can't get Canadian experience because they can't get a job, and they can't get a job because they don't have Canadian experience. And yet they may have all the skills and qualifications that the position requires, so that should be the test–what are the actual skills and competencies that the employer or the profession requires? Set them out and then provide opportunities for applicants to show whether or not they can meet them. In most cases, the requirement for 'Canadian experience' is an unnecessary barrier that often prevents immigrant professionals from realizing their potential, and employers from capitalizing on a larger pool of qualified candidates."

Hon. Jean Augustine, PC, CM, fairness commissioner, Province of Ontario

"Since 2007, I have been challenging governments and regulatory bodies to look into barriers to professional licensing. My office has certainly run into the dilemma of 'Canadian work experience.'

That's why I welcomed the policy put forward by the Ontario Human Rights Commission.

Of the 38 professions that licensed applicants in 2012, 26 required work experience or practical training before licensing. Of those 26, 15 required Canadian experience, including six that specifically require Ontario experience.

Often this is a real barrier, especially in a challenging economy.

Why, in this global economy, is overseas experience considered less valuable than domestic experience? The fair access law requires regulators to justify their requirement. It has to be relevant and necessary.

Regulators have to ask themselves this question and provide a solid rationale for their requirement."

IN FAVOUR OF THE CANADIAN EXPERIENCE REQUIREMENT

Asif Khan, P.Eng., industrial engineering manager, Chrysler LLC, and an internationally educated engineer:

"From my personal experience, I strongly feel that PEO has a transparent, objective, impartial and fair licensing practice.

I don't have any concerns relative to my personal experience of obtaining a licence back in 2004. I took time to understand the requirements once I submitted an application. I then started meeting the requirements step by step. Nowhere during the process did I experience any surprises or disappointments.

Most of the applicants find difficulty acquiring Canadian experience. The problem is twofold:

- Being a newcomer to Canada, there is a low possibility of finding work; and
- People who do find work might not understand the potential of fulfilling Canadian engineering experience. At times they won't find a licensed professional engineer to verify the experience.

An aggressive outreach effort to educate internationally trained engineers can help improve the processes and relieve some of the frustration. Programs like EIT and licensing preparedness programs offered by PEO are great initiatives to help foreign graduates."

Stephanie Price, P.Eng., manager of qualifications, Engineers Canada:

"There is no argument that there are legitimate requirements related to engineering work in a Canadian environment. These are both technical (e.g. use of Canadian codes, allowances for Canadian climate) and social (e.g. the nature of multicultural Canadian teams). Competency assessment offers an option to redefine and retain these requirements in a form that is compliant with emerging legislation. By doing so, the competency-based assessment system will allow us to maintain high standards of licensure while ensuring that we meet the requirements of human rights and fairness commissioners."

CONCERNED ABOUT THE CANADIAN EXPERIENCE REQUIREMENT

Mansoor Ali, P.Eng., senior development engineer, City of Markham, and an internationally educated engineer:

"When I immigrated to Canada in 2003, the most important task I wanted to accomplish was to get back into the engineering field. With over 18 years of experience in Pakistan, it was difficult for me to get an engineering job in Canada, as I do not possess the required designation of P.Eng. and, without the Canadian experience, no one was ready to hire me.

I was lucky to get an internship through the Career Bridge program and through which I was able to get the required Canadian experience and thus was able to fulfill the requirements and got my P.Eng. designation within 18 months of my arrival in Canada.

However, not all immigrants are lucky enough to get internships and they struggle to get their Canadian experience and in the process sometimes end up in jobs other than engineering. If this one year of experience is relaxed, it would be beneficial to many immigrant engineers. The important questions that come to my mind are:

- How we can break this unproductive cycle of no Canadian experience?, and
- How can we provide a crucial bridge between new immigrants and the workplace that eliminates significant employment barriers often faced by qualified, experienced professionals?"

Council for Access to the Profession of Engineering (CAPE), an advocacy organization for internationally educated engineers:

"The legislated control over the title of professional engineer (P.Eng.) means new immigrants possessing engineering qualifications, including those who have received a professional engineering accreditation overseas, lose this accreditation when they arrive in Canada.

In order to practise engineering in Canada, immigrants must navigate a foreign credential recognition process fraught with barriers to success. Engineering associations do not publicly document what criteria constitute Canadian experience. An applicant doesn't know what he or she is going to be judged against. This is a fundamental problem.

CAPE has adopted the position that knowledge [of Canadian codes and standards of practice] can be acquired through simulated teaching or self-learning as is the case in the rest of the world."

IN FAVOUR OF THE CANADIAN EXPERIENCE REQUIREMENT

Rakesh Shreewastav, P.Eng., FEC, PEO council member, a PEO director on the Engineers Canada board, and an internationally educated engineer:

"There is a perception among some internationally educated professionals [IEPs]–often a negative one–regarding Canadian experience.

PEO needs to be able to demonstrate that it is not something that is a barrier in realizing IEP potential, but a positive way that this is the experience you get working under the supervision of an engineer with a P.Eng. licence.

[The requirement is] designed to get experience you need to integrate into the engineering profession in Ontario and Canada.

This helps in a number of ways, such as better understanding of codes, ethics and workplace culture. Other benefits may include the understanding of challenges, appreciation of diversity and multiculturalism, and broader communications.

Overall, it contributes to the value-added experience that IEPs get during this 12-month period and ensures the integrity of the profession, the main purpose of which is to protect public interest."

CONCERNED ABOUT THE CANADIAN EXPERIENCE REQUIREMENT

Izumi Sakamoto, PhD, associate professor, Factor-Inwentash faculty of social work, University of Toronto, and a contributor to the Ontario Human Rights Commission's policy statement on removing the Canadian experience requirement:

"I have been researching the notion of 'Canadian experience' for the past seven years and have recently joined with other community-driven initiatives to form the Beyond Canadian Experience Project. Our main purpose is to deconstruct the idea of Canadian experience with the goal of reducing barriers to employment experienced by immigrants. Our research concludes that the Canadian experience implied by employers is often not about professional standards, but cultural ones: immigrant workers have no experience at being Canadian, and don't fit in at the workplace. Everybody needs to learn particularities of the cultural environment to some degree, and to adapt in a new context. As an industry or an employer, it is important to support their transition, whether it's a new graduate or an experienced newcomer professional. However, the emphasis on Canadian experience has disproportionately amplified the importance of cultural adaptation to the extent that it is used as a euphemism to perhaps discriminatory sentiments; that is, believing immigrants are somehow less than Canadian-borns in their qualifications, talent and competencies. OHRC's new policy on removing the Canadian experience barrier is a huge step toward addressing the employment gap immigrant professionals experience in Canada."

NEW HOUSES vs. OLD DESIGN PROVISIONS

By Hamid Emami, MSc, P.Eng., and Jassem Saeidi, MSc, PMP, P.Eng.

THOUSANDS OF SMALL HOUSES are being built in our municipal areas every year. Obviously, the safety and stability of these small buildings are of paramount concern.

Part 9 of the National Building Code of Canada (NBCC) (www.nationalcodes.nrc.gc.ca/eng/nbc/), provides a prescriptive design solution for small wood-frame buildings within its limitation. Part 9 is derived from a combination of calculated designs and solutions based on performance history. It is developed as a simple reference, which allows a designer to practise building design within the limitations without the assistance of an architect or engineer.

LATERAL RESISTANCE

The lateral resistance of wood-frame buildings is an important issue in their safety and stability. Part 9 does not adequately address the lateral resistance of these buildings, however. The Ontario Building Code (OBC)(www.e-laws.gov.on.ca/html/regs/english/elaws_regs_060350_e.htm), in its proposed 2010 revision A-9.4.1.1(3), pointed out that "the only explicit treatment of structural loads in section 9.4 is for gravity loads; wind and earthquake loads are dealt with implicitly in the body of part 9 and are not used as inputs to any of the span tables," and it also confirms that "Part 9 buildings are not exempt from having to comply with the wind and earthquake loading requirements of Part 4." This important amendment was not included in the final version of the new 2012 OBC.

The Canadian Wood Council's (CWC) *Engineering Guide for Wood Frame Construction* (http://webstore.cwc.ca/technical-books/egwf09e-engineering-guide-for-wood-frame-construction-2009) also states that "many wood frame buildings based only on the part 9 prescriptive requirements would appear to be inadequate for resisting lateral loads; however, performance history indicates that this is not the case." It appears that the lateral resistance of a building relies on shear resistance of a minimum length of exterior walls and the contribution of non-structural elements, such as interior finishes, exterior cladding and non-load-bearing partitions.

The CWC guide also addresses the structural requirements for buildings designed under part 9. Even though the guide is used as a complement to part 9, in most cases, it can't help non-engineer designers to go further than the prescriptive method, which completely relies on the historical performance of "prototype" field-tested buildings in terms of lateral resistance and stability of traditional wood-frame buildings.

"SOME WOOD FRAME BUILDINGS COVERED BY PART 9 DIFFER SUFFICIENTLY FROM NORM THAT THEY CANNOT BE COUNTED ON TO DEMONSTRATE SIMILAR PERFORMANCE IF THEIR DESIGN IS BASED ONLY ON THE PRESCRIPTIVE PROVISIONS OF PART 9."

CWC *Engineering Guide for Wood Frame Construction*

MODERN DESIGNS

New developments in building materials, such as engineered woods, have reduced the restriction and limitation of designs in matters of span, supporting area, building height and area of openings. These lessened restrictions have also changed the demands of designers and house owners significantly. Modern houses in Canada do not resemble traditional wood-frame houses. The CWC guide's 2009 edition states that "some wood frame buildings covered by part 9 differ sufficiently from norm that they cannot be counted on to demonstrate

similar performance if their design is based only on the prescriptive provisions of part 9." Modern houses have fewer interior partitions and are taller than traditional houses. They are often built on narrower lots with more critical height over width ratio than before. The historical performance of wood-frame houses can't adequately ensure the stability and safety of these houses. This is an important clarification that has been recognized in many other provinces and in the National Building Code of Canada (NBCC) for many years.

The *Professional Engineers Act* gives PEO the authority to regulate the practice of professional engineering and govern its members in order "that the public interest may be served and protected." PEO is generally expected to determine the standard of practice for Ontario engineers, especially when it is directly related to the health and safety of the public.

Every year, thousands of design proposals are submitted to the province's building departments to obtain building permits for new buildings. Many of the new house designs have open plans with very few or no interior walls. Many of these buildings could be inadequate to resist lateral loads and may not comply with part 4 of the OBC or the CWC guide. They do not fit in the category of traditional wood-frame houses, although they have performed well during the past few decades despite the fact that their stability analysis does not correspond to part 4 of the building code.

SAFEGUARDS LACKING

There are insufficiencies in part 9 of OBC that have been recognized by different professional associations, such as the Professional Engineers and Geoscientists of BC, the NBCC and the CWC guide. In the past few years, several proposals have been submitted for next editions of the OBC. Surprisingly, they were not included in the 2012 OBC despite the formal recognition of the arguments and despite having any experimental results that apply to new house designs.

The *Guidelines for Professional Structural Engineering Services for Part 9 Buildings in British Columbia* Version 2.0 (https://www.apeg.bc.ca/getmedia/f0fca87d-c089-4c22-a45d-908f187b5076/APEGBC-Guidelines_for_Structural_Engineering_Services_for_Part_9_Buildings.pdf.aspx) requires APEGBC members to evaluate and mitigate the vulnerability of the primary structural system to lateral loads. The guidelines state: "in fact, if only the prescriptive provisions are followed, a modern-style Part 9 building in a high-hazard region (wind or seismic) will likely have compromised sway resistance due to open layouts with few if any interior walls and/or exterior walls very significantly interrupted by many large windows or doors."

Despite all the evidence, part 9 of the OBC is still lacking in provisions to safeguard many of the modern open-plan-design buildings against lateral forces. More importantly, the mechanism for detecting dangerous designs is not in place. House designers are very often non-engineers. In Ontario, the designers who have obtained Building Code Identification Number (BCIN) certification can design a house within the limitations of part 9. They are clearly not engineers and not able to consider the possible need for lateral resistance provisions beyond part 9. The same situation exists in the building departments where non-engineers examine the engineering requirements of modern house design.

DESPITE ALL THE EVIDENCE, PART 9 OF THE OBC IS STILL LACKING IN PROVISIONS TO SAFEGUARD MANY OF THE MODERN OPEN-PLAN-DESIGN BUILDINGS AGAINST LATERAL FORCES. MORE IMPORTANTLY, THE MECHANISM FOR DETECTING DANGEROUS DESIGNS IS NOT IN PLACE.

CONVERSATION NEEDED

We propose a dialog within the engineering community to discuss and suggest necessary changes to the OBC relating to the areas discussed. We also feel strongly in identifying the engineering elements of building design in part 9 of the OBC, which should be designed and controlled by engineers.

We feel that PEO is taking the appropriate measures in the case of the Elliot Lake building collapse. PEO has suggested that the OBC be amended to reference "structural adequacy reports." It is obvious that PEO will make its best effort to make sure our buildings and their occupants are safe, regardless of the size of the buildings. Σ

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ENGINEERS AS POLITICIANS: IT'S IN THE PUBLIC INTEREST

By Howard Brown and Kaitlynn Dodge

FOR THE LAST NUMBER OF YEARS, Professional Engineers Ontario has been encouraging engineers to become more involved in politics through its Government Liaison Program and through the Ontario Centre for Engineering and Public Policy, because there is a shortage of engineers and people with science and technology backgrounds in the legislature.

The project, which started as an aspirational concept to have 11 engineers elected in 2011, has driven a growing conversation in the engineering community about why it's important for the members of the profession to use their skills in public office.

With four professional engineers elected to Canada's House of Commons (MPs Corneliu Chisu, P.Eng., FEC, Marc Garneau, P.Eng., Pierre Lemieux, P.Eng., and Steven Blaney, P.Eng.) and three who have seats in Queen's Park (MPPs Phil McNeely, P.Eng., Jack MacLaren, P.Eng., and Jim McDonell, P.Eng.), there is room for more engineers to step up to the plate. Sadly, one of the engineers at Queen's Park, MPP McNeely (Ottawa-Orléans), has announced his plans to retire when the next election is called.

PEO's Mississauga Chapter recently hosted a well-attended event for licence holders, entitled Engineers as Politicians. The session was designed to give engineers who are currently elected or who have previously run for election an opportunity to share their experiences.

One of the speakers was the House of Commons' most recently elected engineer, former PEO vice president and Pickering-Scarborough East MP Corneliu Chisu.

"I always believed that if you would like to change the world, then you need to be an engineer," Chisu told seminar attendees.

"As we seek to develop our country and to ensure our people's well-being in an increasingly complex and interdependent world, I truly believe that engineers will need to play a greater role, not merely in designing and constructing tangible products, processes and structures, but also in promoting a culture of quality, sustainability, ethical standards and use of their practical knowledge to help governments understand choices and the most effective means to get things done."

Chisu's passion for the subject was evident. He wants to see more engineers playing a public role.

You could argue that the primary function of the House of Commons is in drafting laws, and those with legal backgrounds are best suited to serve. However, Chisu believes there is a strong argument for individuals with an engineering background to tackle pressing environmental issues, understand and address infrastructure needs, revive the domestic manufacturing sector, and more. These all require the technical expertise and savvy problem solving of the engineering mind.

"This is why it is crucial that engineers be involved in government–to provide experienced counsel on issues that are critical to the well-being and health of our nation and its future," Chisu said.

Former Mississauga-Erindale MP Omar Alghabra, P.Eng., also participated in the session and shared some of the things he learned while in public office. Quoting Mississauga Mayor Hazel McCallion, Alghabra simplified the political system, saying: "The feds have the money, the province has the authority, and municipalities have the responsibility." He reflected on his time growing up in the Middle East. He said he understood the importance of getting involved politically after moving to Canada as a teenager from a country with limited political freedom.

Mississauga City Councillor Ron Starr, P.Eng., shed light on why he decided to run, putting weight on contributing his engineering thought process in politics to make a difference. After serving many years ago, Starr said he ran again for three reasons. He said he wanted to "bring civility back" to politics, "address gridlock" and "show value for taxpayers."

Two engineers who ran among the 11 P.Eng. MPP candidates in 2011 shared some words of wisdom to engineers looking to get involved.

Former Richmond Hill NDP candidate Adam DeVita, P.Eng., said: "You should be involved in politics because it is important and meaningful."

Former Toronto-Danforth provincial Liberal candidate Marisa Sterling, P.Eng., who is also PEO's lead on the industrial exception repeal, encouraged participants to take action: "Donate a dollar or even $5 to a political cause; write about something that you care about and back it up with why it's important." Sterling was a page in the Ontario legislature when she was in grade 8, and credits this early exposure with getting her engaged in the political process.

Of those who participated in the seminar, 84 per cent said that they would "think about getting more involved, will find a way to get more involved, or can't wait to get more involved." Three issues were most important to participants: public transit (63 per cent), energy (57 per cent) and the environment (43 per cent). Thirty-two per cent of participants were 35 years old or younger.

It's clear with numbers like these that the future of engineers in politics is bright. Σ

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A QUESTION OF PRIORITY AND POLICY IN MELANCTHON: AGRICULTURE OR AGGREGATE?

By Mary Gallerneault

ONTARIO CENTRE FOR ENGINEERING AND PUBLIC POLICY

THE HIGHLAND COMPANIES (THC) began its acquisition of roughly 3400 hectares of agricultural land in the Township of Melancthon in 2006. The region is ideal for the growth and cultivation of potatoes due to its cooler climate, well-draining soil and absence of stones. This ideal agricultural land is identified in the provincial policy statement (PPS) as an area that shall be protected for long-term agricultural use. Despite this identification, in April 2011 THC applied for a licence through the *Aggregate Resources Act* (ARA) to extract aggregates from the township by developing the largest quarry of its kind in Canada. Although THC ultimately withdrew its application in November 2012, the current PPS still allows similar applications and, until policies are updated, there remains a significant threat to agricultural land across Ontario. Conflicting statements regarding environmental stewardship versus economic development in the PPS and the ARA highlight the need for review and amendment to existing public policy to ensure Ontario's long-term agricultural and economic prosperity.

MODERN MELANCTHON

Melancthon Township is located approximately 100 kilometres northwest of Toronto in Dufferin County. In 2006, Dufferin County generated $103.8 million in gross farm receipts (Barnett), of which Melancthon Township accounts for 29 per cent. Melancthon is located 1700 feet above sea level and this unique geographic position provides an ideal microclimate for the production of 450,000 kilograms of potatoes each year (Holmes).

Recently, the PPS and the Canada land inventory (CLI) have identified these soils as belonging to a rare and extremely desirable agricultural soil classification. The soils in Melancthon are 10,000-year-old soils, called "honeywood silt loam," and are highly sought after due to their superior moisture retention and drainage, absence of rocks and good texture (Suzuki).

The Ontario Ministry of Agriculture and Food and the CLI have defined seven major types of soil in Ontario (Agriculture and Agri-Food Canada), with class 1 through 3 being the most desirable lands, referred to as "prime agricultural land." The soil in Melancthon Township is designated as class 1–the most desirable agricultural land. The importance of maintaining Ontario's class 1 agricultural soils is integral to Ontario's continued growth and development, as it provides essential commodities, jobs and food for a large segment of our population.

THE IMPORTANCE OF CLASS 1 SOILS

Only 12 per cent of Ontario's 89 million hectares of land is designated as class 1 to 3 soils. Of the class 1 soils, more than 50 per cent are concentrated south of the Canadian Shield, and these comprise some of Canada's best climatic areas. Among the commodities produced from class 1 soils are: 70 per cent of Canada's peaches, 98 per cent of Canada's grape production for wines, 33 per cent of Canada's dairy herd and 84 per cent of Canada's soybean crop. Ontario's 50,000 farms account for an impressive $9 billion, roughly 24 per cent of Canada's total gross from

farm receipts and, in the GTA alone, this directly accounts for 15,000 jobs and 35,000 agriculturally related jobs (Turvey and Konyi).

Since urban growth has expanded in the greater golden horseshoe area and is expected to continue to rise, there has been a loss and fragmentation of Ontario's farmland. As urbanization increased, there was a push in 1975 for Ontario to do more to protect farmland. This culminated in the Foodland Guidelines of 1978, a government policy that was ultimately consolidated with the *Planning Act* of 1983, and became the PPS in 1997, which was revised in 2005. The PPS is a statement of Ontario's interests in land-use planning, which recognizes the province's need to protect prime agricultural land for long-term agricultural use. The intent of the PPS is that municipalities should implement these policies through local planning documents and development applications.

HEADWATER FARMS AND THC

In 2006, John Lowndes, a civil engineer, began purchasing significant areas of farmland in Melancthon Township under the name Headwater Farms. In the process of buying land, Headwater Farms acquired two large potato farms: Wilson's and Downey's, and subsequently became Ontario's largest potato producer at 45.5 million pounds a year (Williams). The soil of Melancthon Township is extremely rich, but perhaps not as rich as the resources below ground, where is contained the largest deposit of Amabel dolostone in Ontario.

In 2009, THC held an open house in Melancthon and outlined plans for developing a quarry over 937 hectares of prime potato farming land. THC stated that the quarry would be dewatered using a dewatering, recharge and recycling system, and THC maintained that the soil profiles could be rebuilt so that farming might continue concurrently with excavation (Barnett).

THE *AGGREGATE RESOURCES ACT*

The amount of aggregate that will be necessary to maintain infrastructure development is estimated at an average of 186 million tonnes a year for the next 20 years. Limestone and other aggregates are therefore defined as a priority in this province, according to the PPS. The governing of aggregate resources, such as those in Melancthon, is not only managed by the PPS, but also by the ARA, which is responsible for setting aggregate extraction standards, issuing application approvals and conducting enforcement actions. The purpose of the ARA is to:

- provide for the management of the aggregate resources of Ontario;
- control and regulate aggregate operations on Crown and private lands;
- require the rehabilitation of land from which aggregate has been excavated; and
- minimize adverse impact on the environment in respect of aggregate operations (Ministry of Natural Resources).

The PPS outlines in section 2.5 the need for a stable and close-to-market source of aggregates to keep pace with development across the province. And, in 2010, it was determined that there are significant economic, environmental and social implications from shifting away from the "close-to-market" policy (Ministry of Natural Resources). In the same 2010 report, it was outlined that Ontario has "abundant and high quality aggregate deposits close to high demand area"; this makes Melancthon an ideally situated aggregate extraction site, as it is within reasonable market distance (roughly 100 kilometres from the greater Toronto area). Crucially, the report continues: "However, ninety-three per cent of unlicensed bedrock resources have overlapping environmental, planning and agricultural constraints."

A QUESTION OF POLICIES AND PRIORITIES

As detailed earlier, both the ARA and the PPS contain sections that highlight the importance of two resources: aggregates and agricultural land. Compare section 2.3.1 of the PPS, which states that agricultural land shall be preserved for long-term agricultural use, with section 2.5.1, which states that mineral aggregate resources shall be protected for long-term use. This is a clear example of the competing priorities found in the PPS, and there is no obvious divide between which resource should be protected at the expense of the other. The unclear wording of the PPS should be subject to review in the interest of creating a more cohesive series of policies on land use. The recommended amendments to the PPS should prioritize securing our food supply and ensuring Ontario's long-term agricultural viability by better refereeing land-use planning.

LOOKING FORWARD: SUGGESTED AMENDMENTS

The David Suzuki Foundation and the Nottawasaga Valley Conservation Authority objected to the quarry, citing environmental concerns. The concerns were predominantly directed toward the water-management strategy, as both authorities questioned the data-collection methods used by THC, claiming the variation of the water cycles with the seasons was not appropriately accounted for. It is well established that aggregate deposits, such as those found beneath Melancthon Township, serve as reservoirs for groundwater, and their removal can dramatically alter groundwater flow (Binstock). The impact on water variability would only exacerbate problems associated with truck traffic, aggregate extraction and processing, such as dust, which increases soil

alkalinity and coats crop foliage (Ontario Farmland Trust). Furthermore, it was found that insufficient consideration was given to the potential impacts to adjacent surface and ground water quantity, the fallout of which could contribute to the erosion of soils, fisheries and natural terrestrial systems (Keller). These concerns were further brought to light in the environmental assessment of the quarry; perhaps an update to the PPS could be made to include environmental assessments of large projects involving aggregate extraction, during which there is often concern about water contamination.

Given the extraction of aggregates, would the soil structure be irreversibly changed from compaction? Compaction leads to drainage problems, and the steep slopes that are characteristic of quarry sites are unsuitable for farming and cause drainage issues. Policy 2.5.4 relies upon the assumption that complete agricultural rehabilitation can be achieved on aggregate extraction sites, and thus provides exemptions for agricultural rehabilitation requirements. This reveals a short-sightedness in the policy and, in fact, encourages aggregate applications that could destroy Ontario's best farmland (Iler Campbell). Ontario's agricultural lands should not be open for experimentation as they are an invaluable source of food for our province and country. As stated in the Iler Campbell report, "a requirement for rehabilitation is poor policy when compared with protecting highly productive soils for food production." We must prioritize protection rather than recovery.

Resource extraction from sites such as Melancthon should not be considered a priority when compared to these sites' agricultural productivity; instead, aggregate resources should be extracted from areas of low environmental and agricultural impact. As Iler Campbell puts forth, "the aggregate resources below agricultural lands are not lost forever if their extraction is deferred to future generations"; however, the ability to feed future generations from our soil is deferred if the rehabilitation of prime agricultural soils is not guaranteed.

CONCLUSIONS

Although the application for the proposed mega quarry in Melancthon Township was ultimately withdrawn after extensive environmental review and public outcry, the current PPS and ARA prioritize land uses that are in direct competition with agriculture. Although aggregate extraction is certainly a priority in the interest of developing Ontario's infrastructure, it is unnecessary that resource extraction occur on some of the best farmland in Canada.

It is the duty of engineers to help ensure fully formed and coherent public policy is in place to ensure the sustainability and consistency of their projects. It is essential that engineers uphold their obligation to protect the public interest and prevent situations that might cause harm to the public–even at the expense of short-term economic opportunity.

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SUSTAINABILITY POTENTIAL AND POLICY FRAMEWORK OF CONSTRUCTED WETLANDS FOR WASTEWATER TREATMENT: AN ONTARIO PERSPECTIVE

By Jack Wallace

MUCH OF THE WORLD'S fresh water is under threat from numerous pressures, including point-source pollution from municipal wastewater. The large, centralized treatment facilities favoured in developed nations are energy intensive and expensive to build and operate. In developing nations, these centralized systems are too costly to build and maintain, frequently leading to the discharge of untreated sewage into water systems (Sundaravadivel and Vigneswaran). Both situations can benefit from sustainable treatment technologies that carry low capital and operating and maintenance (O&M) costs, and require minimal energy input, while treating wastewater to minimize ecological impacts and health risks.

One such technology is the implementation of constructed treatment wetlands (CTWs) in wastewater treatment processes. Wetlands can be described as the Earth's kidneys, owing to the numerous valuable functions they perform for water quality improvement, including purification, flood control and sediment retention (Ramsar). While natural wetlands have been the recipients of municipal wastewater effluents since the early 20th century, engineered CTW systems only became the subject of research in the 1960s, with implementation soon following (Vymazal). They are designed to mimic the functions of natural wetlands within a more controlled environment, and generally have either free water surface (FWS) or subsurface flow configurations (Vymazal).

In Ontario, CTWs implemented for municipal wastewater treatment are, at this time, mostly restricted to providing secondary treatment for small and rural community facilities (Kadlec and Wallace). The following provides a summary of the potential for CTWs to improve the sustainability of municipal wastewater treatment in Ontario, and the existing and needed policy framework for the successful implementation of CTW systems.

SUSTAINABILITY POTENTIAL OF CTW SYSTEMS

1. Economic

CTWs are low capital- and energy-intensive treatment components that can reduce the capital and O&M costs of wastewater treatment (Sundaravadivel and Vigneswaran; Kayombo et al.). CTWs, as secondary or tertiary systems, may be implemented to partially or fully replace conventional treatment systems, such as activated sludge, trickling filters and disinfection units, where appropriate (US EPA; Metcalf and Eddy). Electricity is a significant O&M cost for wastewater treatment, and can account for 50 per cent or more of a conventional facility's O&M cost (Ataei). Of the total electricity consumption in a conventional wastewater treatment plant, secondary or tertiary treatment components, which include activated sludge, secondary clarification, and post-aeration/chlorine mixing, can account for more than 60 per cent (Metcalf and Eddy).

A 2009 study comparing a vertical subsurface flow CTW system to two conventional activated sludge systems noted significantly reduced capital (> 40 per cent) and O&M (> 71 per cent) costs for the CTW system (Zhou et al.). In another study comparing CTW and chemical treatment alternatives for phosphorus reduction in agricultural runoff for a large system in Florida, the CTW alternative was found to be 30 per cent cheaper, after factoring replacement costs for both systems over a 50-year life span (Zhou et al.). The life expectancy of treatment systems is an important consideration, as replacement of equipment will incur additional costs. Life expectancies for conventional concrete and steel treatment alternatives are traditionally in the range of 20 years, while CTW alternatives can last significantly longer, into the range of up to 80 years for FWS systems (Kadlec).

2. Environmental

Environmental benefits offered by CTWs consist of reduced greenhouse gas (GHG) emissions, when compared with conventional processes, and generation of reclaimed habitat for wildlife. Direct GHG emissions from wastewater treatment comprise carbon dioxide, methane and nitrous oxide from biological processes (Monteith et al.). Significant indirect GHG emissions are generated in the construction and operation of the facilities, due to the life cycle emissions for materials and process energy consumption. In a life cycle assessment of a CTW system compared with a conventional activated sludge (CAS) system, it was noted that while direct GHG emissions from the CTW system were higher compared to those from the CAS system, indirect emissions were significantly lower than those from the CAS. Accounting for both direct and indirect emissions, the total GHG emissions from the CTW and CAS systems, on a per m^3 treated basis, were 0.20 and 0.74 kilograms CO_2 equivalent, respectively (Chen et al.).

FWS CTWs can compensate for lost habitat due to urbanization and widespread conversion of wetlands and other natural areas to agricultural fields. It was estimated that by 2002, up to 72 per cent of southern Ontario's pre-settlement inland wetlands had been lost, and continue to be lost at alarming rates, due to these land use changes (Ducks Unlimited). FWS CTWs can replenish lost wetlands habitat and enhance biodiversity, with increasing

wetland area and macrophyte cover positively affecting wildlife (Hsu et al.).

3. Social

The potential social benefits of CTWs lie in the recreational and education opportunities that they present. FWS CTWs offer natural habitat space that could be opened to the public for enjoyment and education, provided appropriate safety controls and notifications are in place. At a time when fresh water is becoming more valuable and increasingly threatened, there is great intrinsic value in educating youth on the importance of wastewater treatment and promising technologies such as CTWs.

EVALUATION OF REGULATIONS AND POLICIES FOR CTW IN ONTARIO

Current relevant policies and regulations

Beyond the regulations controlling wastewater treatment in the *Ontario Water Resources Act* (OWRA), there is no consolidated policy or set of policies for implementing or spurring investment in CTWs in Ontario at this time. While not a policy per se, the Ministry of the Environment (MOE) does provide design guidelines for wastewater/sewage treatment operations (*Design Guidelines for Sewage Works*), including CTWs, and thus recognizes CTWs as a suitable treatment component (Ontario MOE). The document discusses site features and guidelines that should be considered in wetland design. The MOE notes that, due to their somewhat limited process control, CTWs should be used as a tertiary component of the overall process (Ontario MOE).

The provincial policy statement (PPS), released in 2005 by the Ministry of Municipal Affairs and Housing (MMAH), provides guidelines and restrictions on land use and the associated planning process. In relation to wetlands, the PPS states restrictions on development of provincially significant wetlands, defined by their location in specific "eco-regions" (Ontario MMAH).These restrictions would not apply to CTW systems, as they are constructed for a specific purpose and not natural areas that can be lost to development. More applicable to CTWs may be the PPS' text on intensification and development patterns for urban and suburban areas. As previously noted, CTWs are at this time more appropriate for small and rural communities, with their use in larger, denser urban areas potentially leading to conflicts with the PPS' intensification requirements (Ontario MMAH).

Land use policies are complemented by numerous policies on wetland conservation and the value of their benefits, produced by the Ministry of Natural Resources (MNR) and numerous conservation authorities in the province. MNR maintains the Ontario Wetland Evaluation System (OWES), a set of technical guidance documents that are used by planners to evaluate and rank the value of specific wetlands, in conjunction with the PPS, to inform land use planning and wetland protection (Ontario MNR, 2012). Values and functions are grouped into four main categories: biological, social, hydrological and special features (Ontario MNR, 2011). MNR works with numerous conservation and governmental organizations to implement the OWES and other conservation efforts.

Policy changes to support successful implementation

Without a harmonized, comprehensive policy to promote and support the implementation of CTWs in Ontario, their development may not reach the potential described earlier. While several successful installations exist in the province, and regulations are accommodating, there is no unified stance from the provincial government and no consolidated source of information.

A good example of the Ontario government's commitment to a particular cause is in the renewable energy sector, which has seen substantial investment and implementation following enactment of the *Green Energy Act* in 2009. The act developed a considerable incentive structure, namely the Feed-in Tariff Program, to spur development of renewable energy projects and subsidize the research and manufacture of technology components, such as solar photovoltaic cells. For CTWs, encouragement of the technology would likely be through the approvals process instead of financial incentives, mainly because CTWs, in contrast with renewable energy projects, are not money-driven systems for private investors. The proposed policy document would give stakeholders the needed information to evaluate installing a CTW and the associated benefits, and the approvals process would support the installation, directed by the contents of the policy document (NAWCC). Key components of the proposed policy would be a structure for reporting and long-term monitoring of sites, recognition of wetland benefits, guidelines and requirements related to land use policy, and recognition of infrastructure investment needs.

Since CTWs, particularly FWS systems, can share many of the same habitat, biodiversity and social benefits that natural wetlands bring, the proposed policy should incorporate aspects of the natural wetlands policies developed by MNR and conservation authorities. This would occur by adopting many of the documentation and monitoring practices in place for natural wetlands. Specifically, a comprehensive database of local CTW projects across the province and country should be developed and supported by the proposed policy (NAWCC). Monitoring conducted in compliance with the OWRA could be included in such a database to provide an ongoing account of performance and issues. Additionally, the potential of CTWs to compensate for historical wetland loss and provide reclaimed wildlife habitat is a key benefit of the technology that should be embraced, as is being done by the Alberta Water Council in developing that province's wetland policy (NAWCC, Alberta Water Council). Technical issues faced by CTW implementation in Canada, includ-

ing reduced performance in cold climate, hydraulic loading, wildlife benefits and nutrient removal, need to be addressed in the proposed policy to inform stakeholders, and should be included in the database mentioned (NAWCC).

Requirements for land use, in harmony with the PPS, must also be incorporated in the proposed policy. Encouraging implementation of CTW systems beyond the level of small and rural community systems must consider the restrictions that more population-dense, space-constrained urban areas have. If CTWs are to be installed at existing urban facilities, lack of free land space may limit the type and size of CTW system that can be installed. Additionally, annexing surrounding land into a facility's ownership may be feasible, but can detract from other forms of development on these areas, such as for housing, or commercial, industrial and institutional facilities. Local residents may also have concerns about where CTW systems are situated. The policy should emphasize the requirements for public education and consultation, as directed by MOE's environmental approval compliance (ECA) process, and should promote aggressive education to the public on the expected benefits of the system.

Finally, the proposed policy should bolster the opportunity for CTWs to be implemented in new facilities or existing facilities requiring infrastructure upgrades. This is important at a time when significant investment in new wastewater infrastructure may be required. Statistics Canada estimates that wastewater treatment facilities surpassed 63 per cent of their overall useful life nationally and 60 per cent in Ontario, based on an average life of 28.2 years (Statistics Canada).

CONCLUSIONS

In developing and developed countries alike, CTWs offer considerable potential to treat municipal wastewater sustainably. Implementing CTWs for secondary and tertiary treatment can bring measurable sustainability benefits, including reduced capital and O&M costs, GHG reduction, carbon storage, habitat reclamation, and human recreation and education opportunities. In Ontario, there is no consolidated policy from the Ontario government on CTWs to encourage their implementation. As such, CTW development in the province has been limited, with planners, engineers and the public under-informed about their sustainability potential and how they can be properly utilized. A comprehensive policy needs to be developed to encourage the adoption of CTW systems, and should consider such factors and concerns from government, industry and public stakeholders as: performance and cost; land use planning; water resources protection; habitat conservation; and health and environmental concerns.

Pollution of fresh water resources places enormous stress on aquatic ecosystems, and hinders humans' ability to access these resources beneficially. Meanwhile, global population growth and climate change are making fresh water more valuable, spurring the need for suitable wastewater treatment to mitigate pollution. CTW technology can make a significant contribution to the sustainable water treatment systems required around the world for the long term. Σ

Jack Wallace is a master's student in the department of civil engineering at Queen's University under the collaborative master's in applied sustainability program. He won the 2013 OCEPP student essay competition in the graduate student category.

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[IN COUNCIL]

COUNCIL APPROVES PEO'S 2014 BUDGETS

490TH MEETING, NOVEMBER 22, 2013

By Jennifer Coombes

COUNCIL APPROVED PEO's draft 2014 operating and capital budgets at the November meeting, as recommended by the Finance Committee.

The operating budget meets council's reserve policy and shows an excess of revenue over expenses of $328,000.

Total revenues for 2014 are projected to be $24.1 million, which will be an increase of $608,000 (2.6 per cent) over 2013. The projected increases will be mainly due to:

- increased application, registration and other fees, $341,000 (6.2 per cent);
- increased P.Eng. dues because of a membership increase, $303,000 (2.1 per cent); and
- a small increase in headquarters revenues due to new tenants.

To offset these increases, a decrease in advertising revenue of $100,000 (22 per cent) is projected.

The expenses planned for 2014 are $23.8 million, which is $816,000 (3.6 per cent) above the 2013 budget figure.

The projected increases will be mainly due to:

- increased employee salaries and benefits and retiree future benefits, $638,000 (5.9 per cent), due to a 3.4 per cent increase in staff salaries for merit increases and CPI adjustments and five new staff positions;
- an increase of $296,000 in computer and telephone costs;
- an increase of $148,000 for chapters (greater allocations by council);
- an increase of $77,000 in amortization due to 2013's and past years' capital expenditures taking full effect, and to 2014 capital expenditures;
- an increase of $73,000 for postage for council election mailings; and
- an increase of $67,000 for contract staff to handle the increased P.Eng. applications already received due to the pending repeal of the industrial exception.

The increased expenses are expected to be offset by:

- a reduction of $240,000 in PEO occupancy costs;
- a reduction of $84,000 in advertising costs; and
- lower costs for purchased services, including printing *Engineering Dimensions*, and catering.

Council also approved the 2014 draft capital budget of $2.8 million, which comprises headquarters leasehold improvements for tenants in the PEO building ($279,000), capital improvements to the building itself ($1.8 million), and IT and facilities costs ($766,500), which include the replacement of PEO's current licence holder management system.

NEW SOFTWARE DEVELOPMENT GUIDELINE

At the November meeting, council approved the *Guideline for Professional Engineers Developing Software for Safety Critical Engineering Applications*. The guideline replaces the outdated *The Use of Computer Software Tools by Professional Engineers and the Development of Computer Software Affecting Public Safety and Welfare* guideline.

The new guideline, written by a subcommittee of the Professional Standards Committee comprising engineers who have software development experience in their own practices, delves into the legal, ethical and technical aspects of software design and development, where it falls within the scope of professional engineering, that could have an impact on the public interest.

The new guideline outlines the ethical and professional responsibilities of engineers to ensure the public interest is protected and provides guidance for others interfacing with engineers who are developing software, such as clients and owners who are acquiring ready-made software or specifying requirements for new software. It is available from the PEO website at: www.peo.on.ca/index.php/ci_id/1834/la_id/1.htm.

CFL ENFORCEMENT ELEMENT

Council approved a motion indicating PEO's concurrence with an element of the Canadian Framework for Licensure (CFL) concerning enforcement practices. The CFL is an Engineers Canada project intended to harmonize regulatory practices across Canada among engineering regulators (see feature, page 28). The components of the practices are referred to as elements.

EMERGING DISCIPLINES REPORTS

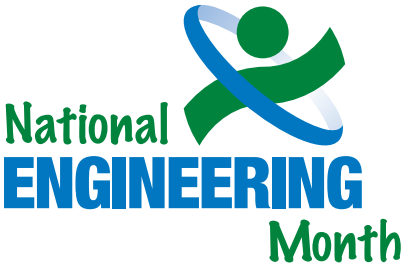
Council received two reports from the Emerging Discipline Task Force at the November meeting–the executive summary of the task force's Communications Infrastructure Engineering (CIE) Phase 2 report and its Nanotechnology/Molecular Engineering (NME) Phase 2 report.

The CIE Phase 2 report contains 22 recommendations and the NME Phase 2 report 17, concerning admissions, rights to practise, and other areas that define an engineering discipline.

Council directed that recommendations contained in the CIE report be presented to Engineers Canada, the Licensing Process Task Force and the Academic Requirements, Experience Requirements, Legislation, Professional Standards and Enforcement committees for comment.

The reports are intended to prepare PEO to take licence applications for P.Eng. and limited licences from engineering graduates with CIE and NME backgrounds and to regulate their practice.

No act, regulation or bylaw changes are needed to begin regulating these new fields of practice. Σ



2014 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 involving Engineers Without Borders Canada (EWB), Professional Engineers Ontario (PEO) and the Ontario Association of Certified Engineering Technicians and Technologists (OACETT), over 145 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 the website nemontario.ca, like our Facebook page at www.facebook.com/nemontario and follow us on Twitter @nemontario.

BRAMPTON

7TH ANNUAL BRIDGE-BUILDING CHALLENGE **March 22** PEO's Brampton Chapter hosts a bridge-building challenge for kids in grades 5 to 8. The challenge is open to Halton-Peel Region public and separate schools. Contact Max Morrow, P.Eng., at 905-452-1529.

CHATHAM

LOCAL AND PROVINCE-WIDE STUDENT ENGINEERING CHALLENGE **March 2, John McGregor Secondary School** PEO's Chatham-Kent Chapter hosts two concurrent impromptu design competitions for Lambton-Kent area schools. The junior division is for grades 7 and 8 students and the senior division is 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 jrincon@uniongas.com or 519-436-4600, ext. 5002185.

GUELPH

LOCAL MALL DISPLAY **Stone Road Mall** For three weekends in March, PEO's Grand River Chapter will set up booths in local malls to promote NEM Ontario to the general public. Contact Ankit Agrawal, EIT, at agraanki@gmail.com or 226-979-2745.

MATHLETICS 2014 PEO's Grand River Chapter will introduce engineering principles to elementary school students through a fun and interactive math contest.

HAMILTON

ENGINEERING PANEL DISCUSSION **March 20, McMaster University** A panel comprising professional engineers and the McMaster Engineering Student Society hosts an engineering panel discussion to discuss engineering careers. This event, aimed at high school students, is concluded by a tour of the McMaster nuclear reactor. Contact the Education Committee at peohb.education@gmail.com.

KINGSTON

14TH ANNUAL POPSICLE STICK BRIDGE CONTEST **March 1, Queen's University** Elementary school students build popsicle stick bridges to be load tested by PEO's Kingston Chapter volunteers. Contact Brenden MacKinnon, P.Eng., at bda_mackinnon@sympatico.ca or 613-328-0647.

KITCHENER

K'NEX BRIDGE-BUILDING CONTEST **The Museum, Kitchener** In conjunction with The Museum, University of Waterloo and Conestoga College, PEO's Grand River Chapter hosts a K'NEX bridge-building contest for elementary school students. Contact Kaoru Yajima, P.Eng., or Terry Gomez, P.Eng., at ykaoru@region.waterloo.on.ca or 519-575-4757, ext. 3349.

LONDON

FORKED RIVER BREWERY TOUR **March 14, Forked River Brewery** PEO's London Chapter invites university students, young and established professionals, and members of the general public to a brewery tour at the Forked River Brewery in London. Contact Scott Keys at scotkeys@gmail.com for more information.

TOUR OF THE WINDEEE DOME AT WESTERN UNIVERSITY **March 20** PEO's London Chapter invites young and established professionals to a tour of the WindEEE Dome at Western University. The WindEEE Institute researches wind engineering and natural disaster mitigation as well as environmental sustainability and green

engineering. Contact George Biljan, P.Eng., at gjbiljan@gmail.com or 519-281-4388, or contact Andrew Mathers, P.Eng., at windeee@uwo.ca or 519-661-2111, ext. 89143.

ENGINEERING ACTIVITIES AT THE LONDON CHILDREN'S MUSEUM **March 22, London Children's Museum** PEO's London Chapter invites elementary school students to the London Children's Museum for engineering activities incorporating Rubik's cubes and paper airplanes. Contact Murray MacDonald, P.Eng., at murray@mmconsulting.ca or 519-859-8723.

EIT INFORMATION NIGHT **March 25, Western University** This event is an informative night for Western students and London graduates who are thinking about applying to be EITs or who already are EITs. The session will go through the application process and answer any questions students or graduates may have. Contact Alex Hockin or Shahram Amirnia at wro@peo.on.ca or 519-661-3764.

LABATT BREWERY TOUR **March 27, Labatt Brewery** PEO's London Chapter invites university students, young and established professionals, and members of the public to a brewery tour at the Labatt Brewery in London. Contact Syd Van Geelm, P.Eng., at syd.vangeel@rogers.com for more information.

UTRACA LEED BUILDING TOUR PEO's London Chapter invites university students, young and established professionals, and members of the general public to a tour of the UTRACA LEED building and the Fanshawe Dam. Contact Imtiaz Shah, P.Eng., at 519-451-2800 for more information.

WOMEN IN ENGINEERING **March 29, Ramada Inn** The event will be organized to support current female engineers and engineering students, promote their retention in the engineering profession, support them to follow their academic interests and help prepare female engineers for a diverse workforce. Contact Adriana Csiba, P.Eng., at acsiba@sympatico.ca or 519-641-1843 for more details.

MISSISSAUGA

BRIDGE-BUILDING COMPETITION **March 1, Tomken Road Middle School** Elementary school students are invited to build popsicle stick bridges, which will be strength tested by a bridge-buster machine. The bridges are marked by a panel of judges on aesthetics, design and strength. Contact Fawad Mehmud, EIT, at fawad.mehmud@peo-mc.ca or 647-784-9933.

NEWMARKET

VEHICLE OCCUPANT SAFETY DESIGN CHALLENGE **March 6, Newmarket High School** In this exciting design challenge, students from grades 6 to 8 will be introduced to vehicle safety systems and crumple zone. Past design challenges have focused on airships (2011), wind turbines (2012) and water wheels (2013). Contact Paymon Sani, P.Eng., at education@peoyork.com or 416-804-6909.

NIAGARA FALLS

NIAGARA ENGINEERING WEEK LUNCHEON **February 28, Club Italia** Niagara Engineering Week is back to present a luncheon and workshop that brings together the Niagara engineering community, from industry leaders and colleagues to engineering and technology students.

NORTH BAY

2014 BRIDGE-BUILDING COMPETITION **March 20, North Bay and March 24, Sturgeon Falls** PEO's North Bay Chapter presents a balsa wood bridge-building competition for students of all ages. Contact Luc Roberge, P.Eng., at luc.roberge@opg.com or 705-498-2428, or James Dunlop, P.Eng., at james.dunlop@opg.com.

OAKVILLE

ENGINEERING FOR A DIVERSE WORLD **March 1, Holy Trinity Catholic High School** PEO's Oakville Chapter hosts a day-long event at a local high school. The day comprises three activities: speed engineering, lunch mini activities, and a design challenge. During speed engineering, students are given a "passport" that will be stamped by 20 volunteers at different stations to learn about various engineering disciplines. Lunch mini activities will highlight different aspects of the engineering design process in a fun and interactive way. The design challenge gives teams of students 45 minutes to design and construct a building that can withstand diverse weather extremes. Contact Shannon Pole, EIT, at education@peo-oakvillechapter.ca or 289-440-1886.

OSHAWA

9TH ANNUAL DURHAM POPSICLE STICK BRIDGE-BUILDING CONTEST **March 29, University of Ontario Institute of Technology** PEO's Lake Ontario and OACETT's Durham chapters invite elementary school students in grades 4 to 8 in Durham to participate in their contest. Before the event, students build bridges using no more than 200 popsicle sticks to span 500mm. Teams bring their bridges to the event where they will be tested to determine the strongest bridge. Contact Derek Van Ee, P.Eng., at dvanee@gmail.com or 416-659-2222.

OTTAWA

NRC'S ENGINEERING CHALLENGE 2014 Throughout February in various elementary schools and with finals on February 27, PEO's Ottawa Chapter and National Research Council Canada pair up to bring an engineering design challenge to students in grades 5 to 7. Students are asked to design, build and test a mechanically powered launcher. Contact David Dudzinski, P.Eng., at david.dudzinski@nrc.ca or 613-998-6473.

CANADA AVIATION AND SPACE MUSEUM KAPLA EVENT **March 2, Canada Aviation and Space Museum** Elementary school students work in teams or as single competitors to build and race various aviation or space-based vehicles and objects. Students will be judged on form, function and accuracy. Contact Pierre Legault, P.Eng., at pierre.legault2@forces.gc.ca or 613-995-3038.

CARLETON UNIVERSITY ENGINEERING LUNCH-AND-LEARN EVENT **March 6, Carleton University** Senior experienced engineers will share their engineering stories and future plans to inspire engineering students to make a difference in their communities and around the world. Students are also encouraged to share their ideas and life plans. Contact Pierre Legault, P.Eng., at pierre.legault2@forces.gc.ca or 613-995-3038.

UNIVERSITY OF OTTAWA ENGINEERING LUNCH-AND-LEARN EVENT **March 6, University of Ottawa, Colonel By Building** Senior experienced engineers will share their engineering stories and future plans to inspire engineering students to make a difference in their communities and around the world. Students are also encouraged to share their ideas and life plans. Contact Pierre Legault, P.Eng., at pierre.legault2@forces.gc.ca or 613-995-3038.

CANADA SCIENCE AND TECHNOLOGY MUSEUM K'NEX EVENT **March 8, Canada Science and Technology Museum** Working in teams or as single competitors, elementary school participants are challenged to build various examples of real-life vehicles and objects. Students will be judged on form, function and accuracy. Contact Pierre Legault, P.Eng., at pierre.legault2@forces.gc.ca or at 613-995-3038.

PETERBOROUGH

2014 NATIONAL ENGINEERING MONTH DESIGN CHALLENGE **March 4, Evinrude Centre** Peterborough's PEO and OACETT chapters and the Institute of Electrical and Electronic Engineers (IEEE) invite high school students to participate in the design and construction of a popsicle stick bridge. This is the first time in over 10 years that the Peterborough Chapter has held a bridge-building contest for their annual design challenge. Contact Dan Manns, P.Eng., at daniel.manns@ge.com or 705-748-7290.

SARNIA

CANSTRUCTION **February 28 to March 18, Lambton Mall** Teams of engineers, architects, students, professionals and their families design and build giant structures out of canned food products for donation to the local food bank. Some designs include advanced engineering features like motion sensing and PLC programming. Contact Michelle Croal at michelle.croal@shell.com or 519-481-1556.

ENGINEERING DISCOVERY DAY **March 22, Lambton Mall** PEO's Lambton Chapter will create mall booths geared towards hands-on participation. The public is invited to participate in challenges where simple objects are used to demonstrate scientific principles. Participants are given discovery day passports for a fun, hands-on learning experience. Contact Katie Lam, P.Eng., at 2kaytee@gmail.com or 519-339-2828.

IMPROMPTU DESIGN CHALLENGE **March 29, Lambton College** High school students are invited to compete in teams of two to four people to build an object/structure that challenges their knowledge and problem-solving skills. Until they arrive at the event they will not know what they are building and they must use the materials provided to build their structure within a defined time. Contact Donna Poon, EIT, at sarniaengweek@gmail.com or 519-862-2911.

SAULT STE. MARIE

SAULT STE. MARIE ENGINEERING MONTH EVENT **March 22 to 29, Sault Ste. Marie Station Mall** PEO's Algoma and OACETT's Sault Ste. Marie chapters host a series of engineering outreach activities in various local schools through the week leading up to the March 28 mall event. On Saturday (March 29) they host an annual engineering day at the mall. This includes engineering displays from local businesses, a team math challenge, colouring contests, robotics displays and other exciting interactive displays. Contact Michael Paciocco, EIT, at michaelpaciocco@alumni.uwaterloo.ca or 705-949-1033, ext. 205.

SCARBOROUGH

POPSICLE STICK BRIDGE-BUILDING COMPETITION **March 8, Scarborough Civic Centre** PEO Scarborough Chapter's popsicle stick bridge-building competition is a competition for grades 3 to 8 students from Scarborough elementary schools. A bridge destruction machine is used to test the maximum load-bearing capacity of the students' creations. Multimedia projectors will be used to show live load testing, real-time display of team performance and rankings. Contact Narayanapillai Asogan, P.Eng., at nasogan@hotmail.com or 416-500-5048.

SIMCOE

SIMCOE COUNTY BRIDGE AND CATAPULT CONTEST **March 1, Nantyr Shores Secondary School** PEO's Simcoe-Muskoka and OACETT's Georgian Bay chapters invite students in grades 5 to 8 to a day of interactive, hands-on engineering workshops. Students participate in a popsicle stick bridge-building contest. The team whose bridge can withstand the highest load will be declared the winner. The second competition is a catapult design contest. Contestants build a catapult using popsicle sticks, glue and rubber bands. Catapults will be required to fire six projectiles toward a target from two different locations. In addition to contests, there will also be various science demonstrations, such as a wind turbine, Raspberry-Pi computer, Arduino board, and more. Contact Robert Vos, P.Eng., at robert.vos@genival-inc.com or 705-220-7662.

SUDBURY

BRIDGE BUILDING **March 6, Dynamic Earth Atlas Copco Theatre** PEO's and OACETT's Sudbury chapters invite students of all ages to their 18th annual balsa wood bridge-building extravaganza. Contact Jeff Shaw, EIT, at jeffkshaw@gmail.com or 416-554-7336 for more details.

THOUSAND ISLANDS

6TH ANNUAL BRIDGE-BUILDING COMPETITION **March 1 to March 31, various locations** PEO's Thousand Islands Chapter hosts their 6th annual bridge-building competition. Responsibility, perseverance, honesty and resiliency are values practised by teams of up to four students, who will design, construct and test their bridges. Students from various elementary schools within the Upper Canada District School Board will be given four weeks to design and construct their bridges. The contest culminates in a regional competition. Contact John Ireland, P.Eng., at john@ireland.ca or 613-283-1788.

THUNDER BAY

TEAM DESIGN COMPETITIONS AND ENGINEERING PROJECTS SHOWCASE **March 21, Lakehead University** PEO's Lakehead Chapter teams up with Lakehead University to host an all-day event for students in grades 5 to 8 from Thunder Bay and surrounding regions. In the morning, students take part in a team design competition. In the afternoon, engineering students from Lakehead University showcase their design projects. The day is concluded with talks about current engineering projects from Lakehead Chapter EIT and P.Eng. volunteers. Contact Meilan Liu, PhD, P.Eng., at mliu@lakehead.ca or 807-343-8952.

TORONTO

7TH ANNUAL ENGINEERING IDOL COMPETITION **March 1, Ryerson University** PEO's Etobicoke Chapter hosts their 7th annual Engineering Idol competition, where teams from 10 selected high schools participate in an engineering design challenge to create an efficient bioreactor that produces algae. Students brainstorm creative ways of harnessing fuel from green energy sources. Visit www.engineeringidol.com or contact Andrew Demeter, EIT, at ar.demeter@gmail.com or 416-505-8433.

ENGINEERING INNOVATIONS FORUM 2014 **March 6, Ontario Science Centre** This year, the Engineering Innovations Forum will present engineering innovations in 3-D imaging. This includes 3-D scanning and printing. Topics range from 3-D technology in gaming to forensic investigations and medical applications. Contact Paul Annis at pannis789@gmail.com or 416-230-0967.

NOTHIN' BUT NEM **March 7, Kick-off party at Real Sports Bar & Grill and Raptors game at Air Canada Centre, Toronto** The National Engineering Month Ontario Steering Committee is thrilled to invite you to kick off National Engineering Month. Organized by OSPE, this event is a wonderful opportunity for the engineering community to enjoy a night of networking and exciting Raptors basketball! Professionals, students and families are invited to connect in an energy-charged setting. Enjoy food and networking at Real Sports Bar and Grill from 4:30 p.m. to 7 p.m., followed by an exciting Toronto Raptors basketball game at Air Canada Centre.

Contact Liz Greenland at lgreenland@ospe.on.ca

SOLUTIONS FACTORY TORONTO–ENGINEERING INNOVATIONS WITHIN INDUSTRIES PEO's Toronto Humber Chapter invites high school and university students, as well as young and established professionals, to the Solutions Factory in Toronto. Participants are engaged through seminars and guided tours to see real-life industrial applications of engineering. There will be demonstrations of mining, pulp and paper, and food and beverage applications. Additionally, participants will meet with the application engineering staff. Contact Shiva Bissoon, P.Eng., for more details.

WATERLOO

EXHIBITION AT FIRST ROBOTICS REGIONAL FINALS COMPETITION **March 22, University of Waterloo** PEO's Grand River Chapter is providing assistance to the regional high school robotics challenge. Contact Kaoru Yajima, P.Eng., at ykaoru@region.waterloo.on.ca or 519-575-4757, ext. 3349.

PRE-SHAD VALLEY EXHIBIT This half-day event brings grades 7 and 8 students from Kitchener, Waterloo and Cambridge together to learn about local engineering organizations and talk about the engineering profession. PEO's Grand River Chapter will set up a booth with chapter volunteers to talk to students about the profession. Contact Kaoru Yajima, P.Eng., at ykaoru@region.waterloo.on.ca or 519-575-4757, ext. 3349.

WILLOWDALE

BUILDING ENGINEERING WORLD IN 2020 **March 24 to 28** PEO's Willowdale-Thornhill Chapter has created a video contest for high school students in the Willowdale/Thornhill area. The contest, titled Exploring Engineering in the Year 2020, asks students to conceptualize life in the future and identify the role of engineers in the year 2020. Contact John Penaranda, P.Eng., at penaranda.john@gmail.com or education@wtpeo.org for more information.

INSIDE THE ELECTRICITY DISCOVERY CENTRE The Electricity Discovery Centre (EDC) is a 1000-square-foot event trailer that contains interactive displays designed to engage and educate consumers about electrical safety, distribution modernization and electricity costs. The EDC will travel across Hydro One's service territory and attend community festivals, retail locations and schools and will be the focal point for Hydro One's consumer education and engagement activities. Contact John Penaranda, P.Eng., at penaranda.john@gmail.com for more information.

WINDSOR

A WIRELESS WORLD: HOW WE'VE RE-ENGINEERED THE WAY WE COMMUNICATE **March 6, Canada South Science City** PEO's Windsor-Essex and OACETT's Essex chapters pair up to bring an informative event about communication technology to the public. This event will describe how the latest communication technologies have been developed and their evolution over time. More importantly, it will speak of the engineering know-how that has gone into wireless development and how engineers are continuing to deliver new and fascinating opportunities in this area. Contact Andrew Dowie, P.Eng., for more information.

CAREERS & CLASSIFIED

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DEADLINE FOR JULY/AUGUST 2014 IS JUNE 3, 2014.

AN IRON RING MYTH

Re: "Putting some engineering myths to rest," *Engineering Dimensions*, September/October 2013, p. 34, Mr. Mastromatteo's article needs correction with regard to "Myth: An iron ring makes you an engineer."

Contrary to the article's assertion, the iron ring does not mean the wearer is a graduate of a Canadian engineering program. I am personally aware of a number of immigrants and Canadians that did not graduate from a Canadian university, who applied to the Camp Warden to be able to take part in the Ritual of the Calling of an Engineer (written by Rudyard Kipling). These people had achieved certification as professional engineers by accreditation of educational and professional experience and/or the passing of required exams, not by graduating from a Canadian university.

My point is that the iron ring, worn on the small finger of the working hand, has a copyright and signifies the person wearing it has taken part in the ritual and taken the oath. Invitation to take part in the ritual is extended to all Canadian university engineering students about to graduate. Anyone in the practice of engineering in Canada not invited through their university "camp" can gain the right to wear the iron ring by applying to the camp to be admitted to the ritual ceremony and taking the oath.

Elio Comello, P.Eng., Camlachie, ON

COOL IT ON CLIMATE CHANGE

I am getting tired of hearing from climate change evangelists that anyone who does not agree with them is a heretic. I use the term "evangelist" because, although they claim global warming is science and not a religion, they defeat their own argument with the use of the religious term "heretic."

Science is not a democracy. There was a time when the vast majority of scientists thought the world was flat. Fortunately, we did not take a vote. When approximately 20 per cent of scientists today are not sure that humans even cause so-called climate change, let alone believe whether today's climate is even significantly different from other times in history, it is absurd to argue the "debate is over."

Seeing as proponents of human-caused climate change like to cite facts, let us get a few straight:

- Earth's average temperature has been steady for the past 15 years. Proponents talk about taking a break but scientific principles are at play all the time. Newton never found a break when gravity did not cause apples to fall;
- In the middle of the last century, we saw a period of temperature records that mirror what we are seeing today;
- CO_2 is needed for life and is not a pollutant;
- Many of the same proponents of climate change today were the same people who were worried about global cooling in the 1970s;
- Although there may be some disagreement on whether the ice at the North Pole is diminishing, there is no argument that ice levels are not changing at the South Pole;
- The polar ice caps on Mars are getting smaller and there are no humans up there;
- Deep water buoys have not shown any increase in ocean temperatures for the 50 years they have been measuring it; and
- There has never been a scientific link between severe weather and CO_2 levels.

When mathematical models do not coincide with actual data, you cannot ignore the data; rather, you must revisit the model. Interestingly enough, it was Arnold Schwarzenegger, when governor of California, who said he was not a scientist and did not know which side was right. He did not want to wait to find out in case it was too late, but did not want to waste money solving a problem that might not exist. His solution was to allocate resources that would have a beneficial effect regardless of which side was right. For example, he supported emission controls on motor vehicles. He reasoned if automobile exhausts were causing climate change, reducing emissions would be good. On the other hand, if they were not, the money would still be well spent as reduced emissions would produce cleaner air to breathe.

Engineers, as scientists, should certainly take part in the debate, but to say the debate is over is irresponsible and certainly not scientific. Maybe Arnold Schwarzenegger's approach is the right one when addressing allocation of society's resources.

Rick Ross, P.Eng., Toronto, ON

[LETTERS]

AN ECONOMICAL PROBLEM

This refers to the article "Climate change, sustainable infrastructure and the challenges facing engineers" by Kean Birch, PhD, and Dalton Wudrich.

Several points raised therein should be considered by engineers and would, if incorporated into designs and construction, reduce the rate at which carbon dioxide and other pollutants enter the atmosphere. As a profession, we could issue specific guidelines, such as: all new projects should be rated by how much they increase the production of fish, ducks and other wildlife. There are many engineering-specific actions that a dedicated profession can and will incorporate into its future actions since we are, at heart, a conservative oriented group and always try to obtain the most reward for the least amount of energy expenditure.

A big obstacle to thinking about pollution reduction is the way the world economy is structured. There is no monetary reward for saving wetlands, forests, fish, glaciers and other natural treasures. There is a large reward for destroying agricultural land, seacoasts, lakes and rivers, coastal lands and numerous other items that could help with reducing the amount of harmful items in our air, water and land. The engineering profession needs help from an economist and a few courageous politicians and country leaders, otherwise engineers alone are not going to solve the problem.

E.R. Trask, P.Eng., Cornwall, ON

IN NEED OF STUDY

Re: September/October 2013 issue, two of the three letters published [on climate change] appear to be from engineers working in the field and could therefore be biased. Remember Y2K and the scare tactics used then? My company, as did many others, spent millions on this and we all know what a hoax that was! Did any engineers come out (in the months before) and say so?

One of the letters was using ethics as a reason for engineers to avoid certain types of work. I honestly do find that extreme. These letters and the now-infamous emails a couple of years back lead me to believe this topic deserves a lot of study before jumping to conclusions and adversely affecting our economy and livelihood.

Ken Dias, P.Eng., MBA, Scarborough, ON

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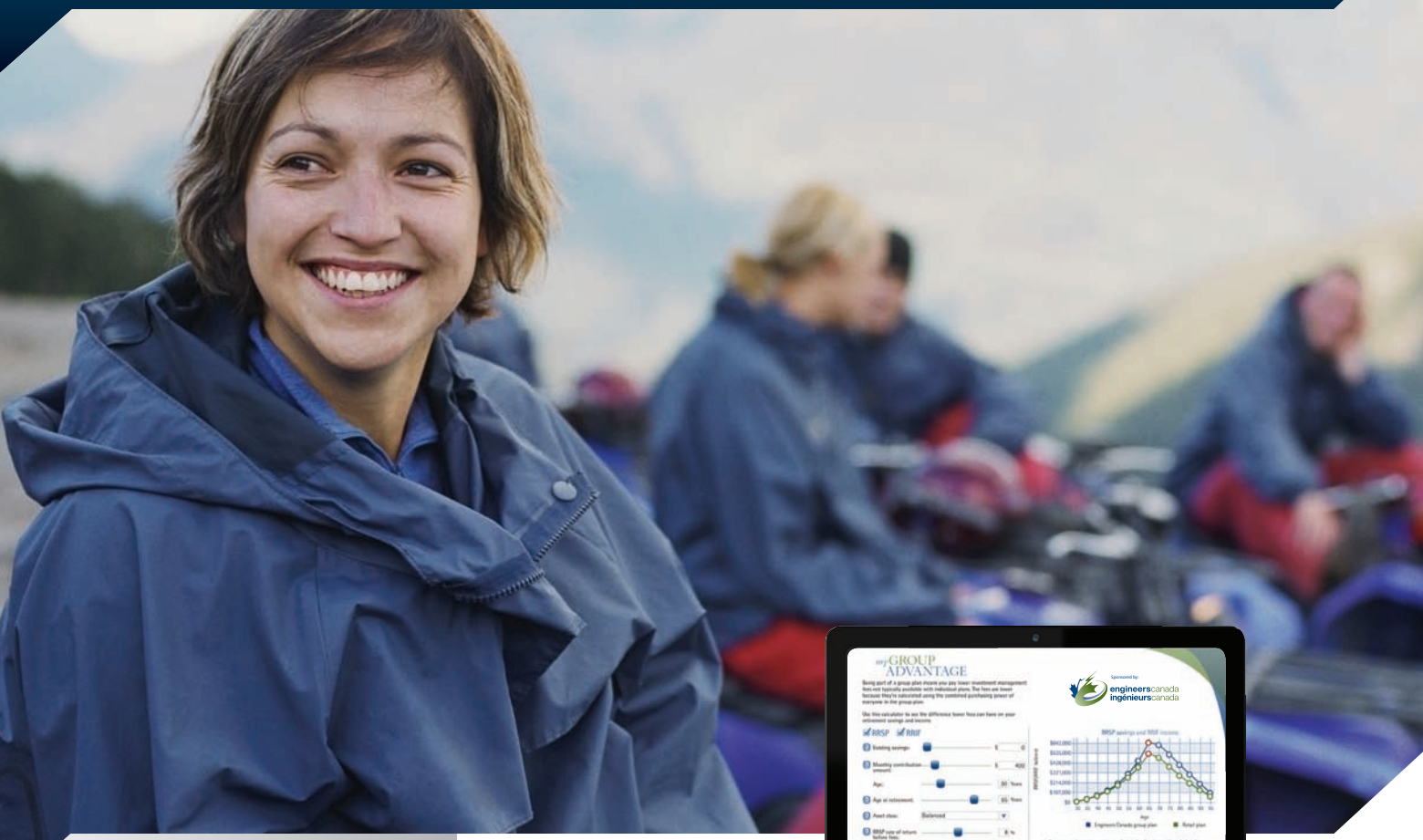

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