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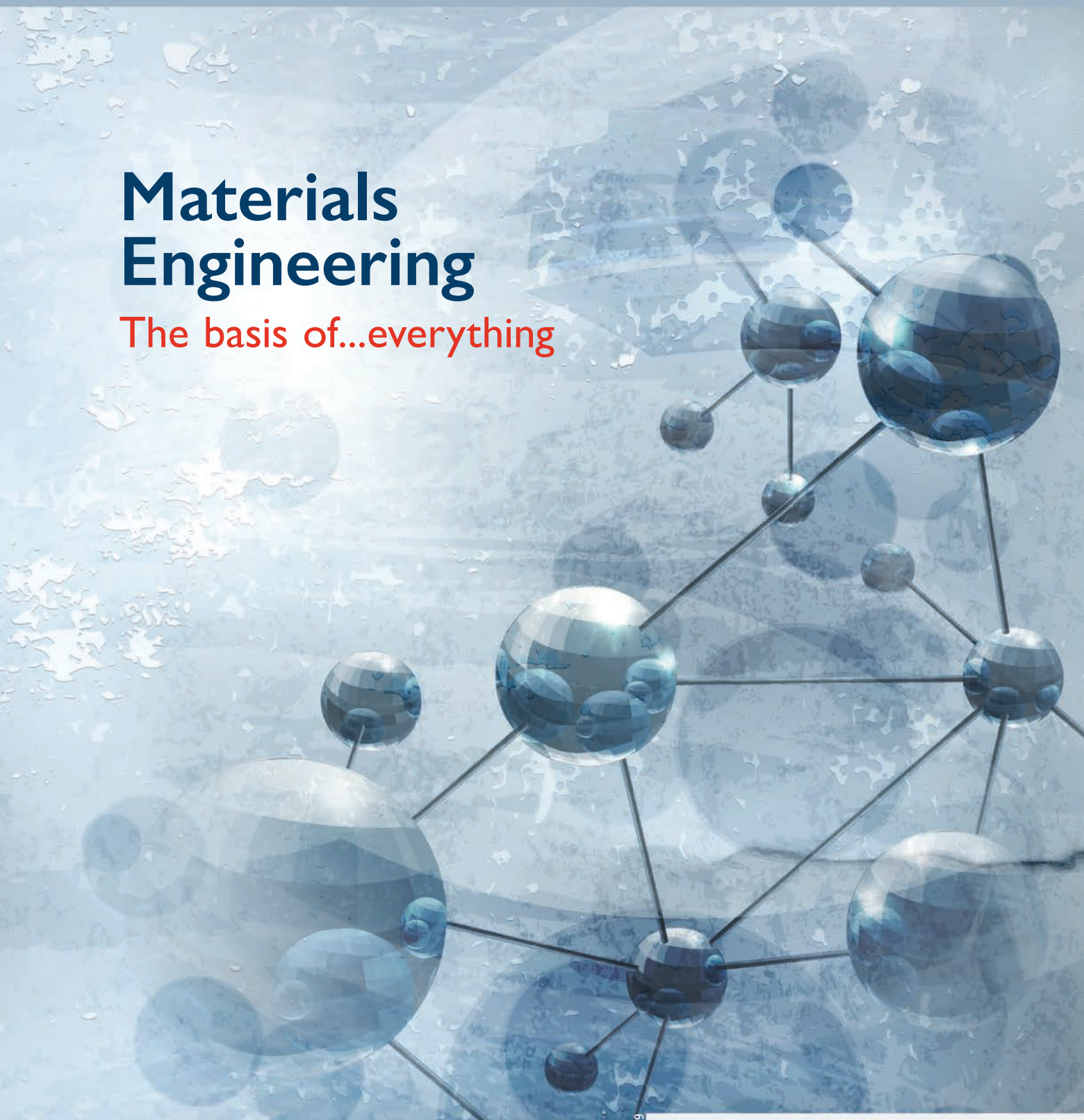

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BUILDING PEO's FUTURE THROUGH INNOVATION, RECOGNITION, COLLABORATION

Thomas Chong, MSc, P.Eng., FEC, PMP
President

AT THE BEGINNING of my term as president, I set three priorities–innovation, recognition and collaboration–that I believe are essential to building a PEO that meets the needs of both its licence holders and the public. I am pleased to report progress in each of these areas.

INNOVATION

Innovation is based on taking good ideas and developing them into something new and valued. And PEO's Ottawa Chapter is doing just that with its Innovative Entrepreneur Leadership Program. On September 30, I was privileged to attend the program's official launch event. Also in attendance was Councillor Marianne Wilkinson (Ward 4, Kanata North, Ottawa) who praised it as a "lead to win" entrepreneurship program.

The program is a true collaboration of PEO, the Ontario Society of Professional Engineers (OSPE), learned societies, universities, government and industry. And I believe this program, rolled out across the province, could play a real part in helping to shift our economy into high gear again, restoring growth, boosting employment, helping small business thrive, restoring manufacturing competitiveness, bringing back Ontario's leadership in high technology, and shifting the country away from resource dependency.

I will watch the program's development with interest, and I look forward to seeing it emulated in other chapters.

RECOGNITION

PEO believes in the value of recognition. The Ontario Professional Engineers Awards (OPEAs), which have honoured professional engineering excellence and community service since 1947, are now a joint program with OSPE. The honourees for 2015 were profiled in the September/October issue of *Engineering Dimensions* and you'll find coverage of the awards gala in the January/February 2016 issue. Please don't forget that the nomination deadline for the 2016 awards is Wednesday, February 24, 2016. Eligibility requirements and nomination forms are available at www.peo.on.ca/index.php/ci_id/2089.htm.

The Professional Engineers Awards Committee, which solicits awards nominations and selects recipients for council approval, has been working on an exciting proposal to elevate the prestige and public recognition of this program–the premier engineering awards in Ontario–even higher. I hope to be able to share the results of these efforts with you soon.

PEO recognizes service to the engineering profession through the Professional Engineers Ontario Order of Honour. Honourees will be inducted this spring.

One of the pleasant duties that goes along with being PEO president is the opportunity to recommend for recognition each year a non-engineer who has shown continuous support of, and made significant contributions to advancing, the engineering profession. Look for an announcement of my 2016 President's Award recipient in January.

COLLABORATION

My third priority enables both of the others. As the Ottawa Chapter program is demonstrating, innovation requires both good ideas and collaboration with others to make them even better. So, too, does work worthy of recognition through one of PEO's awards programs.

Collaboration is also key to the six regional town hall meetings I am hosting across the province this fall, starting in Ottawa, then going to Sault Ste. Marie, North Bay, London, Toronto West and Toronto East. The meetings are aimed at consulting with members on how PEO might best strengthen the engineering profession by implementing recommendations from the Elliot Lake Commission of Inquiry in ways that make sense for both practitioners and the public. Early on in planning for the meetings, we adopted the tag lines "You talk. We listen." and "Help Build PEO's Future," and designed the agenda with more time for questions and comments than for presentations. Your voice matters, so please share your thoughts with us.

All the presentations given at the meetings, and audio from each session, are available on the town hall page on PEO's website at www.peo.on.ca/index.php/ci_id/29011/la_id/1.htm. If, after reviewing the presentations, you have questions and comments, please send them to the email addresses at the end of each presentation.

Because engineering is a self-regulating profession in Canada, each member of the profession has a part to play in regulating it. I can assure you that council will continue to consult with you on major regulation changes affecting our profession and seek your ratification of specific proposals.

ADDING VALUE

For some time now, I have believed the biggest issues facing PEO are:

- increasing the relevance and value of the P.Eng. licence to society and licence holders; and
- providing value for our licence holders' hard-earned licence fees.

To raise the relevance and value of our profession, we must start with a fundamental belief in ourselves, and in our ability to effect change. Through innovation, recognition and collaboration, I believe that, together, we can build PEO's future. Σ

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ENGINEERING DIMENSIONS

PUBLICATIONS STAFF

Publisher
Connie Mucklestone
416-840-1061
cmucklestone@peo.on.ca

Editor
Jennifer Coombes
416-840-1062
jcoombes@peo.on.ca

Associate editor
Michael Mastromatteo
416-840-1098
mmastromatteo@peo.on.ca

Associate editor
Nicole Axworthy
416-840-1093
naxworthy@peo.on.ca

Senior graphic designer
Stephanie Katchmar
416-840-1063
skatchmar@peo.on.ca

Graphic designer
Cindy Reichle
416-840-1067
creichle@peo.on.ca

ADVERTISING SALES

Sales manager
Beth Kukkonen
bkukkonen@dvtail.com

Dovetail Communications
30 East Beaver Creek Road
Suite 202
Richmond Hill, ON
L4B 1J2
Tel: 905-886-6640
Fax: 905-886-6615

Professional Engineers Ontario

THIS ISSUE: This issue we look at materials engineering and its influence on all areas of engineering practice. Often clouded by its overlap with metallurgy, chemical engineering and even nanotechnology, materials may be the least understood area in the entire engineering profession. Materials practitioners, a few of whom are profiled in this issue, hope to clear up some of that misunderstanding.

ENFORCEMENT HOTLINE

Please report any person or company you suspect is practising engineering illegally or illegally using engineering titles. Call the PEO enforcement hotline at 416-224-9528, ext. 1444 or 800-339-3716, ext. 1444. Or email enforcement@peo.on.ca.

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.

[EDITOR'S NOTE]

BACK TO THE BASICS

Jennifer Coombes
Editor

EVER SINCE STONE TOOLS gave way to bronze over 4000 years ago, materials have been at the heart of advancing our civilization. Fast forward to 2015 and nothing has changed. Materials engineering–the discovery and design of new materials, and the improvement of existing ones–makes possible virtually all new technologies in our modern world and, in particular, the world of engineering. Advances in polymers, ceramics, metal alloys, nano-materials and more, are the building blocks of every engineering discipline.

As Carolyn Hansson, PhD, P.Eng., professor of mechanical and mechatronics engineering at the University of Waterloo, says: "Other engineering areas, particularly civil, electrical, aeronautical and mechanical, all draw on materials because you can't make anything without making it *out* of something."

Even though materials form the core of all other types of engineering, what materials engineers do tends to be less understood among the public–and even within the profession itself–than other disciplines. But with their tremendous potential to impact the future of technology, it's only fitting that materials engineers finally get their place in the sun. In "Heart of the matter: Materials poised for new prominence in wider profession" (p. 28), we discuss the far-reaching nature of materials engineering, explain what materials engineers do, and provide some examples of boundary-pushing materials projects happening right here in Ontario.

This fall has been a whirlwind for President Thomas Chong, P.Eng., FEC, Registrar Gerard McDonald, P.Eng., and former president Annette Bergeron, P.Eng., FEC, as they've criss-crossed the province presenting town halls in every region to discuss PEO's key regulatory initiatives with members (p. 8). At the town halls, they've discussed the implementation of recommendations of the Elliot Lake Commission of Inquiry, including continuing professional development (CPD) and a PEO specialist designation.

They've gathered a great deal of valuable feedback from members, which will be used to refine the plan the Continuing Professional Development, Competence and Quality Assurance Task Force is developing and that will be presented to council at its November meeting.

At the September council meeting, a motion was passed that members will ratify through referendum any compulsory parts of whatever CPD plan is proposed (p. 8, 37).

At the September meeting, council also decided that *Engineering Dimensions* would resume mailing printed copies to all recipients, beginning with our January/February 2016 issue. We'll still have the digital edition available to anyone who prefers reading their issues online. To get a digital edition instead of the print edition you will have to change the *Engineering Dimensions* delivery method in your online profile. Just click on the Pay Fees/Manage Account button on www.peo.on.ca and follow the steps to opt in to the digital edition.

It's almost election season again and PEO is, as always, looking for P.Engs who want to represent the profession on council. The Central Election and Search Committee is looking for members to run for the positions of president-elect, vice president, councillor-at-large, and regional councillor.

The 2016 Council Elections Call for Candidates (p. 39) outlines the positions available on council, what's required of candidates, and the deadline for declaring candidacy. For further information about becoming a candidate, please refer to the *2015 Council Elections Guide* available at http://peo.on.ca/index.php/ci_id/21663/la_id/1.htm.Σ

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Address all communications to The Editor, *Engineering Dimensions*, PEO, 40 Sheppard Avenue West, Suite 101, Toronto, ON M2N 6K9. Tel: 416-840-1062, 800-339-3716. Fax: 416-224-9525, 800-268-0496.

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Lively discussion a feature of PEO REGIONAL TOWN HALL MEETINGS

By Michael Mastromatteo

PEO is now halfway through a series of regional town hall meetings aimed at gathering member feedback on some key regulatory initiatives, including implementation of recommendations of the Elliot Lake Commission of Inquiry into the 2012 partial collapse of the rooftop parking deck of the Algo Centre Mall.

Scheduled from September 30 to November 12, the town halls were organized by President Thomas Chong, P.Eng., FEC, to discuss major issues of engineering self-governance, including continuing professional development (CPD) and a PEO specialist designation.

With a "You talk. We listen." theme for each town hall, Chong hopes the feedback gathered at the meetings will help ensure the best possible recommendations go forward to council and will inform council's decision making on them.

"These town halls are a follow-through from the Elliot Lake Commission recommendations," Chong said at the September 30 meeting in Ottawa. "PEO council will continue to consult with membership because your voice matters."

The September 30 meeting in Ottawa was moderated by John Hazel, P.Eng. Tracy Galicia, P.Eng., moderated the October 5 meeting in Sault Ste. Marie, with Karin Pratte, P.Eng., moderating the October 6 event in North Bay.

Each meeting included an overview from PEO Registrar Gerard McDonald, P.Eng., of the implementation status of the Elliot Lake inquiry recommendations calling for PEO action. These recommendations include one calling for PEO to put in place some form of continuing professional development program for Ontario's engineers within 18 months of the October 2014 release of the inquiry report, as well as a structural engineering specialist designation for those signing structural adequacy reports.

McDonald said that while PEO is not required to implement the inquiry recommendations exactly as written, the regulator must be prepared with well-considered arguments as to why it would not implement a recommendation or implement one differently than contemplated in the report. He said it would move the engineering profession forward to deal effectively with the CPD issue.

The town halls also featured reports from former PEO president Annette Bergeron, P.Eng., FEC, on the progress of PEO's Continuing Professional Development, Competence and Quality Assurance Task Force. Bergeron is chair of the task force, which, since May 2014, has been developing a proposal for a PEO CPD program.

Questions at each meeting have been numerous, with members showing a keen interest in the CPD proposal and possible specialist designation. The North Bay meeting also included questions about PEO progress in achieving proclamation of the repeal of clause 12(3)(a) of the *Professional Engineers Act*, known as the "industrial exception."

PEO has been making full use of social media (@PEO_HQ #PEOTownHall), as well as its traditional communications channels, to get news of the town hall meetings out to membership.

Background information, presentations delivered, and audio recordings of each town hall are available at www.peo.on.ca/index.php/ci_id/29011/la_id/1.htm.

MEMBERS TO HAVE FINAL SAY ON PEO CPD PROGRAM

By Michael Mastromatteo

PEO MEMBERS MUST approve by referendum any mandatory elements of a proposed continuing professional development (CPD) program the regulator implements.

At its September 25 meeting, PEO council approved a motion that affirmed its intent to ask membership to ratify any mandatory requirement to participate in CPD or quality assurance plans.

The move comes as the Continuing Professional Development, Competence and Quality Assurance (CPDCQA) Task Force continues its work developing a CPD program for Ontario's professional engineers. The task force was struck in 2014 following the release of an Ontario Society of Professional Engineers paper calling for mandatory CPD for Ontario engineers.

Chaired by former PEO president Annette Bergeron, P.Eng., FEC, the CPDCQA Task Force is continuing to refine the proposed program as it hears from members at PEO town hall meetings (see above).

Discussion on how to tailor a CPD program to the needs of Ontario's engineering practitioners was a key part of the six town hall meetings PEO held throughout the province September 30 to November 12.

At the September 30 town hall in Ottawa, PEO Registrar Gerard McDonald, P.Eng., assured members they will be fully consulted on the CPD matter. "Rest assured, membership will be asked whether they are supportive of any mandatory provision of CPD before it's put into place," McDonald said.

A report and proposal for a PEO CPD program will be provided to PEO council at its November 2015 meeting. The report will include recommendations to council on next steps.

PARTIAL MEETING OF MINDS **on building code dispute**

By Michael Mastromatteo

The engineering regulator is cautiously optimistic a September 3 meeting with officials from the housing ministry will lead to resolution of a long-standing dispute over changes to the Ontario Building Code.

PEO President Thomas Chong, P.Eng., FEC, along with Registrar Gerard McDonald, P.Eng., Deputy Registrar Johnny Zuccon, P.Eng., FEC, and Eastern Region Councillor Dave Brown, P.Eng., BDS, met with housing ministry officials to discuss PEO's objections to a proposed reintroduction of a building design table as an appendix the next time the building code is reprinted.

PEO objects to inclusion of the table based on the 2007 decision on PEO's legal challenge of certain building code amendments. PEO also believes use of the table by building officials to make decisions on when designs to support building permit applications are required to be signed and sealed by a professional engineer, an architect, or both might lead the building officials to inadvertently practise professional engineering.

The design table appeared in previous versions of the building code, but was removed as a result of the 2007 court decision, which found that allocating design activities between professional engineers and architects was outside the jurisdiction of the *Building Code Act*.

During the meeting, housing ministry staff agreed to hold off on reintroducing the design table into the building code. The minister's office will bring together PEO, the Ontario Association of Architects and the Ontario Building Officials Association (OBOA) to determine what problem would be solved by reintroducing the table into the building code.

In a September 4 letter to Housing Minister Ted McMeekin, President Chong said PEO looks forward to working with the ministry, the OBOA and the architects' association to address mutual concerns.

"We were encouraged by our discussion and pleased with your suggestion that before we pursue any particular solution, we should first have a common understanding of what problem it is we are trying to solve," Chong said.

HOUSING MINISTRY STAFF AGREED TO HOLD OFF ON REINTRODUCING THE DESIGN TABLE INTO THE BUILDING CODE.

Ontario opposition leader Patrick Brown (second from left) discussed pressing PEO concerns September 8 with Registrar Gerard McDonald, P.Eng. (left), and President Thomas Chong, P.Eng., FEC. Progressive Conservative Party MPP Sylvia Jones (right) also attended the meeting with the PC party leader.

PEO PRESENTS ITS CASE TO PC LEADER, LABOUR MINISTER

By Michael Mastromatteo

PEO HAD THE OPPORTUNITY to discuss some of its pressing issues September 8 at separate, private meetings with Ontario Labour Minister Kevin Flynn and new Progressive Conservative Party leader Patrick Brown.

Organized through the regulator's Government Liaison Program (GLP), the meetings allowed PEO to seek the labour minister's assistance in having proclaimed repeal of the industrial exception (clause 12(3)(a) of the *Professional Engineers Act*), and to introduce PEO and its positions on the industrial exception, Ontario Building Code changes, and implementation of recommendations of the Elliot Lake Commission of Inquiry to the new leader of the opposition.

PEO President Thomas Chong, P.Eng., FEC, and Registrar Gerard McDonald, P.Eng., represented the regulator at both meetings.

At the meeting with the labour minister, Chong and McDonald outlined PEO's case for proclamation of the repeal, and agreed to work closely with the labour ministry to find ways to resolve the issue.

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The exception, which exists only in Ontario, allows unlicensed people to do engineering work relating to equipment or machinery used to produce products for their employers. The regulator believes repeal of the exception would improve workplace safety in the province.

Chong and McDonald informed the labour minister of PEO's analysis of workplace accidents and expressed a desire for PEO to work more closely with the labour ministry to find a solution. PEO is now engaged in research with McMaster University that looks at links between workplace accidents and safety legislation.

In response, Flynn spoke of his ministry's commitment to preventing workplace injuries and fatalities in Ontario.

The meeting with PEO was one of the first since having been elected on September 3 for PC and opposition leader Brown. MPP Sylvia Jones, PC critic for the attorney general's office, also attended the meeting.

The PEO delegation briefed Brown and Jones on the regulator's response to recommendations of the Elliot Lake Commission of Inquiry, including development of a continuing professional development program for practitioners (see p. 8).

According to PEO government relations consultant Howard Brown, the opposition leader's staff was particularly interested in the repeal issue.

Brown offered to raise PEO issues in Question Period. He was scheduled to speak at PEO's Queen's Park MPP reception on October 21.

In a September 30 statement to *Engineering Dimensions*, Patrick Brown said the meeting with PEO leaders was especially helpful.

"I would like to thank Thomas Chong, the first visible minority president of Professional Engineers Ontario, and Gerard McDonald, PEO's registrar, for taking the time on September 8 to meet and update me on the work of their organization," Brown said. "I found the briefing to be engaging and informative.

"In particular, I was interested to learn about the progress they are making implementing the recommendations of the Elliot Lake inquiry. It is important that rigorous standards are upheld to ensure the safety of all Ontarians, and that tragedies like the collapse of the Algo Centre Mall in 2012 are avoided. I also enjoyed hearing about President Chong's plans to hold town hall meetings across the province."

Brown is looking forward to more opportunities to consult with PEO. "I have always said that experts–those involved on the ground floor–know best how to meet the pressing challenges of our province," he said.

Volunteers urged to look FOR THE BEST IN BEST PRACTICES

By Michael Mastromatteo

New thinking about organizational best practices dominated discussion at this year's Committee Chairs Workshop at PEO.

Held September 23 at PEO headquarters, the workshops are organized annually to help the regulator's committee and task force members better carry out their mandates.

The workshop also recognizes the valuable service of PEO's large pool of volunteers.

Chris Kan, P.Eng., chair of PEO's Advisory Committee on Volunteers (AVC) moderated the day's proceedings. Management consultant Jim Harris presented the best practice review activities. Author of the best-selling business book *Blindsided*, Harris also hosted last April's Volunteer Leaders Workshop. He said organizations should ensure that best practices don't become just "common practices," by simply mimicking what similar organizations are doing.

"To become a learning organization, it's important to PEO not to limit its thinking to what like-minded organizations are doing," Harris said. "Sometimes looking outside your industry or area of expertise can yield new ideas and, in turn, what are really new 'best practices.'"

Advisory Committee on Volunteers Chair Chris Kan, P.Eng., discusses informed decision making September 23 at PEO's annual Committee Chairs Workshop. Facilitator Jim Harris is at right.

Harris then led workshop participants through a software exercise aimed at helping committees and decision-making bodies gather data and make more informed decisions.

The software is also designed to help avoid problems related to limited communication, organizational blindspots, or allowing strong or dominant personalities to sway discussion at the committee table.

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Harris later emphasized the importance of task forces fully understanding their mandates and terms of references. He said misalignment of objectives or a misunderstanding of the problem to be solved are certain to undermine any committee's effectiveness.

"Dealing with change is the most important best practice you can incorporate as a committee," he said, adding that some of the most innovative corporations are those that best recognize and respond to changing conditions.

In the afternoon, participants formulated a list of what they saw as the most pressing concerns for the engineering regulator. One priority identified was the importance of gaining feedback from committee members and other stakeholders. "It's said that if you can't measure data, you can't manage it," Harris reminded attendees. "But real-time feedback, whether from individuals or committees, can be valuable in leading to positive behaviour change."

The workshop concluded with brief reports of the accomplishments of some PEO task forces and committees, and how they put best practices into effect.

The ACV's Kan said participants at last year's workshop had expressed an interest in learning from the experience and practices of other committees and task forces throughout PEO. He said his committee is now looking to improve its documentation and data collection to enable it to share the information with the entire PEO volunteer community.

Ottawa Chapter launches ENTREPRENEURSHIP PROGRAM

By Michael Mastromatteo

Tapan Das, P.Eng. (second from left), chair of the Ottawa Chapter's Innovative Entrepreneur Leadership Program, outlined the program details at a September 30 launch reception. Also attending were (left to right) OSPE Vice Chair Michael Monette, P.Eng.; Ottawa Chapter Treasurer Joe Podrebarac, P.Eng.; PEO Councillor Ishwar Bhatia, P.Eng., FEC; PEO President Thomas Chong, P.Eng., FEC; Registrar Gerard McDonald, P.Eng.; and OSPE Executive Director Sandro Perruzza.

PEO's OTTAWA CHAPTER has launched an entrepreneurship program that its leaders hope will cement ties between engineers and business leaders in the local community.

Officially launched September 30 after a successful pilot, the program is described as a way to influence, encourage and assist entrepreneurs throughout Ottawa and eastern Ontario to use their experience, skills and knowledge to innovate and create successful start-up companies.

PEO President Thomas Chong, P.Eng., FEC; Registrar Gerard McDonald, P.Eng.; Engineers Canada CEO Kim Allen, P.Eng., FEC; and OSPE Executive Director Sandro Perruzza were among the special guests attending the program launch. Chong spoke at the launch on behalf of PEO council.

Tapan Das, P.Eng., chair of the Ottawa Chapter Innovative Entrepreneur Leadership Program, said the effort will link expertise from industry, universities and entrepreneurship resource centres with aspiring entrepreneurs to ensure successful application of innovative science and technology to profitable new businesses.

Das says the chapter's entrepreneurship team will provide resources the entrepreneurs require, follow up on their progress, and provide further resources as needed, but is not responsible for ensuring the entrepreneurs' success.

The program will be tailored to the local community and make use of "best-placed" existing institutions to deliver the training and resources. A key element is to mentor engineers and entrepreneurs and refer them to appropriate parties for all program components.

The program's developers believe the Ottawa region is well suited for an entrepreneurial initiative. "Our unique strength lies in proactive collaboration across the engineering members of the Ottawa Chapter to influence, encourage and assist entrepreneurs throughout Ottawa and eastern Ontario to use their experience, skills and knowledge to innovate and

create successful start-up companies," the chapter said in a prepared statement. "In so doing, entrepreneurs and their start-up companies provide meaningful work for themselves and others in their chosen profession. The entrepreneurial program is working together with community resources, universities and academic institutions, professional societies, and government and private sector partners to achieve our vision of a thriving community that values and requires engineering talent."

The Ottawa Chapter ran a pilot project in June 2015 to test the waters. After noting a generally positive response, the chapter executive decided to roll the initiative out formally this fall.

Members of the chapter's organizing committee say they look forward to working with other chapters to create and deliver similar entrepreneurial programs of value to engineers, and welcome collaboration with other associations, especially the Ontario Society of Professional Engineers (OSPE), to develop, coordinate and implement the program.

THE CHAPTER's ENTREPRENEURSHIP TEAM WILL PROVIDE RESOURCES THE ENTREPRENEURS REQUIRE, FOLLOW UP ON THEIR PROGRESS, AND PROVIDE FURTHER RESOURCES AS NEEDED, BUT IS NOT RESPONSIBLE FOR ENSURING THE ENTREPRENEURS' SUCCESS.

Some of the immediate priorities for the chapter team include finding more volunteers, working with PEO, OSPE and the provincial government to obtain additional funding, and helping launch the program in PEO chapters throughout the province.

FAILURES CAN PROVIDE LESSONS IN ENGINEERING ETHICS

By Michael Mastromatteo

Former OSPE chair Paul Acchione, P.Eng., had words of advice about professional ethics for newly licensed engineers.

A former president and chair of the Ontario Society of Professional Engineers (OSPE) urged new engineers to stay within their technical competence zones as they begin their professional careers.

Speaking September 17 at PEO Oakville Chapter's licence certificate presentation ceremony, Paul Acchione, P.Eng., drew on his 30 years of experience with Ontario Hydro and Ontario Power Generation (OPG) for lessons in engineering ethics.

Acchione served on the OSPE executive from 2012 to 2015 and chairs its Energy Task Force. He is also a management consultant with Midac Corp.

In discussing engineering ethics, Acchione cited a 1994 pipe break incident at one of OPG's nuclear power facilities as an example of what engineers can learn from failures.

He urged newly licensed engineers to become aware of all the laws and regulations that apply to professional engineering practice, especially the *Professional Engineers Act*, regulations 941 and 260, and the practice guidelines published by PEO. "There is really no excuse for not knowing what laws and regulations apply to the work you are doing," he said.

Acchione said many of the problems associated with engineering failures stem from lack of communication and consultation among principals involved in a project, rather than from mechanical or design flaws.

He urged new practitioners to seek help when needed from qualified personnel and to avoid straying into unfamiliar practice areas. "As engineers, you are not expected to know everything," he said, "but you are expected to know what you don't know."

Prior to the licence certificate presentation, Oakville Ward 6 Regional Councillor Tom Adams brought greetings from the city's mayor, Rob Berton. He praised PEO's Oakville Chapter for its "amazingly active" record of service, and urged new licensees to consider applying their professional skills close to their local community.

Among the guests were PEO President Thomas Chong, P.Eng., FEC, who outlined the regulator's plan to gather feed-

"YOU ARE THE DREAMERS, DESIGNERS AND PROBLEM-SOLVERS READY TO TACKLE THE PROBLEMS OF THE 21ST CENTURY."
Indira Naidoo-Harris, MPP (Halton)

back from the membership at upcoming town hall meetings.

Other guests included PEO councillors Danny Chui, P.Eng., FEC, and Warren Turnbull, P.Eng., and Halton MPP Indira Naidoo-Harris, who said that in joining PEO new licensees are now members of "one of the most important organizations" in Ontario. "You are the dreamers, designers and problem-solvers ready to tackle the problems of the 21st century," Naidoo-Harris said.

Thirty-six new engineers received their licence certificates during the event. The Oakville Chapter also presented scholarships to local high school and university students. The evening was hosted by Oakville Chapter Chair Sohail Naseer, P.Eng., and Certificate Presentation Coordinator Parisa Mahdian, P.Eng.

ENGINEERS FOUNDATION steps up scholarship funding by 50 per cent

By Jennifer Coombes

The Ontario Professional Engineers Foundation for Education has increased its scholarship funding to the province's 15 engineering schools by 50 per cent or $50,500. A total of $153,000 is now up for grabs each year, which means, as of September, the foundation is able to provide more than 100 engineering students with scholarships worth $1,500 each.

Scholarships are provided to students, with a proportion set aside for women, who meet the criteria of high academic achievement and also demonstrate leadership in their communities–qualities the foundation believes will cultivate future engineers who are not only technical experts but leaders who will contribute to the engineering profession and society in a meaningful way.

Says Foundation President Marisa Sterling, P.Eng.: "At a time when STEM pursuits are seen as critical to economic development we needed to address the affordability imbalance of an engineering education. The general escalation of university tuition and fees has left many students paying upwards of $100,000 to complete a four-year bachelor degree. Only with the continued generosity of P.Engs who donate to the foundation when they pay their dues can we now help even more of the brightest young people achieve their dream of becoming an engineer, while alleviating some of their debt load as they begin their careers."

The Ontario Professional Engineers Foundation for Education is a registered charity. For more information about the foundation or to make a donation, visit www.engineersfoundation.ca.

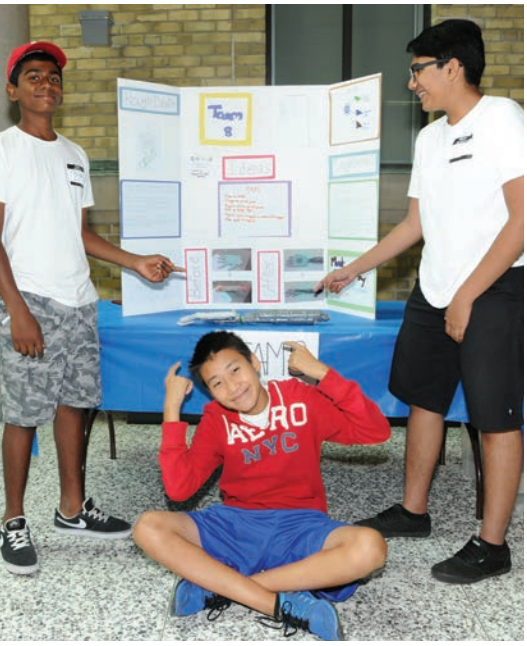
Kids discover excitement of engineering at WIES Design Competition

By Hilary Whiting, EIT

A team of girls put their heads together to solve an engineering design problem at the 2015 WIES Design Competition.

IN AUGUST, PEO's West Toronto Chapter teamed up with the Toronto Rehabilitation Institute (TRI) and University of Toronto's faculty of applied science and engineering to show local youth what engineering is all about through the Women in Engineering and Science (WIES) Design Competition. The hands-on competition took place over the course of two weekends and engaged over 50 students in grades 6 to 9 and 30 volunteers in projects involving engineering design and prototype building.

Through the keynote address by TRI Director Geoff Fernie, PhD, P.Eng., participants learned



The WIES Design Competition promotes a collaborative environment open to all ideas, so this year the competition welcomed both boys and girls.

not only about how cool and fun engineering is, but also about the vital roles engineers and scientists play in solving society's tough problems.

The goal of the WIES Design Competition is to engage youth and promote a diverse and collaborative environment that is respectful of and open to ideas brought forward by all. For that reason, this year's competition was open to both girls and boys, with boys making up about half of the participants.

To align with the theme of this year's competition–the 2015 Parapan Am games–participates were tasked with designing and building a prototype of a prosthetic arm. They worked in teams of three or four, along with an engineering mentor who studies or works in the field. The groups came up with innovative and thoughtful designs, which were judged based on strength, cost efficiency and creativity. The winning teams were recognized for their user-centred designs and clearly communicated ideas.

NEM 2016: THERE'S A PLACE FOR YOU!

By Alan Ham

There is a place for you in engineering! This is the message engineers across Canada will convey to youth and other members of the public during National Engineering Month in March 2016. Large-scale, coordinated outreach events have the ability to make waves in public consciousness. The aim is to let people know engineering is a field that is open to anyone who is interested, and that society benefits from a profession that is diverse and creative.

In Ontario, PEO and the Ontario Association of Certified Engineering Technicians and Technologists (OACETT), in partnership with Engineers Without Borders (EWB) Canada, delivered 275 events last March through event support, funding assistance, promotion, and on-the-ground outreach. This collective effort inspired elementary and high school youth, delighted their parents, and informed the public about the role engineering plays today and in the future.

To be part of NEM 2016, apply to organize an event! PEO chapters receive up to $700 each to organize NEM events. Collaborating with OACETT, EWB, new founding partner the Ontario Society of Professional Engineers (OSPE), the Engineering Student Societies' Council of Ontario, or other community organizations is highly encouraged. For the third consecutive year, "Innovation Funding" is available for anyone who has a new, groundbreaking idea for an engineering outreach event.

The deadline to submit an application to receive NEM funding is November 13, 2015. To get an application or more information, visit nemontario.ca/professionals-portal/,

A student raises her arms in victory at the 2015 NEM bridge-building competition in Sudbury. Photo: Rebecca Bose

contact your chapter, or email us at nem@peo.on.ca.

You're also invited to subscribe to our *Engineering Outreach* newsletter, which helps connect outreach enthusiasts from across the province. Sign up at nemontario.ca/engineering-outreach-resources.

Engineers often serve society's needs from behind the scenes so they, as a profession, deserve a month in the year to celebrate and promote their work. PEO, OACETT, OSPE and EWB plan to continue growth in this campaign by emphasizing not only what engineering is, but why engineers do it. NEM is truly an inspiring experience, for the youth who attend our events and for the hundreds of volunteers who get satisfaction from talking about their work. On behalf of PEO, OACETT and OSPE, we look forward to working with you to make March 2016 another memorable month.

CONFERENCE PRESENTERS PREDICT continuing professional development for ALL SELF-REGULATED PROFESSIONS

By Michael Mastromatteo

Continuing professional development (CPD) programs will almost certainly come on stream for all self-regulating professions, say presenters at a recent education conference organized by the Council on Licensure, Enforcement and Regulation (CLEAR).

Held September 17 to 19 in Boston, the conference brought together officials from regulators in North America and Europe to discuss trends in self-regulation and licensing of professions.

Founded in 1985, CLEAR comprises agencies and organizations involved in professional and occupational regulation and licensing.

Ontario's engineering regulator, a supporting member of CLEAR, was represented at the conference by Deputy Registrar, Regulatory Compliance Linda Latham, P.Eng., Moody Farag, P.Eng., manager of admissions, and Ken Slack, P.Eng., manager of complaints and investigations.

Several of the conference presentations focused on CPD. One session looked at CPD as an element in "registrant engagement," with a second looking at an outcomes-based model for professional development. Most CPD programs today depend on members completing courses to demonstrate CPD, but a new model would see participants completing projects to an agreed-upon level of quality to indicate their professional progress.

Other issues discussed at the CLEAR conference included protecting human rights in registration practices and assessing international qualifications.

The Ontario Office of the Fairness Commissioner (OFC) was well represented at the conference with its discussion of Canadian work experience as a requirement for licensing and registration.

The question of character assessment also came under discussion, with the December 2014 incident at Dalhousie University's dental college–in which several male students were suspended from clinical work for sexist comments on social media about female classmates–the subject of a presentation. The question was whether a regulatory body should have access to information about student behaviour while in a program leading to licensure. At a time when social media can put a spotlight on a would-be applicant's past indiscretions, some regulators are reviewing where to draw the line when it comes to character assessment.

Another presentation of note examined strategies for regulators in dealing with an aging licence holder population as part of a comprehensive risk-management policy.

Bruce Matthews, P.Eng., a former PEO deputy registrar and now president of Simplifico Inc., a consulting company with expertise in regulatory affairs, attended the CLEAR conference and presented on the topic of transparency in regulators' operations.

A member of the CLEAR conference organizing committee, Matthews says the annual gatherings bring a new perspective to wider regulatory issues.

"Interestingly, Canadians made up the single largest contingent of attendees, with Americans being a close second," Matthews told *Engineering Dimensions*. "A huge spectrum of regulated professions and occupations were represented. The diversity of perspectives is what makes CLEAR such a great conference to attend."

Matthews said regulators of all stripes are under ever-increasing scrutiny, not just by the governments that oversee them, but also by the media. "It's critical that regulators be outward looking and proactive in facing and dealing with these challenges," he said. "It is critical to recognize and accept that if regulatory excellence is to be achieved. There is no challenge that PEO is currently facing that hasn't been faced by other regulatory organizations. While the solutions adopted by these other organizations may or may not be suitable in PEO's context, it is still important to seek them out and learn rather than reinvent the wheel."

In addition to its annual educational conference and biennial international congress, CLEAR conducts an annual seminar series in several North American cities, including Toronto. The topic for next year's seminar is quality assurance in professional regulation.

P.ENGs URGED TO CONSIDER MENTORING OPPORTUNITIES

By Michael Mastromatteo

AN IMMIGRANT ADVOCACY group is encouraging professional engineers in the GTA to mentor new Canadians hoping to work as engineers.

The Mentoring Partnership, a program of the Toronto Region Immigrant Employment Council (TRIEC), says it needs engineering managers to assist up to 39 mentees with engineering backgrounds.

PEO has been involved with TRIEC since 2004, when former PEO registrar Kim Allen, P.Eng., FEC, took part in bridging programs for internationally educated engineering professionals.

TRIEC says the need for mentors is especially acute in the electrical, chemical, civil, industrial, manufacturing and metallurgical engineering sectors.

The Mentoring Partnership (TMP), which has facilitated more than 10,000 mentoring relationships between skilled immigrants and Canadian professionals, recently celebrated its 10th anniversary.

Margaret Eaton, executive director of TMP, says mentoring benefits both mentor and mentee.

"It's a win-win situation for everyone: skilled immigrants benefit from the leadership, inside knowledge and resources of their mentor," Eaton says. "Meanwhile, the mentor gets the opportunity to develop their leadership and coaching skills, while also positioning themselves as a leader in their industry."

More than 75 per cent of all mentees in the mentoring partnership are employed in their field within 12 months of starting the program. A 2014-2015 TMP survey noted that 95 per cent of mentors, after participating in the program, reported they better understand the challenges internationally educated professionals face in staying within their chosen career. Ninety-six per cent of mentors reported an improved ability to motivate, coach and develop colleagues.

Mentors commit to a total of 24 hours over a four-month period. While most of the interaction is in person, mentors can also support their protégés online or over the telephone, and can offer referrals for informational interviews.

Saleha Hussain, P.Eng., an engineer with the city of Toronto, got involved with TMP in 2006. Although she is no longer involved with the program, she is quick to describe the benefits to both mentor and mentee.

"The benefits received from participating in The Mentoring Partnership program are intrinsic in nature," Hussain says. "Every mentee reminded me of my time as a new immigrant when I was a teenager, and the struggles that my family faced upon their arrival for trying to find a job to make ends meet."

Hussain also helped steer some recent immigrants on the path to registration. "If I were working with a mentee, I would have critiqued their resumes and given them some resources to explore in terms of their accreditation with PEO," she says. "Furthermore, I would have tried to keep the communication upbeat to spark some positivity into their lives. Joblessness can be a devastating time for a family, so I would have made sure to talk to them and remind them about the higher objectives of their decision to move to Canada or for choosing engineering as their profession."

PEO members can find more information on mentoring partnership opportunities at www.triec.ca or TheMentoringPartnership.com.

Due to a PEO council decision, with our January/February 2016 issue, we'll resume sending **print editions to everyone by mail.**

Unless you tell us otherwise...

Our digital edition is still available, but to receive it instead of the print edition, you must "opt in." If you prefer to read your issues online, go to **www.peo.on.ca**, click the Pay Fees/Manage Accounts tab and change the *Engineering Dimensions* delivery preference in your online profile back to the digital edition (be sure to have your licence number handy).

[IN MEMORIAM]

THE ASSOCIATION HAS RECEIVED WITH REGRET NOTIFICATION OF THE DEATHS OF THE FOLLOWING MEMBERS (AS OF SEPTEMBER 2015).

ARMITAGE, John H.
Mississauga, ON

BABCOCK, Michael Robert
Saskatoon, SK

BATEMAN, Paul John
Deep River, ON

BELINA, Jelena
Islington, ON

BERGGREN, Robert Lorne
North York, ON

BRUCE, Daniel Rufus
Mahone Bay, NS

CAMERON, Albert Malcolm
Sault Ste. Marie, ON

CAMERON, Cedric Stuart
Waterdown, ON

COOPER, William
Vancouver, BC

DOYLE, Edward
Burlington, ON

FARKAS, Gabriel
Seguin, ON

FIELDING, John Michael
Oshawa, ON

FOURNIER, Joseph Rosaire Louis
Greely, ON

FUNG, Dennis C.Y.
Mississauga, ON

GAMSBY, George Douglas
Guelph, ON

GANDIER, Joseph Robert
Ottawa, ON

GARNETT, Jack Barker
Scarborough, ON

GASCOIGNE, Arnold
Brampton, ON

GELLER, Lorant B.
Ottawa, ON

GEMMELL, Harold Gregory
Barrie, ON

GIRARD, Marc Arnold
Grimsby, ON

GIUSTI, Domenico
Stouffville, ON

GLASS, Roger William
Oakville, ON

HAMMILL, John Howard
Mississauga, ON

HANGARTNER, Rolf
Welland, ON

HANNA, Milad Hennawy
North York, ON

HART, Christopher Carleton
Cobourg, ON

HAVE, Alex Dalsgaard
Wasaga Beach, ON

HAYTER, Donald MacGregor
Mississauga, ON

HEELEY, Frederick Stanley
Ancaster, ON

HERNANDEZ-VENEGAS, Pedro
Oshawa, ON

HINTON, Lloyd G.
Fenelon Falls, ON

HODGSON, Wayne Lyle
Brighton, ON

HOWE, Thomas Gifford
Toronto, ON

JACKSON, Hugh Allen
Mississauga, ON

JACKSON, Laurence Edward
Nepean, ON

JAEGER, Hans Heinz
Burlington, ON

JAMANI, Hassanali
North Bay, ON

JONES, Padraigh Gullen
Gananoque, ON

JUUSE, Gunnar
North York, ON

KAOUD, Sami Abu
Mississauga, ON

KAVANAGH, Dermot John Lawrence
Nepean, ON

KEAST, John David
Sudbury, ON

KEMBEL, Walter William
Shuniah, ON

KRUPICZ, Stanley Edward
York, ON

KURTZ, Isaac Zvi Meyer
Toronto, ON

LALONDE, Frank George
Kirkland, QC

LAM, David Chak-Kwong
Markham, ON

LAVIGNE, Mervyn
Haileybury, ON

LEAVOY, Wayne Paul
Sudbury, ON

LEHMANN, George Francis
Cambridge, ON

LOCKWOOD, Geoffrey Richard
Kingston, ON

LYNCH, George David
Hamilton, ON

MACKERACHER, James Wilkie
Collingwood, ON

MADUGULA, Murty Kumara Satyanarayana
Rochester Hills, MI

MALINSKY, Grant Francis
Ottawa, ON

MANNING, Ralph Edward
Markham, ON

MARADYN, Jack Walter
London, ON

MARCELISSEN, John Theodore
Beaconsfield, QC

McCABE, Bruce Wayne
Hillsburgh, ON

McMANUS, John David
Ottawa, ON

MOKOMELA, William Edward
Thunder Bay, ON

MOULTON, Ronald Edward
Kitchener, ON

MURRAY, John Pearson
Pickering, ON

NASH, Robert Frederick
Mulmur, ON

NOY, James Anthony
Perth, ON

OPTIS, Brendan Alexander
Stouffville, ON

PARNYA, Mykhaylo
Niagara Falls, ON

PATEL, Baldev Karsandas
Niagara Falls, ON

PATEL, Harshadbhai Purushottamdas
Newmarket, ON

PAVSKI, Nikolai
Hamilton, ON

PEICK, Horst Richard Herman
Cambridge, ON

PERITY, Ferenc Gyorgy
Scarborough, ON

PERREIRA, Desmond Claude
Pickering, ON

PICKETT, John Clarke
North York, ON

PIENKOW, Wladimir
Thornhill, ON

PINDER, Bennison Frank
Frankford, ON

PINT, Andres
Toronto, ON

POTTER, Brian Keith
Kitchener, ON

POUNDER, James David
St. Catharines, ON

RAMAN, Narasimha Kalyan
Oakville, ON

RANDLE, Wayne Garfield
Oakville, ON

REA, Vittorio Luigi
Windsor, ON

REARDON, Christopher Michael
West Vancouver, BC

ROBBINS, Donald Herbert
Winnipeg, MB

ROEDER, Gordon Alan
Burlington, ON

ROGER, Gerald Michael
Burlington, ON

ROGERS, James A.
Victoria, BC

ROGERS, John Henry
Mississauga, ON

SANTO, Robert Keith
Ottawa, ON

SAUNDERS, Gerald Stanley
Ottawa, ON

SCHARFENBERG, Roland
Kincardine, ON

SCHULHOF, Gavril
Windsor, ON

SEMPLE, Paul Gerard
Oakville, ON

SHARPE, Paul Gordon
Moncton, NB

SISKNA, Uldis
Whitby, ON

SLINGERLAND, Francis Walter
Nepean, ON

SMART, Terence John
Collingwood, ON

SNOWDON, Glen Robert
Locust Hill, ON

STAINES, Leon Bruce
Wawa, ON

STEWART, John Arthur
Kingston, ON

STIENSTRA, Lewis
Mississauga, ON

TANTOVIC, Rusmir
Kingston, ON

TAYLOR, Earle Moore
Toronto, ON

THORNILEY, Brian Henry
Haileybury, ON

TIIVEL, Mati
North York, ON

TREMBLAY, Mousseau Joseph Louis Philippe Guy
Verdun, QC

TRIGLAV, Walter
Etobicoke, ON

TURNER, John Douglas
Scarborough, ON

URIE, William Arthur
Kingston, ON

VALDEZ, Hector Ramon
Windsor, ON

VARGA, Stefan
North York, ON

VRANA, George
Gananoque, ON

WADE, Michael George
Kingston, ON

WALKER, Michael Peter Joseph
Markham, ON

WALLACE, Reginald Stanley
Kanata, ON

WESTMORE, Roger
Stittsville, ON

WILLIAMS, David Harry
Eustis, FL

WINCH, Edmund Martin Plaisted
Hamilton, ON

GOVERNMENT LIAISON PROGRAM HELPS PEO DELIVER ITS MESSAGE

By Howard Brown

The Ontario legislative building houses the lieutenant governor of Ontario, the legislative assembly and offices for MPPs. Photo: Jeannette Chau, P.Eng.

PEO HAS EFFECTIVELY regulated the profession in the public interest for 93 years and the Government Liaison Program (GLP), in place now for a decade, helps PEO get its message to government. The program allows engineer volunteers to elevate the profession's position among members of provincial parliament (MPPs), build professional and personal relationships with politicians, and learn more about the profession and how government works.

Many of PEO's volunteers have taken full advantage of the opportunities afforded them by the GLP. Councillors, chapter chairs and other chapter executive members attend events and meetings to discuss issues relevant to PEO and the profession.

George Comrie, P.Eng., FEC, PEO president-elect, has been a longtime volunteer for PEO and was in his first term as president when the GLP was founded in 2005. "I have always found it interesting to get to know politicians and what their issues are–before telling them what our issues are," Comrie says. "Everyone who comes to see them wants something from them. And, we do, too. So we need to have our 'ask' framed clearly."

Sadiq Parani, P.Eng., York Chapter's past GLP chair, says: "The GLP has helped me understand the political system and build strong relationships with MPPs who belonged to all major political parties, as well as local municipal leaders."

Hafiz Bashir, P.Eng., Kingston Chapter's GLP chair, is one of two chapter chairs on the Government Liaison Committee. Bashir remarks: "The GLP enhances the presence of PEO at the local level, especially with the local public representatives and local government officials. This ultimately gave us the opportunity to brief them about the act, and the role and jurisdiction of PEO."

So, what approach might GLP volunteers use to get the attention of an MPP?

Jagmeet Singh, MPP (Bramalea-Gore-Malton), deputy NDP leader, told PEO at the 2013 East Central and West Central Regions GLP Academy and Congress the three things that get a politician's interest are their voters, their volunteers and their donors.

At PEO's Western Region GLP Academy and Congress in Collingwood earlier this year, then PC Interim Leader Jim Wilson, MPP (Simcoe-Grey), a guest speaker at the event, echoed a similar statement, advising participants to "be visible, be friendly and donate."

One of the main advantages of the GLP is having relationships firmly in place with MPPs when there are important issues at hand requiring the assistance of government, or when there is an opportunity to provide engineering input to a policy decision.

"Having a government liaison program is similar to having life insurance: it provides a safety net for when we might need it," says Charles Kidd, P.Eng., PEO Eastern Region councillor.

Syed Gilani, P.Eng., past GLP chair of the Sudbury Chapter,

NDP HOUSE LEADER GILLES BISSON, MPP, STOOD UP IN THE HOUSE OF COMMONS AND COMMENDED PEO FOR ITS STRONG GOVERNMENT LIAISON ACTIVITIES AND SUGGESTED OTHER PROFESSIONS WOULD DO WELL TO EMULATE THEM.

recognized how intertwined engineering issues and the government are. He says: "I strongly believe PEO is a stakeholder in government and public policy. Any policy that impacts the engineering profession or has the potential to impact P.Engs should be reviewed and discussed before its implementation."

It has taken years, but the government is now consulting with engineers more and more on legislation before it's proposed.

Indeed, NDP House Leader Gilles Bisson, MPP, stood up in the House of Commons and commended PEO for its strong government liaison activities and suggested other professions would do well to emulate them.

The 66 amendments to the *Professional Engineers Act* made in 2010 are a good example of that collaboration. But the work is never done. PEO still has work to do to have the repeal of clause 12(3)(a) of the act, the industrial exception, proclaimed by the end of 2020 or the legislation will have to be reintroduced.

There are new act changes being proposed, stemming from the Elliot Lake Inquiry recommendations, that will require PEO to work with MPPs to bring forward new legislation.

In addition, there is work to do to ensure the Ontario Building Code doesn't encroach on PEO's jurisdiction, which requires continual monitoring and follow-up.

"Only a strong GLP network can ensure PEO's mandate to regulate the profession in the public interest," says Jeannette Chau, P.Eng., PEO's manager of student and government liaison programs. "We've worked very hard to have the engineering voice heard, and the GLP is a great enabler of that. We must continue to be vigilant and proactive. The coming months and years will require all engineers to work together to ensure PEO's jurisdiction is respected. I am confident that the GLP will continue to facilitate that."

Please contact Chau at jchau@peo.on.ca if you have any questions or would like to get involved with the GLP. Σ

Howard Brown is president of Brown & Cohen Communications & Public Affairs Inc., and PEO's government relations consultant.

WHO WILL YOU NOMINATE?

The **Ontario Professional Engineers Awards** recognize professional engineering excellence in innovation, leadership and entrepreneurship, and honour contributions to society as well. For 2015, an exciting new award category has been added to recognize a project or achievement by a team of professional engineers that has had a significant impact on society, industry or engineering.

OPEA eligibility requirements and nomination forms are available at **www.peo.on.ca.**

The nomination deadline is Wednesday, February 24, 2016.

OPEA CALL FOR NOMINATIONS

Nominations are being accepted for the 2016 Ontario Professional Engineers Awards (OPEA).

Now in their 69th year, the OPEAs showcase Ontario professional engineers who have made outstanding contributions to their profession and community. Nominate an exceptional engineer or a team of engineers who have led a successful engineering project. OPEA recipients are honoured annually in November at a black-tie gala hosted jointly by the Ontario Society of Professional Engineers and Professional Engineers Ontario.

PROFESSIONAL ENGINEERS AWARDS

THE AWARDS

GOLD MEDAL

The premier award, the Gold Medal recognizes commitment to public service, technical excellence and outstanding professional leadership.

ENGINEERING PROJECT OR ACHIEVEMENT AWARD

This new award recognizes a team of engineers who have conceived of, designed and executed an outstanding project or achievement that has had a significant, positive impact on society, industry or engineering.

CITIZENSHIP AWARD

Those who earn this award have given freely of their time, professional experience and engineering expertise–to the benefit of humanity.

ENGINEERING MEDAL

The Engineering Medal recognizes professional engineers who have improved our quality of life through the ingenious application of their engineering skills, and whose achievements rise significantly above the normally high standards of the profession. It can be awarded in the categories of:

Engineering Excellence
Recognizes overall excellence in the practice of engineering, where the innovative application of engineering knowledge and principles has solved a unique problem, led to advanced products, or produced exceptional results

Management
Awarded for managing and directing engineering projects or enterprises, where innovative management practice has contributed significantly to the overall excellence of the engineering achievement

Research and Development
Awarded for using new knowledge in developing useful, novel applications or advancing engineering knowledge or applied science, or discovering or extending any of the engineering or natural sciences

Entepreneurship
Awarded for applying new technologies or innovative approaches that have enabled new companies to get started, and/or assisted established companies to grow in new directions

Young Engineer
Awarded to outstanding young Ontario engineers who have made exceptional achievements in their chosen fields. Candidates must be no older than 35 as of December 31 in the year the nomination is submitted and have demonstrated excellence in their careers as well as in community and professional participation

ELIGIBILITY

More information about the awards, including selection criteria and nomination forms, is available at www.peo.on.ca, or by email at awards@peo.on.ca.

THE DEADLINE

Nominations are due by 4 p.m. EST on **Wednesday, February 24, 2016,** but they may be submitted at any time during the year.

PRACTITIONER-CENTRED RESEARCH PROJECT LAUNCHED... PARTICIPANTS WANTED!

By Jordan Max

IN AN EVER-CHANGING world, how can PEO anticipate, respond and adapt to changes in professional engineering practice?

The first step is getting answers to questions like: When do you contact PEO for practice advice? Why (or why not)? How useful are professional practice bulletins, guidelines or standards in helping you improve your practice or integrate new expectations? What other issues, questions, products, services or formats could also be helpful?

To find answers to some of these questions, PEO is embarking on its first practitioner-centred research study–a "deep dive" research project to examine and better understand professional engineering practice in Ontario from the practitioner's (not PEO's) vantage point.

To do this, we'll need professional engineers as volunteer participants. Volunteers will help us get a more accurate picture of what goes on in professional practice and allow us to determine better what public safety risks might exist, where and when those risks might emerge, which professional practice elements still need to be regulated, which ones don't, and which ones could be regulated in a different way, for example, through voluntary compliance. If you aren't currently practising professional engineering, we'd also like to know why.

SPECIFICS OF THE PROJECT

Our study of licence holders will help us discover more about:

- if and how you practise professional engineering on a daily, regular or occasional basis;
- how you advance and improve your professional practice;
- what factors, besides reporting to PEO, influence your practice behaviour (e.g. competition, personal ethics, suppliers, client relationships, business alliances, insurance, professional development, etc.);
- how, when and why you interact with PEO (or why not) on professional practice issues; and
- the impact of PEO's services and communications (e.g. discipline hearing decisions and reasons in *Engineering Dimensions*, practice bulletins/guidelines, town hall meetings, etc.) on how you improve your professional practice.

This research is markedly different than any online survey or consultation PEO has done in the recent past. While it may use focus groups, interviews, shadowing, discussion and observation methodologies, this research is not being driven by a current regulatory policy initiative. We want to listen to *your* practice story.

The outputs of this research will be "persona" segments of the licence holders, essentially telling us who they are, and their needs, goals and motivations, as well as "journey maps" of their interactions with PEO on professional practice issues, which will reveal our members' experiences with us at various times. Companies and organizations use these experiences and insights to identify their users' "pain points," frustrations and opportunities for service improvements, and to develop ideas for, prototype and test new approaches, products, processes and services. For PEO, deeper understanding of our practitioners' perspectives and the factors having an impact on them will help us in future policy development work, to innovate or upgrade policies or services for professional practice, and to suggest more effective regulatory policy or operational improvements.

HOW YOU CAN HELP

We are looking for two kinds of study participants: licence holders and companies holding a Certificate of Authorization. The study may involve a variety of the methodologies mentioned above. Your participation in this research is voluntary. PEO will engage a consultant with extensive experience in both the private and public sectors to conduct the research.

Wherever possible, the research will be conducted in a participant's workplace, but it is *not* a practice review or audit of the workplace. Our consultants will not enter any workplace without a participant's agreement. All input will be treated confidentially and, if used later, will be made anonymous.

While PEO cannot compensate participants for their time, it will share the findings with them prior to publication. So, when you are contacted by PEO to participate in our practitioner-centred research project, please say "yes"! Σ

WHAT IS PRACTITIONER-CENTRED RESEARCH?

Practitioner-centred research (PCR) is the empathetic foundation of design thinking–an increasingly employed user-focused method of driving innovation in top businesses, education and even government. This approach is generally used to develop a deep understanding of users' experiences with service providers to suggest possible improvements. Its two major outputs are "personas" of different user segments and "journey maps" that illustrate why, when and how users interact with a service provider (including both successes and frustrations).

Jordan Max is PEO's manager, policy.

[GOVERNANCE]

REGULATION, ADVOCACY AND MORE: UNDERSTANDING PROFESSIONAL ORGANIZATIONS

By Sharon Aschaiek

PUBLIC INTEREST and personal interest: they are the two overarching principles that affect the way engineers operate. Committing to the first is a requirement of practice essential to ensuring public safety; focusing on the second is important for individual advancement in the profession. In Ontario, these two principles are supported by a variety of organizations, and understanding their objective and functions, and their involvement with the engineering profession, is important for knowing your rights, responsibilities and opportunities as an engineer.

TYPES OF ORGANIZATIONS

Regulator

Engineering is a self-regulated profession in Ontario governed by Professional Engineers Ontario (PEO) under the authority of the *Professional Engineers Act* (PEA), a provincial statute. As the regulatory body for the province's 80,000 engineers, PEO has a mandate to protect and serve the public, and to ensure individuals and companies providing engineering services uphold a strict code of professional ethics and conduct. PEO's primary functions are providing licences to qualified engineers, and disciplining those who are found guilty of professional misconduct. PEO's role also involves developing competent and ethical professional engineers by establishing standards of practice that must be followed by all members of the profession. As a comparison, PEO fulfills the same role for engineering as the College of Physicians and Surgeons of Ontario for medicine, the Law Society of Upper Canada for law, and Chartered Professional Accountants of Ontario for accounting.

"PEO, in legal terms, is an authority that the government has delegated to oversee the profession," says George Comrie, P.Eng., FEC, president-elect of PEO and principal of George Comrie Consulting Services. "Our acid test is not how well we conduct chapter events for members. Our priority has to be on our core regulatory functions. Our deal is that we have to put the public first."

Advocacy

Professional associations and advocacy groups respond to the concerns, and advance the professional and economic prospects, of their members. Such organizations serve engineers in a variety of ways, including advocacy, professional development and member events. In this way, they are similar to advocacy groups in other professions, such as the Ontario Medical Association, the Human Resources Professionals Association of Ontario and the International Association of Business Communicators.

Key among these types of groups in the province that serve engineers is the Ontario Society of Professional Engineers (OSPE), a member-interest advocacy organization created in 2000 by PEO and the Canadian Society of Professional Engineers to separate regulatory and non-regulatory affairs for the engineering profession.

"We look after the economic interests of engineers, and ensure that when the government is establishing public policy, either at the federal or provincial level, they take the engineering perspective into consideration," says Sandro Perruzza, CEO of OSPE.

Other organizations in Ontario that focus on serving the best interests of engineers include Consulting Engineers of Ontario–which is a member of the national advocacy group Association of Consulting Engineering Companies–the Ontario Network of Women in Engineering in Ontario, and the Ontario Municipal Engineers Association.

Learned societies

Also known as learned academies, scholarly societies or academic associations, learned societies are organizations that further the body of knowledge relating to a profession, an academic discipline or an area of study. Usually non-profits, and usually country- or internationally based, these groups are like clubs where membership may be open to all, or to those with certain qualifications. In engineering, such groups include the Canadian Society for Chemical Engineering and the Institute of Electrical and Electronics Engineers. In other professional milieus, such groups include the Royal Astronomical Society of Canada and the National Geographic Society.

Hybrids

Hybrid organizations perform a mix of functions that may include regulation, advocacy and/or advancing the knowledge of a field. Within Canada's engineering profession, most other provincial regulators fall into this category in that they serve to protect both the interest of the public and the professional interests of engineers. Another example is the Ontario Association of Architects, a self-regulating organization overseen by the provincial government's *Architects Act* that also engages in government advocacy and provides professional resources for its members.

REGULATION VERSUS ADVOCACY

While a wide range of organizations can be associated with a profession, most fall into one of two broad categories: serving the public, or serving the profession. The first category has only one organization, the regulator, while the second can have multiple groups. As the regulator of engineering in Ontario, PEO stands out from all other groups in that its primary purpose is licensing and discipline, and its advocacy function extends to promoting what is good for the public by ensuring its practitioners meet rigorous practice standards.

By contrast, the second category can have an unlimited number of representative bodies. The main objective of groups such as OSPE and others like it is to serve the professional and economic interests of their members. The value of having separate groups for conducting regulation and advocacy within any profession and, in this case, engineering, is that it makes it possible to avoid a conflict of interest between protecting the public and protecting members of a profession, which can arise when one organization performs both functions.

"PEO is the self-regulating body that enables professional engineers to carry on their practice according to their oath or according to best practices to serve society…If engineers want to get involved in shaping public policy in the public domain, how governments are regulating this particular activity, whether there's an engineering solution to a societal problem, they can join OSPE in those pursuits," says Gail Krantzberg, director of the engineering and public policy program at McMaster University. "It puts too much tension within PEO for it to have both functions…because it becomes a bit blurry as to how the institution is going to balance its regulatory requirement versus other member activities."

Here's a further breakdown of how PEO as Ontario's engineering regulator differs from the dominant advocacy group for the profession in Ontario, OSPE.

Mandate, authority and accountability

PEO's mandate is to regulate the practice of engineering in Ontario in the public interest. The organization has been delegated this authority from the provincial government to self-regulate the profession, which includes governing licence holders, as well as holders of Certificates of Authorization, temporary licences, provisional licences and limited licences. The organization is accountable to the government through the PEA, and to the public, as it is governed by laws requiring it to serve and protect the public interest.

OSPE is the only association in Ontario with a mandate to represent the province's entire engineering community. Its mission is to support, represent and advance the interests of engineers, as well as to promote engineering excellence for the benefit of the public. OSPE derives its authority from, and is accountable, only to its members.

Membership–admittance and benefits

Membership within PEO is mandatory for all engineers who require and successfully obtain a licence to practise in the province. The organization does not recruit members, but promotes licensure for all engineering graduates who want to practise engineering, and provides information on how to obtain a licence. Membership in OSPE, on the other hand, is optional, and the organization recruits to attract new members. OSPE has approximately 14,000 members consisting of professional engineers, engineering graduates and students.

As a regulator, PEO does not provide its members with benefits in addition to a licence to practise engineering. OSPE provides its members with a wide range of benefits that include advocating to the government for their best professional interests, professional development training, career services, mentoring, networking events and savings on relevant products and services.

"We don't just comment on an issue, we provide solutions to government," says Perruzza about the society's advocacy work. "That's where governments are starting to see the value that engineers are providing. We're forecasting issues before they become issues and try to put solutions in place."

Governance and influence

PEO is governed by a council, the composition and operation of which are dictated by the PEA. Most councillors are elected by PEO's licensed membership, and some are appointed by the lieutenant governor of Ontario; appointed councillors may or may not be professional engineers. PEO Registrar Gerard McDonald, P.Eng., is responsible for staff implementation of PEO council decisions and policies. Members can have influence on the operation and governance of PEO by participating in committees, task forces, chapters and other groups and initiatives, and by voting in PEO council elections.

"The organization depends on the members of the profession to do a lot of the work…and members have a huge say in how PEO runs. There is a significant number of volunteers involved in our operation," Comrie says.

OSPE, meanwhile, is governed by a board of directors with nine members, each of whom is elected to a three-year term by OSPE members. All board members are professional members of OSPE and, as such, are professional engineers licensed by PEO. As with PEO, members of the society can play an active role in shaping its policies by volunteering on committees and voting in elections.

"They've [OSPE] got subcommittees dealing with whatever topical issues the membership wants to tackle," Krantzberg says. "It's an opportunity for an engineer who's interested in a particular field, or a new development, or a new technology that's either being misused or could be used better, to get that message out to government."

Co-operation

While PEO and OSPE each have distinct purposes and activities, the groups do work together in a few areas of common interest. Some of the joint projects and initiatives the organizations collaborate on include jointly hosting the annual Ontario Professional Engineers Awards, supporting National Engineering Month, and partnering on policy advocacy work and on events relevant to both groups' members. As well, both groups participate in a joint relations committee to discuss mutually relevant issues.

"We have to have a common understanding of who is supposed to do what, and who should be involved in what," Comrie says. "If we could broaden the consensus on what everybody's role is, it would allow us to…maximize the extent to which we work together, in areas where we can, and we would all get more done and do a better job." Σ

HEART OF THE MATTER

Materials poised for new prominence in wider profession

By Sharon Aschaiek, Nicole Axworthy, Jennifer Coombes and Michael Mastromatteo

It has been described in words ranging from the "backbone" of the engineering profession to "a bridge" between the pure sciences and engineering practice.

It's closely identified (and sometimes confused) with metallurgy and mechanical engineering, and it plays an ever-increasing role in forensics and the study of why some materials undergo catastrophic failure.

But despite its centrality to the profession, materials engineering isn't widely understood or appreciated, and some materials practitioners in Canada lament the dearth of distinct materials engineering departments at Canadian engineering schools.

This obscurity is troubling to some materials specialists in other ways, especially considering the discipline's imperative to draw from other engineering practice areas: chemical, mechanical, metallurgical, mining and more, to delve into the very heart of what materials to use, how to fit them together, what new materials might be created, and how the finished products will operate in the real world.

At its most basic, materials engineering is the study of all the things we see around us every day. Materials engineers study different groups of materials–metals and alloys, polymers, ceramics and composites–and develop new materials for new applications. They also work to improve existing materials to give better performance and look at ways in which different materials can be used together.

Materials engineering evolved from the field of metallurgy, one of the very first disciplines of engineering. This accounts for the lingering over-association of materials with metallurgy today. Subsequent to the massive development of new metals and alloys during the first half of the 20th century, new classes of non-metallic materials based on engineered ceramics, plastics and composites emerged.

To reflect the widening spectrum of materials classes, metallurgy departments expanded and were renamed–as in the case of the University of Toronto (U of T) and others as materials science and engineering.

The university, one of the few Canadian universities that still has the word "materials" showing up in its engineering school description, tells prospective students that materials engineers focus on improving what

things are made of and how they are made. New materials, in turn, enable better performance and sustainable technologies.

The University of Alberta (U of A) is one of the few institutes in western Canada to retain a materials department. "In materials engineering," advertises the department of chemical and materials engineering at U of A, "a scientific approach is taken to improving the performance of materials in real-world situations by examining the relationships between their structure, properties and processing. This concept can be applied to a wide variety of materials, including metals, ceramics, polymers and composites."

Comondore (Ravi) Ravindran, PhD, P.Eng., professor of advanced materials and manufacturing processes at Ryerson University in Toronto, is one materials specialist who can speak to the discipline's extensive reach.

"Materials science is the knowledge of materials," Ravindran told *Engineering Dimensions*. "It is the application of this knowledge. Every engineer applies this knowledge in some measure and, therefore, there is embedded materials engineering in every field of engineering."

Ravindran, recipient of a 2012 Engineering Medal for research and development from the Ontario Professional Engineers Awards (OPEA), is also director of Ryerson's Centre for Near-net-shape Processing of Materials and a member of practically every professional association linked with materials science. He is one of only 11 Canadians named as a fellow in the American Society for the Advancement of Science (AAAS).

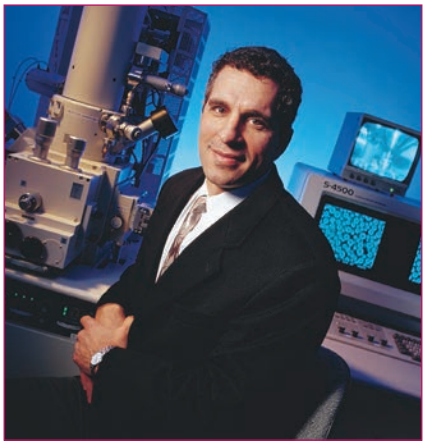
At his lab, Ravindran supervises a group of students doing basic and applied research in casting light alloys (primarily aluminum and magnesium), and cast irons using different casting methods. His work is vital in the development of lighter-weight engine parts in the automotive and aeronautical industries.

Armed with several years of private industry experience as a process development metallurgist with Manitoba Steel Rolling Mills, Ravindran expects his students to keep real-world applications in mind with their research projects.

"We live in a world of materials," Ravindran says. "Everything is material–metals, alloys, composites, polymers, wood. Engineers need to understand the composition of materials, their structure and properties, in order to develop processes, products and services for the benefit of society. In other words, the materials are effectively engineered into products and services. Thus, all branches of engineering function and thrive on a good understanding of materials. Materials are the backbone or the building blocks."

This is a view supported by Carolyn Hansson, PhD, P.Eng., professor of mechanical and mechatronics engineering at the University of Waterloo. A recent recipient of the Order of Canada for her research, Hansson came to Waterloo after several years as head of materials engineering at Queen's University in Kingston.

Carolyn Hansson, PhD, P.Eng., professor of mechanical and mechatronics engineering at the University of Waterloo, says all other engineering areas draw on materials engineering.



Doug Perovic, PhD, P.Eng., professor of materials science and engineering, says materials engineering has a low profile because it tends to be overshadowed by more traditional disciplines.

Materials specialist Ravi Ravindran, PhD, P.Eng. (second from left), in his Ryerson lab with grad students (from left) Suleman Ahmed, Eli Vandersluis, EIT, and Anthony Lombardi, PhD, EIT.

She regrets that budget cutbacks led to Queen's merging its materials department with mechanical engineering, a move copied by other universities in North America.

"I would say other engineering areas, particularly civil, electrical, aeronautical and mechanical, all draw on materials because you can't make anything without making it *out* of something," Hansson says. "So you may design a wonderful circuit, but until you figure out if you can make it *out* of the materials, it won't go anywhere. The other thing is whether those materials are going to survive in the environment that

your application is going to be in. That's one of the things many people forget about."

Doug Perovic, PhD, P.Eng., professor of materials science and engineering at U of T and co-director of the university's Ontario Centre for the Characterization of Advanced Materials, suggests one reason for materials engineering's low profile is its tendency to be overshadowed by more traditional disciplines.

"Materials engineering overlaps with all other disciplines of engineering, most notably mechanical and chemical," Perovic says. "However, whereas the other disciplines primarily design with materials, materials engineering is a skill set focused on the design *of* materials. Where other engineers design and build architectures, machines and processes with materials, materials engineers design and build architectures, machines and processes *within* a material."

The lack of profile for materials is ironic in a way, Perovic adds, considering that materials engineering became "interdisciplinary" long before the term came into fashion. "Materials engineering draws on all other disciplines where necessary, since materials are the fundamental basis for virtually all technologies. The cross-fertilization of knowledge from other engineering disciplines and from nature through 'biomimicry' leads to radical advances in materials for new products and industries. Breakthroughs in the engineering of materials have defined all ages of civilization and continue to be a critical path to solving society's most challenging technological problems.

"The materials engineer develops knowledge on the interrelationship between structure-processing-properties-performance of all materials classes such that engineering designs are not only defined by existing materials, but create newly discovered materials that launch novel engineering designs and products," he adds.

It remains to be seen if the next generation of engineering students will cotton on to materials' potential as a potential career. But given its strong links with industry, manufacturing and innovation, a new appreciation for materials engineering's virtues may be in the offing.

For Hansson, the many benefits of materials engineering, though still not widely understood, could inspire a new interest in the discipline. "I think it's fun for students to study materials simply because it helps explain the 'why' of what they already know. Ultimately, though, you have to look at the new applications. This is where I think it should be important for other (engineering) disciplines to rediscover materials."

The following examples of materials engineering show the range of innovative materials that play a supporting role in furthering all areas of engineering.

ADVANCED COATINGS THAT REALLY STICK

Everyone knows that hockey players–at least in the wooden stick era–would wrap their blades in protective tape to shield the business end of the stick from the wear and tear of shooting, passing, slashing and, occasionally, scoring.

It was a rudimentary form of protective coating that, prior to the introduction of composite hockey sticks, extended the life of a player's most basic piece of equipment.

But the idea of a protective coating takes on much greater meaning and significance to materials engineer Javad Mostaghimi, PhD, P.Eng., distinguished professor of plasma engineering, U of T, and director of the university's Centre for Advanced Coatings Technologies (CACT).

Mostaghimi's main research interests include the study of thermal spray coatings, "transport phenomena" and electro-magnetics in thermal plasma sources. In addition, he is involved in the study of flow, temperature and electromagnetic fields within direct current arcs and radio frequency inductively coupled plasmas.

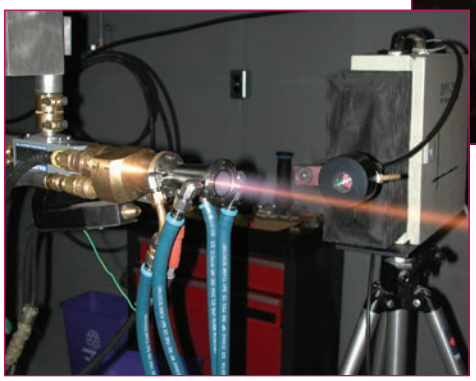
He has also produced simulations of the dynamics of "droplet impact" and solidification in thermal spray processes and automotive spray painting–essentially representations of how fluids or other coating materials might adhere to the surfaces they are introduced to.

Mostaghimi is a fellow of the major materials engineering societies, including the American Society for Metals. In November 2009, he received an OPEA Engineering Medal in research and development for his efforts with thermal coatings.

"Thermal barriers, corrosion and wear-resistant coatings are examples of such coatings," Mostaghimi says. "For example, thermal barrier coatings are applied to turbine blades in a gas turbine. Different sources of energy are used for melting powders and wires. These could be combustion-based or plasmas, that is, partially ionized gases and arcs."

Some of his most promising research involves coating turbine blades with the thermal barrier, zirconia. The coating allows air to flow to and cool a blade so it can withstand temperatures of greater than 1000 C. The coating preserves the efficiency gains of high-temperature operation, while protecting the blade itself from the extreme heat.

Right, Javad Mostaghimi, PhD, P.Eng., distinguished professor of plasma engineering and director, Centre for Advanced Coatings Technologies, U of T, operates a wire-arc coating deposition system.



Left, a high-velocity, oxy-fuel spraying system is used to replace hard chrome electroplating for coating landing gears.

This work satisfies one of the basic challenges of the materials engineer. It's all well to conceive of and develop a new material, but it must also survive all the rigours of real-world operating conditions.

Mostaghimi's advanced coatings research also has wide applicability in the airline industry. His materials are applied to different parts of an aircraft, allowing them to better withstand heat, repel moisture and even resist corrosion.

At CACT, Mostaghimi oversees the collaborative research work of U of T's departments of mechanical engineering and materials science. Established in 1998, the centre conducts fundamental research, both analytical and experimental, in the area of thermal spray coating.

The centre more recently moved into new state-of-the-art laboratory facilities at the university's Bahen Centre, which enables further work into thermal spray application systems, including atmospheric plasma spray, high-velocity oxy-fuel spray and wire-arc spray methods.

Among the most fundamental and long-term studies undertaken at CACT are studies of the impact of molten droplets on a surface and how they deform and make a splatter, formation of the coatings and prediction of their microstructure, and temperature and electromagnetic fields in a "DC plasma torch."

An exciting new application for the coatings work involves improvements in the way municipalities handle waste material–including converting it to a power source.

"With regards to municipal waste, coatings can be very helpful in resisting corrosion at high temperatures," Mostaghimi says. "High-temperature corrosion is a problem in many processes. Nickel-based super alloys are one type of coating that is suitable for these applications. The components are normally built out of manufacturing-friendly materials, such as steels, but by depositing a layer of high-temperature, corrosion-resistant materials, these components will have much longer lives."

In some waste treatment operations, he adds, plasma can be used to "gasify" the waste and generate syn-gas ($CO+H_2$): "The syn-gas may then be used to generate electricity. This is an application called plasma gasification."

But as Mostaghimi's research brings more consistency to the properties of new coating materials, it also benefits from positive collaboration with other disciplines, especially chemical engineering and even nanotechnology.

"The chemical processing and the pulp and paper industries are major users of this (coating) technology," he says. "As you can imagine, there are many processes that are corrosive and/or cause wear.

Mostaghimi's group is now working with the University of Ontario Institute of Technology on hydrogen production by a copper-chlorine cycle. "Due to the corrosive nature of some of the reactors used in hydrogen production, we are developing a proper coating for them," he says.

In a useful overlap with nanotechnology, the advanced coatings team has also developed a nano-structured ceramic coating described as "super-hydrophobic." Mostaghimi explains that super-hydrophobic surfaces are those with a "water contact angle" greater than 150 degrees. "These surfaces repel water and

have great applications, and I believe this is the first time that ceramic super-hydrophobic coatings have been developed. Other super-hydrophobic coatings exist, but they are polymeric and thus they wear out much faster compared to ceramics."

Given such potential, it's little surprise that Mostaghimi regards his advanced coating work as "an enabling technology," one that allows engineers and researchers to extend the range and usefulness of materials coming on stream. His research has been said to bring more rigour to an area that in the past was more trial-and-error-based.

"Coating technology used to be more an art than science," he says.

STUDENT START-UP AIMS TO STROKE OUT SUNBURN

Canadian start-up Suncayr is attempting to alleviate the dangers of the summer sun with an innovative colour-changing marker that tells you when your sunscreen is no longer protecting you.

The marker, which looks like a standard Crayola felt-tip marker, contains a specific combination of materials that creates a UV-sensitive, non-toxic ink. Users draw on their skin with the marker and then put on their sunscreen. When the protection wears off, the ink reacts with the sun's UV rays and turns purple. Once the ink is re-covered with sunblock, it turns clear.

The Suncayr marker was created by a group of former University of Waterloo nanotechnology engineering students: Derek Jouppi, Rachel Pautler, Andrew Martinko, Chad Sweeting and Hayden Soboleski. The team came up with the concept as part of a fourth-year Capstone Design project, which challenged them to invent a technology that solves a problem in their daily lives–in this case, they tackled the frustration of forgetting to reapply sun protection with an effective, easy-to-use product.

According to the Canadian Skin Cancer Foundation, more than 80,000 Canadians are diagnosed with skin cancer each year. Skin cancer is preventable, and the reapplication of sunscreen is one of the greatest challenges to staying safe in the sun.

With these stats in mind, Suncayr has the potential to be a practical tool in preventing skin cancer. The appeal of using a marker, the company says, is that drawing on your skin can be fun, making Suncayr a more enjoyable experience for adults and children alike. By drawing ink on your skin, you can get the most accurate knowledge about how sunscreen is protecting you. You can draw or write anything you want, and you have control over the area of application, so you can apply in areas that are most commonly sunburned, like the top of your forearm or your shoulder.

The materials in the marker's ink are water and sweat resistant and leave no tan line, and the colour change is reversible. When you're outside at the beach, you can expect the product to last without chipping or flaking for about six hours. To remove the ink, founders suggest a hot shower with soap and scrubbing will remove it best. Makeup remover will also take it off.

The founders plan to market the product to parents with children between the ages of three and 10, and expect that it will appeal to a broad customer base, particularly in sunny areas of the Unites States.

While a novel idea, one of the company's biggest challenges so far, according to Suncayr's CEO Rachel Pautler, has been the chemical composition of sunscreen itself. "The active ingredients in sunscreen are not very soluble, so non-standard solvents are used to keep everything in solution," Pautler explains. "At first, these solvents also dissolved our ink and removed it from the skin, so we've had to do a lot of work to ensure our ink will last on your skin for several sunscreen applications."

The majority of the marker's active ingredients are already commonly found in marker inks and cosmetic products. They've also introduced a novel UV-responsive dye and several ingredients to increase the ink's durability and ability to mimic skin so that it doesn't wipe off. This new material in the marker–the UV pigment–is being tested by toxicology experts to determine its safety, and the Suncayr team plans to supplement these studies with clinical trials.

"We've optimized the UV-responsive colour change and durability of our ink," explains Pautler. "We're working right now to enhance the amount that the ink mimics skin to ensure that sunscreen will come off our ink at the same rate that it comes off your

The Suncayr team, from left: Sahej Bakshi, Andrew Martinko, Rachel Pautler, Derek Jouppi, Peter Mucha and Chad Sweeting.

The Suncayr team has introduced a novel UV-responsive dye, allowing users to see when they need to apply more sunscreen.

skin. We're also optimizing other cosmetic qualities, such as the shelf life, and comfort of the ink on skin."

The company is working out of the University of Waterloo's Velocity Foundry, a free workspace for student start-ups, and with over $100,000 in grants and awards, including one from the University of Waterloo and the Communitech Women Entrepreneurs Bootcamp. The students were also runners-up of the James Dyson Award in 2014 and received a grant to further develop, test and, ultimately, commercialize their project.

After nearly two years of work, Pautler says the company is in the process of taking the idea to the masses: "We've received approval from Health Canada to sell the Suncayr marker and are working hard to get our manufacturing ready to launch in stores by next summer."

NO MICROBE LEFT BEHIND WITH NEW GENERATION OF NON-STICK SURFACES

Slippery surfaces aren't always a good thing. But sometimes they are–especially when you want to prevent blood from coagulating in a medical device like a heart valve or catheter, deter mussels from attaching to filters at a water treatment plant, reduce bacterial contamination in hospitals, or inhibit ice formation on airplane wings.

Making materials that nothing will stick to is the primary focus of Benjamin Hatton, PhD, EIT, an assistant professor at U of T's department of materials science and engineering.

Prior to his current post at U of T, he and his team at Harvard University had been working for some time on the challenging problem of developing non-adhesive, non-wetting surfaces that would work for both hydrophobic (repels water) and hydrophilic (mixes with water) materials. They could make "superhydrophobic" surfaces that would work in the short term, but not in the long term, particularly under harsh conditions. About five years ago they were running out of options for materials that could perform this function, until a team member came up with the idea of trapping a thin, slippery liquid layer on surfaces, similar to how carnivorous pitcher plants catch their insect prey. It came to be known as SLIPS (Slippery Liquid-infused Porous Surface).

"We decided to generalize the idea to design materials that trap thin, lubricant layers on surfaces at the micro scale as a really robust way of making very slippery, non-adhesive, non-wetting surfaces. This was a turning point," says Hatton.

They initially chose a perfluorocarbon, which is a class of liquids that don't mix with anything else, to create the first, truly

Benjamin Hatton, PhD, EIT, in his lab at U of T. Hatton is developing surface coatings that will repel everything that comes into contact with them.

omniphobic (i.e. repels everything) surface. "We made a fluorinated surface with a layer of fluorinated liquid energetically bound to it and found that it repelled ice, ketchup, bacteria...it's the first example of a surface that repels absolutely everything," Hatton says. He says the coating is reasonably long-lasting and works because the liquid layer is energetically bound and wets the surface preferentially. Nothing is able to displace it.

Their findings were published in *Nature* in 2011 (www.nature.com/nature/journal/v477/n7365/full/nature10447.html), a paper that has been cited over 450 times since then. Hatton says people are realizing that now there is a way to repel anything you want to for practical applications like biomedical devices, water filters, and so on.

It was about that time, while Hatton was working at Harvard's Wyss Institute for Bio-inspired Engineering, when a grant request came in from DARPA (the Defense Advanced Research Projects Agency). The agency was concerned with the number of soldiers being lost to blood-based bacterial infections (sepsis) and wanted to design an external medical device to take blood from a patient, identify bacteria, separate them out, and return the blood to the patient. Blood is sterile in the absence of infection, so any bacteria found would indicate potential sepsis. Separating bacteria from blood would require it to be run through tiny microchannels that are prone to clotting, however. So the challenge was finding a material surface that blood wouldn't stick to and clog the device.

"It was a tricky problem," says Hatton. "Nobody had ever achieved this before. If you put anticoagulants into the blood you reduce the clotting that's going to happen in the device. For a normal, healthy patient, that's okay. But for wounded soldiers, the elderly or very sick, giving anticoagulants can be dangerous."

So, they proposed to use this new SLIPS surface design to effectively prevent blood clots from adhering. The results of that project were published last year in *Nature Biotechnology* (www.nature.com/nbt/journal/v32/n11/full/nbt.3020.html). "It's quite an exciting project, and what's great is it really combined our materials engineering discovery with a clinical need. It was lucky timing," Hatton says.

Hatton has been back at U of T for three years and is further developing this idea. He has traded in perfluorocarbon for a silicone version of the coating because it's easier to engineer for a range of surfaces or devices. "One of the limitations of perfluorocarbon is that you need a reservoir of liquid if you want the surface to last a long time. You need to replace the liquid when it wears away," he explains. So Hatton designed a silicone polymer with lubricant dissolved into it. The liquid permeates the polymer and is also present as a thin layer on the surface, which creates a built-in reservoir that acts as a self-lubricating material.

His group is now testing the surface for its antibacterial qualities using various strains commonly found in bacterial infections, like staphylococcus aureus, under different growth conditions. The surface has shown promise for use in applications like medical devices because it has been observed to reduce bacterial growth by between 1000 and 10,000 times, as compared to normal silicone in 15-day growth trials.

"These slippery surfaces work really well for devices like endoscopes that have to be cleaned after each use to prevent transmission of infection from one patient to another. We're working on these kinds of applications because the devices are much easier to clean when designed this way. Bacteria simply don't adhere to them. Indwelling devices like urinary catheters or endotracheal tubes that stay in place for weeks or months are another area. We're interested in how using almost the same plastics and polymers as the devices themselves we can engineer them to be highly non-stick," Hatton says.

"There are a lot of situations where having a truly non-stick surface just changes the game. You have adhesion problems with so many different industries. There's never been an easy solution to it so industries have just had to live with the problem," he says. Until now.

LEVERAGING SHAPE MEMORY MATERIALS TO PROMOTE WELL-BEING

Shape memory–a property of smart materials that lets them return from an altered state to their original shape in response to an environmental stimulus–is well-known among materials engineers. But what's new are all the promising applications of this function being explored by material sciences engineer Hani Naguib, PhD, P.Eng.

As principal investigator at the Smart and Adaptive Polymers & Composites Laboratory at U of T, Naguib is creating a wide range of what he calls smart, active materials and structures, such as multifunctional polymers, or plastics, that can be used to improve everything from robotic limbs to surgical tools to wound recovery.

"The idea of having smart materials that can activate based on an external stimulus and can perform certain functions is really exciting for me," says the mechanical engineering professor, who is the Canada research chair in smart and functional materials. "It can lead to innovations in the biomedical field and so many other different areas."

One area that stands to benefit from Naguib's research is prosthetics. Since 2003, he has been working on achieving a prosthetic arm featuring specialized actuators and sensors that would allow for lifelike mobility. He and his team have fabricated artificial muscles and joints that use very fine, lightweight, biodegradable fibres containing shape memory polymers that can be programmed to return to preprogrammed shapes with the application of heat. Specifically, they are manipulating the microstructure and nano-structure of the materials, and then exposing them to electrical charges to thermally condition them to change and restore their shape.

For a material to be useful to its intended users–individuals with an injured or missing arm–Naguib says it must optimally perform in three muscle function areas: speed, force and deformation. Currently, the muscle Naguib has developed can allow for movement as fast as milliseconds, but this still isn't as fast as the human body. As well, it can carry up to two kilograms of weight, and the goal is for it to carry up to 20 kilograms.

"We need the material to work as fast as possible, because when you close and open your hand, it's very fast," says Naguib, who is also director of U of T's Toronto Institute of Advanced Manufacturing, which provides organizations with research and development, training and education in advanced manufacturing. "It also needs to be able to carry a certain weight…and deformation will enable the hand to return to its original position."

The bionic arm, which Naguib expects to finalize and commercialize within the next three to four years, isn't the only innovative application for shape memory polymers being fleshed out at his lab. Another involves using the substance to enable medicine to help patients recover from illness more quickly and effectively. Specifically, Naguib has developed a sponge-like biodegradable material for drug delivery that squeezes and releases liquid drugs when it has reached the right spot in the body.

Hani Naguib, PhD, P.Eng., principal investigator at the Smart and Adaptive Polymers & Composites Laboratory at U of T, has created artificial muscles and joints using biodegradable fibres combined with shape memory polymers that can be programmed to return to preprogrammed shapes with the application of heat.

In this case, the polymer is trained to open and close in response to exposure to a specific degree of heat. This could be our body's normal temperature of 37 C, or the exact temperature of each of our organs, which are typically a bit warmer than our general body temperature. If medicine is placed inside, it will only be released once the material senses the precise temperature of the target body area with a wound or infection. Naguib says the material could be adapted to the minute differences in body temperatures that exist in each patient.

In addition to controlling the timing of the drug's release into the body, Naguib is also investigating how to manipulate the speed of the release–specifically, how to extend the drug's delivery over a longer period of time to make it more effective. As well, he wants to see if it's possible for the material to act as a type of tourniquet that can stop bleeding and seal a wound. He is currently working on a skin patch system, but he is also investigating an ingestible solution.

This modulated approach to drug delivery would increase the efficiency of the medicine, Naguib says, which would mean patients would be able to recover more quickly, and may decrease or even eliminate the need for multiple doses of pills.

"The idea is to make the recovery phase more effective for the patient," Naguib says. "It will definitely decrease the time by which patients are taking the drugs, and allow them to heal more quickly."

MATERIALS OPTIMIZATION THE ESSENCE OF INTEGRAN'S WORK

Mississauga-based Integran Technologies Inc. has won numerous awards and patents since its founding in 1999 for its many contributions to the advancement of materials science and engineering in Canada.

Most of the new materials it has brought to market over the last 16 years benefit the aerospace, nuclear and defence industries, but it's the company's work with a new-generation hockey stick that is bringing it more recent attention.

In an application of its patented Nanovate technology, which serves to make composite parts stronger and more durable, Integran was instrumental in developing the new Colt brand hockey stick now used by some elite National Hockey League players.

Although not a part of its core business line, the stronger, more durable Colt hockey stick developed by Integran Technologies demonstrates many of the product enhancements made possible with its patented Nanovate technology.

Incorporating greater strength and energy into the stick shaft, the Colt gives hockey players more speed and power in their shooting–all the while reducing the chance of a dreaded mid-shaft breakage that occurs with other composite hockey sticks.

Earlier, Integran applied its Nanovate technology to the production of hybrid golf club shafts, which, like hockey sticks, put more energy into a golfer's swing.

Though it's a small part of Integran's extensive line of commercial products, the hockey stick and golf club experiences demonstrate the tremendous versatility inherent in materials engineering.

"It's all about materials optimization and development of hybrid structures," says Integran President and CEO Gino Palumbo, PhD, a graduate of U of T's materials science and engineering program.

"Effective materials engineering can only be executed using a multi-disciplinary approach involving a broad range of engineering, such as chemical, mechanical, metallurgical, industrial and electrical, and by involving such areas as solid state physics, electro-chemistry, business and related disciplines."

Armed with his materials engineering training, and 20 years' experience in the nuclear side of the former Ontario Hydro (now Ontario Power Generation), Palumbo saw Integran as an opportunity to take the benefits of materials development in multiple new directions.

Integran bills itself as a metallurgical nanotechnology company whose technologies focus on the engineering of the internal structure of materials on a near-atomic scale to yield "super materials" that meet exacting performance requirements of new products.

The company's core technologies grew from innovative multi-disciplinary research and development carried out at Ontario Hydro's research division in the 1990s. This research was conducted in collaboration with researchers at Queen's University and U of T. The company to this day maintains its strong collaboration with U of T.

In many ways, Palumbo and Integran represent the best of materials engineering and its impact on the development of stronger, more resilient and generally enhanced products across a wide spectrum.

A small souvenir Integran staff offer to guests and visitors–a ping pong ball coated with the company's high-strength Nanovate material (thus rendering it practically indestructible)–makes a simple but convincing statement as to what can be achieved by the careful selection and manipulation of materials.

"One of our core competencies is our ability to design, engineer and manufacture ground-breaking new products based on combining very high strength (nano) metals with polymers and carbon fibre composite materials," says Jonathan McCrea, PhD, P.Eng., Integran's vice president of technology. "These hybrid structures deliver unique properties not achievable with monolithic designs. A good example of this is the Colt hockey stick."

Integran holds one of the first patents in nanotechnology with its work on the Electrosleeve process for repairing CANDU reactors and is now widely used to extend the life span of generators in nuclear power plants.

Because much of Integran's core business involves defense and military industries, the company is limited in how it describes its unique technology. Despite the confidential nature of some of its processes, however, Integran is quite open about its position as a leader in metallurgical nanotechnologies. It is motivated to continually develop lighter, better and cheaper products based on its Nanovate nano-crystalline metal platform.

Not surprisingly, the company's archives are filled with reports of its successes in materials innovation. "We're not a commodity materials producer or supplier, but rather a true materials engineering company," McCrea adds. "We serve leading organizations where advanced materials drive competitive advantage or where existing material solutions fall short. Global 500 companies in aerospace, defense, biomedical and heavy industries turn to us for materials innovations. Our collaborations deliver value by enabling new products, weight savings, cost competiveness and reduced environmental footprints." Σ

COUNCIL VOTES TO HOLD MEMBER REFERENDUM ON CPD REPORTING

502ND MEETING, SEPTEMBER 24, 25, 2015

By Jennifer Coombes

COUNCIL AFFIRMED at the September meeting its intent to ask the membership to ratify through referendum any mandatory requirement to participate in a PEO continuing professional development (CPD) program.

Under council's direction, the Continuing Professional Development, Competence and Quality Assurance Task Force (CPDCQA TF) has, since 2014, been developing a proposal for a program of CPD and quality assurance that takes into account whether a P.Eng. is practising or not practising professional engineering. Council got its first look at the task forces's proposed program at the May council meeting (see *Engineering Dimensions*, July/August 2015, p. 22). Feedback from a series of town hall meetings (see p. 8) held in the fall throughout the province will be incorporated into the task force's final proposal. The task force is scheduled to report to council at its November meeting.

RESCINDED COUNCIL MOTIONS

Council has rescinded several previously passed motions as part of PEO's ongoing work to ensure the policy intents, stakeholders, and quantitative and qualitative impacts for any proposed regulation fulfill the attorney general's (AG) preliminary regulatory impact assessment requirements, which were introduced in January 2014. The AG's requirement is part of the government's new emphasis on evidence-based policy and applies to all current and future regulation amendments under development.

PEO's Legislation Committee identified that the following passed council motions do not meet the AG's threshold for clear policy intent and, as a result, have not yet and cannot be drafted into regulation. The rescinded motions dealt with Certificates of Authorization and licensing requirements:

Certificate of Authorization (C of A)

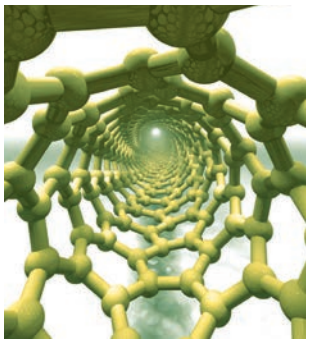
- that the online membership directory identify all licence holders who carry, or do not carry, professional liability insurance, and by the discipline (CEAB degree or PEO syllabus) in which they are licensed;
- that, for a nominal fee, a check-box on the application for licence for a sole practitioner be provided to indicate that he/she will be providing services to the public, and to denote if he/she carries professional liability insurance;
- that discipline-specific seals be issued, and additional seals be issued to licence holders who can demonstrate competence in additional discipline(s);
- that all engineers offering engineering services to the public be required to be listed on the initial C of A application and annual renewal form;
- that the signing officer of a firm be required to sign a declaration acknowledging awareness of the requirement of section 50 of the regulation that PEO be advised of any changes to an organization's information (e.g. mailing address) within 30 days;
- that PEO validate the services offered on a C of A are supported by competent licence holders with the discipline(s) that support its scope(s) of practice as stated on its application;
- that services offered by the holder of a C of A be listed in the online directory;
- that limitations be imposed on the number of certificates a licensee can be responsible for;
- that PEO have powers of inspection built into the act to follow up on whether Cs of A who have opted for compulsory disclosure are providing clients with a disclosure notice;
- that PEO ensure C of A holders provide proper, professional working conditions (i.e. that P.Eng. decisions are not overridden by unlicensed individuals, thereby giving P.Engs more control over the professional engineering activities of a firm); and
- that practitioners be required to file a declaration of competency on an annual basis.

Licensing

- that a new regulation be added to cover licensing of applicants already registered in another jurisdiction with which PEO has a mobility agreement, by which such applicants will be deemed to meet all requirements for licensure except for the good character requirement with the following provisions:
  - (a) the applicant has successfully passed a professional practice examination in a Canadian jurisdiction or has been licensed to practise professional engineering in a Canadian jurisdiction for at least five years,
  - (b) the applicant has provided satisfactory evidence of having at least 12 months of Canadian experience that meets the requirements of subsection 33.(3)3 of the regulation, and
  - (c) the applicant has not previously applied to PEO for a licence and been deemed to not meet the academic requirements.
- that PEO delete all reference to the number of examinations required in each category of each syllabus. Σ

[DATEPAD]

NOVEMBER 2015



NOVEMBER 8-10
4th Sustainable Nanotechnology Organization Conference, Portland, OR
susnano.org

NOVEMBER 9-10
Healthcare Innovation Point-of-Care Technologies Conference, Bethesda, MD
hipt.embs.org/2015

NOVEMBER 9-11
2015 Asia Pacific Unconventional Resources Conference & Exhibition, Brisbane, Australia
www.spe.org/events/urce/2015/

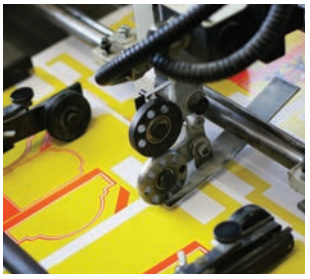
NOVEMBER 9-11
International Conference on Complex Systems Engineering, Storrs, CT
iccse.uconn.edu

NOVEMBER 9-12
Sulphur International Conference & Exhibition 2015, Toronto, ON
www.crugroup.com/Events/Sulphur

NOVEMBER 10
2nd Energy Efficiency in Shipping 2015, London, UK
www.recunnect.com

NOVEMBER 13-15
ESSCO-PEO Student Conference, Ottawa, ON
www.essco.ca

NOVEMBER 13-15
International Conference on Nanostructured Polymeric Materials & Polymer Nanocomposites, Kottayam, Kerala, India
www.nanomaterials.macromol.in



NOVEMBER 13-19
International Mechanical Engineering Congress & Expo, Houston, TX
www.asmeconferences.org/imece2015

NOVEMBER 16-17
Oil & Gas Chemistry 2015, Houston, TX
www.macroproworks.org

NOVEMBER 30-DECEMBER 1
2015 International Conference on Computer, Robotics and Manufacturing Technologies, Istanbul, Turkey
iaetr.org

NOVEMBER 30-DECEMBER 4
International Conference on Power Engineering, Yokohama, Japan
www.jsme.or.jp/pes/ICOPE-15

DECEMBER 2015

DECEMBER 1-3
ASME Gas Turbine India Conference, Hyderabad, India
www.asmeconferences.org/GTINDIA2015

DECEMBER 1-4
ARFTG 86th Microwave Measurement Conference, Atlanta, GA
www.arftg.org

DECEMBER 1-4
IEEE Real-Time Systems Symposium, San Antonio, TX
2015.rtss.org

DECEMBER 2-4
Construct Canada, Toronto, ON
www.constructcanada.com

DECEMBER 15-16
Minerals & Metals Production from Mine to Market, Cambridge, UK
www.iom3.org

JANUARY 2016

JANUARY 2-3
International Conference on Urban Planning, Transport and Construction Engineering, Pattaya, Thailand
icuptce.urcae.org

JANUARY 25-28
Mineral Exploration Roundup, Vancouver, BC
amebc.ca/roundup

Professional Engineers
Ontario

2016 COUNCIL ELECTIONS CALL FOR CANDIDATES

All PEO members are invited to become candidates for the positions of **president-elect, vice president, councillor-at-large** and **regional councillor** (one for each of PEO's five regions) on PEO council.

1. Any member may be nominated for election to council as **president-elect, vice president** or **councillor-at-large,** by at least 15 other members. The nomination must include at least one member resident in each region. [Regulation 941/90, s. 14(1)]
   (a) The position of **president-elect** is for a one-year term, after which the incumbent will serve a one-year term as president and a one-year term as past president.
   (b) The position of **vice president** is for a one-year term.
   (c) The **councillor-at-large** position is for a two-year term. One councillor-at-large is to be elected in 2016.

2. Any member residing in a region may be nominated for election to council as a **regional councillor** for that region by at least 15 other members who reside in the region. [Regulation 941/90, s.14(2) and s. 15.1(2)]
   (a) The position of **regional councillor** is for a two-year term.

A member nominated for election to council must complete a nomination acceptance form that states he or she is a Canadian citizen or has the status of a permanent resident of Canada and is a resident in Ontario. [Section 3(3) of the *Professional Engineers Act*] and consents to the nomination [Regulation 941/90, s. 15].

Nomination petitions for collection of nominators' signatures and nomination acceptance forms may be obtained from the PEO website at www.peo.on.ca, or Ralph Martin, PEO, 40 Sheppard Avenue West, Suite 101, Toronto ON M2N 6K9. Email: rmartin@peo.on.ca; Tel: 416-840-1115; 800-339-3716, ext. 1115.

Completed nomination petitions and nomination acceptance forms are to be sent only electronically and only to the chief elections officer, chiefelectionsofficer@peo.on.ca, by 4:00 p.m., December 4, 2015. No personal delivery of forms will be accepted.

For further information on becoming a candidate, please refer to the *2015 Council Elections Guide* posted on PEO's website.

2016 VOTING PROCEDURES

The 2016 voting and election publicity procedures were approved by the council of PEO in September 2016. Candidates are responsible for familiarizing themselves with these procedures. Any deviation could result in a nomination being considered invalid. Candidates are urged to submit nominations and election material well in advance of published deadlines so that irregularities may be corrected before the established deadlines. Nominees' names are made available as received; all other election material is considered confidential until published by PEO.

1. The schedule for the elections to the 2015-2016 council is as follows:

Date nominations open	October 26, 2015
Date nominations close	4:00 p.m., December 4, 2015
Date PEO's membership roster will be closed for the purposes of members' eligible to automatically receive election material[1]	January 13, 2016
Date a list of candidates, their statements and voting instructions will be mailed to members	no later than January 22, 2016
Date voting will commence	on the date that the voting packages are mailed to members, no later than January 23, 2016
Date voting closes	4:00 p.m., February 26, 2016

Note: All times noted in these procedures are Eastern Time.

[1]Members licensed after this date may call in and request that election information be sent to them.

2. Candidates' names will be listed in alphabetical sequence by position on the list of candidates sent to members and on PEO's website. However, the order of their names will be randomized when voters sign in to the voting site to vote.
3. A person may be nominated for only one position.
4. Nomination papers are to be submitted only by email (chiefelectionsofficer@peo.on.ca) for tracking purposes. Forms will not be accepted in any other format (e.g. fax, personal delivery, courier, regular mail).
5. Only nomination acceptance and petition forms completed in all respects, without amendment in any way whatsoever, will be accepted.
6. Signatures on nomination papers do not serve as confirmation that a member is formally endorsing a candidate.
7. Candidates will be advised when a member of the Central Election and Search Committee has declared a conflict of interest should an issue arise that requires the consideration of the committee.
8. An independent agency has been appointed by council to receive, control, process and report on all cast ballots. This "official elections agent" will be identified to the members with the voting material.

9. If the official elections agent is notified that an elector has not received a complete election information package, the official elections agent shall verify the identity of the elector and may either provide a complete duplicate election information package to the elector, which is to be marked "duplicate," by regular mail or email or provide the voter's unique control number to the voter and offer assistance via telephone. In order to receive such information via email, the elector must provide prior written consent to the use of his or her email address for this purpose.
10. Council has appointed a Central Election and Search Committee to:
    - encourage members to seek nomination for election to the council as president-elect, vice president or a councillor-at-large;
    - assist the chief elections officer as may be required by him or her;
    - receive and respond to complaints regarding the procedures for nominating, electing and voting for members to the council;
    - conduct an annual review of the elections process and report to the September 2016 council meeting.
11. Council has appointed a Regional Election and Search Committee for each region to:
    - encourage members residing in each region to seek nomination for election to the council as a regional councillor.
12. Candidates for PEO council may submit expense claims, to a maximum of $1000 for travel to chapter events during the period from the close of nominations to the close of voting. Such travel expenses are only reimbursed in accordance with PEO's expense policy.
13. Council has appointed an independent chief elections officer to oversee the election process and to ensure that the nomination, election and voting are conducted in accordance with the procedures approved by council.
14. The chief elections officer will be available to answer questions and complaints regarding the procedures for nominating, electing and voting for members to the council. Any such complaints or matters that the chief elections officer cannot resolve will be forwarded by the chief elections officer to the Central Election and Search Committee for final resolution. Staff is explicitly prohibited from handling and resolving complaints and questions, other than for administrative purposes (e.g. forwarding a received complaint or question to the chief elections officer).
15. On or before the close of nominations on December 4, 2015, the president will appoint three members or councillors who are not running in the election as returning officers to:
    - approve the final count of ballots;
    - make any investigation and inquiry as they consider necessary or desirable for the purpose of ensuring the integrity of the counting of the vote; and
    - report the results of the vote to the registrar not later than March 11, 2016.
16. Returning officers shall receive a per diem of $250 plus reasonable expenses to exercise the duties outlined above.
17. Nomination papers are to be submitted only by email for tracking purposes. Forms will not be accepted by any other format (e.g. personal delivery, courier, fax or regular mail).
18. If a candidate withdraws his or her nomination for election to PEO council prior to the preparation of the voting site, the chief elections officer shall not place the candidate's name on the voting site of the official elections agent or on the list of candidates sent to members and shall communicate to members that the candidate has withdrawn from the election. If the candidate withdraws from the election after the electronic voting site has been prepared, the chief elections officer will instruct the official elections agent to adjust the voting site to reflect the candidate's withdrawal.
19. Voting will be by electronic means only (Internet and telephone).
20. All voting instructions, a list of candidates and their election publicity material will be sent to members. All voters will be provided with detailed voting instructions on how to vote electronically. Control numbers or other access control systems will be sent to members by email after the election package has been sent out.
21. Verification of eligibility, validity, or entitlement of all votes received will be required by the official elections agent. Verification by the official elections agent will be by unique control number to be provided to voters with detailed instructions on how to vote by the Internet and by telephone.
22. The official elections agent shall keep a running total of the electronic ballot count and shall make the results available to the candidates through a secure website not before the close of the voting period and not later than 9:00 p.m. on February 26, 2016. All candidates will be provided with a unique control number giving them access to the secure website of the official elections agent.
23. Voters need not vote in each category to make the vote valid.
24. There shall be an automatic recount of the ballots for a given candidate category for election to council or bylaw confirmation where the vote total on any candidate category for election to council between the candidate receiving the highest number of votes cast and the candidate receiving the next highest number of votes cast is 25 votes or fewer for that candidate category or where the votes cast between confirming the bylaw and rejecting the bylaw is 25 votes or fewer.
25. Reporting of the final vote counts, including ballots cast for candidates who may have withdrawn their candidacy after the opening of voting, to PEO will be done by the returning officers to the registrar, who will

advise the candidates and council in writing at the earliest opportunity.

26. Certification of all data will be done by the official elections agent.
27. The official elections agent shall not disclose individual voter preferences.
28. Upon the direction of the council following receipt of the election results, the official elections agent will be instructed to remove the electronic voting sites from its records.
29. Election envelopes that are returned to PEO as undeliverable are to remain unopened and stored in a locked cabinet in the Document Management Centre (DMC) without contacting the member until such time as the election results are finalized and no longer in dispute.
30. Elections staff shall respond to any requests for new packages as usual (i.e. If the member advises that he/she has moved and has not received a package, the member is to be directed to the appropriate section on the PEO website where the member may update his/her information with DMC).
31. DMC staff shall advise elections staff when the member information has been updated; only then shall the elections staff request the official elections agent to issue a replacement package with the same control number.
32. Elections staff are not to have access to, or control of, returned envelopes.
33. After the election results are finalized and no longer in dispute, the chief elections officer shall authorize the DMC to unlock the cabinet containing the unopened returned ballot envelopes so that it may contact members in an effort to obtain current information.
34. After the DMC has determined that it has contacted as many members whose envelopes were returned as possible to obtain current information or determine that no further action can be taken to obtain this information, it shall notify the elections staff accordingly and destroy the returned elections envelopes.
35. Nothing in the foregoing will prevent additions and/or modifications to procedures for a particular election if approved by council.
36. The election publicity procedures form part of these voting procedures.
37. All questions from, and replies to, candidates are to be addressed to the chief elections officer:
    By email: chiefelectionsofficer@peo.on.ca;
    By letter mail: Chief Elections Officer
    c/o Professional Engineers Ontario
    101–40 Sheppard Avenue West
    Toronto, ON M2N 6K9.

2016 ELECTION PUBLICITY PROCEDURES

IMPORTANT DATES TO REMEMBER

Deadline for receipt of publicity materials for publication in *Engineering Dimensions* and on PEO's website, including URLs to candidates' own websites	4:00 p.m., December 11, 2015
Deadline for submission of material for eblasts of candidate material to members	1. January 14, 2016–1st eblast 2. January 28, 2016–2nd eblast 3. February 11, 2016–3rd eblast
Dates of eblasts to members	1. January 21, 2016 2. February 4, 2016 3. February 18, 2016
Date of posting period	January 2016 to February 29, 2016
Dates of voting period	January 23, 2016 to 4:00 p.m., February 26, 2016

Note: All times indicated in these procedures are Eastern Time.

1. Names of nominated candidates will be published to PEO's website as soon as their nomination is verified.
2. Names of all nominated candidates will be forwarded to members of council, chapter chairs and committee chairs, and published on PEO's website, by December 7, 2015.
3. Candidates will have complete control over the content of all their campaign material, including material for publication in *Engineering Dimensions*, on PEO's website, and on their own websites. Candidates are reminded that it is readily available to the public and should be in keeping with the dignity of the profession at all times. Material for publishing purposes will be published with a disclaimer. The chief elections officer may seek a legal opinion if the chief elections officer believes campaign material could be deemed libelous and has the authority to remove the campaign material if so advised by legal counsel.
4. Candidate material may contain personal endorsements provided there is a clear disclaimer indicating that the endorsements are personal and do not reflect or represent the endorsement of PEO council, a PEO chapter or committee, or any organization with which an individual providing an endorsement is affiliated.
5. Candidates will have discretion over the presentation of their material for publishing purposes, including but not limited to font style, size and effects, and are allocated the equivalent of one-half page each in *Engineering Dimensions* (6.531 inches wide x 4.125 inches in height) in which to provide their election material. A template for this purpose is available at www.peo.on.ca.
6. Candidates will be permitted to include a photograph within their one-half page.
7. All material for publishing on PEO's website and in *Engineering Dimensions* must be submitted to the chief elections officer at chiefelectionsofficer@peo.on.ca in accordance with Schedule A attached. Candidates shall not use the PEO logo in their election material.
8. Candidates' material for publication in *Engineering Dimensions* and on the website, including URLs to candidates' own websites, must be forwarded to the chief elections officer at the association's offices or via email at chiefelectionsofficer@peo.on.ca no later than December 10, 2015 at 4:00 p.m. and in accordance with Schedule A attached. Candidate material will be considered confidential, and will be restricted to staff members required to arrange for publication, until published on

PEO's website. Material will be published for all candidates on PEO's website at the same time.

9. If campaign material is submitted by a candidate without identifying information (i.e. name or glaring omission) PEO staff are authorized to contact the candidate and ask if he/she wishes to resubmit material. If campaign material is received by the chief elections officer and returned to the candidate for amendment in order to comply with the election publicity procedures, and the amended material is not returned within the time prescribed, staff will publish the material with a notation explaining any necessary redaction.
10. Candidate publicity material will be published as a separate insert/section in the January/February 2016 issue of *Engineering Dimensions* and to PEO's website in January 2016 and in the mailing sent to eligible voters with voting instructions.
11. Candidates may utilize space on PEO's website, provided they email their material to the chief elections officer in the format set out in Schedule A. This material must be received by the chief elections officer no later than December 10, 2015.
12. Candidates may submit updates to their material on PEO's website once during the posting period. Any amendments to a candidate's name/designations are to be considered part of the one-time update permitted to their posting during the posting period. Candidates may include links to PEO publications but *not* a URL link to a third party in their material that is to be posted on PEO's website. Links to PEO publications are not considered to be to a third party. For clarity, the only URL link that may be included in a candidate's material on PEO's website is the URL to the candidate's own website.
13. Candidates may post more comprehensive material on their own websites, to which a link will be provided from PEO's website during the posting period. Candidates may include a URL to third parties only in their own website material–not in material that will appear in *Engineering Dimensions*, not in material that is posted on PEO's election site (which includes the 1000-word space they are permitted), nor in eblast material.
14. PEO will provide three group email distributions to members of candidate publicity material beyond publication in *Engineering Dimensions*. Material must be submitted to the chief elections officer at chiefelectionsofficer@peo.on.ca in accordance with Schedule A.
15. Candidates are responsible for responding to replies or questions generated by their email message.
16. The chief elections officer is responsible for ensuring that all candidate material (whether for *Engineering Dimensions*, PEO's website, or eblasts) complies with these procedures. Where it is deemed the material does not satisfy these procedures, the chief elections officer will, within three full business days from receipt of the material by the association, notify the candidate or an appointed alternate, who is expected to be available during this period by telephone or email. The candidate or appointed alternate will have a further three full business days to advise the chief elections officer of the amendment. The candidate is ultimately responsible for meeting this deadline. Should the candidate fail to resubmit the material within the three business day period, their material will be published with a notation explaining any necessary redaction.
17. Candidates must attend all candidates meetings in person or by telephone in order to participate. Candidates may not be represented by proxy. Prepared statements will not be permitted and the moderator cannot read a statement from a candidate who does not attend the meeting in person or by telephone.
18. PEO will provide candidates with the opportunity to participate in all candidates meetings, which will be held at PEO offices and which will be video recorded for posting on PEO's website. On the day of the first all candidates meeting, an eblast will be sent to members announcing that all such video recordings will be posted to the PEO website within two business days of each meeting.
19. Caution is to be exercised in determining the content of issues of membership publications published during the voting period, including chapter newsletters. Editors are to ensure that no election candidate is given additional publicity or opportunities to express viewpoints in issues of membership publications distributed during the voting period from January 23, 2016 until the close of voting on February 26, 2016 beyond his/her candidate material published in the January/February issue of *Engineering Dimensions*, and on the PEO website. This includes photos (with or without captions), references to, or quotes or commentary by, candidates in articles, letters to the editor, and opinion pieces. PEO's communications vehicles should be, and should be seen to be, nonpartisan. The above does not preclude a PEO publication from including photos of candidates taken during normal PEO activities, e.g. licensing ceremonies, school activities, GLP events, etc., provided there is no expression of viewpoints. For greater clarity, no election-specific or election-related articles, including letters to the editor and president's message, are to be included in *Engineering Dimensions* during the voting period. Nothwithstanding the foregoing, *Engineering Dimensions* may contain an article on why voting is important.
20. Chapters may not endorse candidates, nor expressly *not* endorse candidates, in print, on their websites or through their list servers, or at their membership meetings or activities during the voting period. Where material does not comply with these procedures, the chief elections officer will cause the offending material to be removed if agreement cannot be reached with the chapter within the time available.
21. Candidates may attend chapter annual general meetings and present their material and network during the informal portion of the meeting, provided they have obtained the prior consent of the chapter executive. If a chapter executive provides or withholds consent, it

must provide or withhold consent to all candidates equally and fairly.

22. While not prohibited, use of candidates' mass mailings (either by post or electronic means) for campaign purposes, other than the email blasts that are sent by PEO on behalf of the candidates, will not be condoned by PEO.
23. The Central Election and Search Committee is authorized to interpret the candidate guidelines and procedures, and to rule on questions and concerns of the candidates on matters around the election process.
24. These election and publicity procedures form part of the voting procedures.

SCHEDULE A: 2016 ELECTION PUBLICITY PROCEDURES

SPECIFICATIONS FOR CANDIDATE MATERIALS

Publication format (in *Engineering Dimensions* or PEO website)	All material for publication in *Engineering Dimensions* must fit into the template provided at www.peo.on.ca. The template dimensions are 6.531 inches wide and 4.125 inches in height. All material for publication must be submitted as a PDF document with images in place for reference, and as a formatted Word file, or in a Word-compatible file, showing where photographs are to be placed. Candidates shall not use the PEO logo in their election material. Candidate material may contain personal endorsements provided there is a clear disclaimer indicating that the endorsements are personal and do not reflect or represent the endorsement of PEO council, a PEO chapter or committee, or any organization with which an individual providing an endorsement is affiliated. The publications staff needs both a PDF file and a Word file of candidate material. This allows them to know how candidates intend their material to look. If there are no difficulties with the material, they will work simply with the PDF file. The Word file is required in case something isn't correct with the submission (just a bit off on the measurement, for example), as it will enable publications staff to fix the problem.
Photographs	Photographs must be at least 5" x 7" in size if submitted in hard copy form so that they are suitable for scanning ("snapshots" or passport photographs are not suitable.) If submitted in digital form, they must be JPEG-format files of at least 300 KB but no more than 2MB. Candidates can submit a digital photo at the specifications noted, or hard copy as noted, and preferably both. In case the digital file is corrupted or not saved at a sufficiently high resolution, publications staff can rescan the photo (hard copy) to ensure it prints correctly, as indicated on the PDF.
PEO website	Candidates may also utilize space on PEO's website by submitting a Word or Word-compatible file of no more than 1000 words, and no more than three non-animated graphics in JPEG or GIF format. Graphics may not contain embedded material. Candidates may post additional material on their own websites, to which a link will be provided from PEO's website. URLs for candidates' websites must be active by December 10, 2015. Candidates may include links to PEO publications but *not* a URL link to a third party in their material that is to be posted on PEO's website. Links to PEO publications are not considered to be to a third party. For clarity, the only URL link that may be included in a candidate's material on PEO's website is the URL to the candidate's own website.
Deadline for *Engineering Dimensions* and website submissions	Candidates' material for publication in *Engineering Dimensions* and on PEO's website must be forwarded to the chief elections officer at (chiefelectionsofficer@peo.on.ca) by December 10, 2015 at 4:00 p.m.
Eblast material	Candidates are permitted a maximum of 300 words for email messages. Materials are to be provided in text format only; graphics are not permitted. For clarity, a "graphic" is an image that is either drawn or captured by a camera. If HTML format is to be used for email messages, special design and graphic co-ordination are the candidate's responsibility.
Deadline for eblasts to members	Candidates' material to eblast to members must be forwarded to the chief elections officer at (chiefelectionsofficer@peo.on.ca): By January 14–for eblast on January 21 By January 28–for eblast on February 4 By February 11–for eblast on February 18
Help	Candidates should contact the chief elections officer (chiefelectionsofficer@peo.on.ca) if they have questions about requirements for publicity materials.

Professional Engineers Ontario

MINUTES OF THE 93RD ANNUAL BUSINESS MEETING

SATURDAY, APRIL 25, 2015

CHAIR: J. DAVID ADAMS, P.ENG., MBA, FEC

THE 93RD ANNUAL GENERAL MEETING (AGM) of Professional Engineers Ontario was held at the Westin Harbour Castle Hotel, Toronto, Ontario, on Saturday, April 25, 2015.

President J. David Adams advised that PEO was webcasting its business meeting to increase the accessibility of PEO information to more members, no matter where they are located.

The President thanked the participants and attendees of Friday's Volunteer Leadership Conference, which brought together both chapter and committee volunteers. He noted that, in addition to this conference, tribute was paid at the 2015 Order of Honour gala to eight exceptional professional engineers, as well as the Sterling Award recipient, each of whom had made significant, lifetime contributions to the engineering profession in Ontario.

He also acknowledged the AGM Gold Sponsor, The Personal, and thanked the company for its continued support of the engineering profession.

The President announced that following the business meeting would be the keynote luncheon with speaker Peter Doody, who served as Senior Commission Counsel at the Elliot Lake Commission of Inquiry.

The President informed the meeting that the 500th meeting of PEO Council would be held following the business meeting and luncheon and that all were welcome to attend.

CALL TO ORDER

The President advised that since proper notice for the meeting had been published in *Engineering Dimensions*, as provided for under section 20(i) of By-Law No. 1, and a quorum was present, the meeting was officially called to order.

IN MEMORIAM

The President asked all present to stand for a moment of silence in remembrance of those PEO members who had passed away in 2014.

REMARKS FROM PRESIDENT ADAMS

President Adams advised that he would like to see the membership more involved in decision making, noting that a good start was made in this direction at the April 24, 2015 Volunteer Leadership Conference by bringing the chapters and committees together to discuss various issues. He stated that he hopes incoming President Chong will continue to involve the membership in this manner.

Calling himself very member-oriented, President Adams said he felt this approach should continue in regard to several important issues for which Council will continue to seek solutions. He said the most recent issue involves a new policy of Citizenship and Immigration Canada, which believes that Canada will need a large number of technically trained immigrants over the next few years, due to the pending retirements of many engineers and technologists. He said he knows that this will not be an immediate issue because the labour market study conducted by the Ontario Society of Professional Engineers (OSPE) shows that there is a surplus. He said he believes there are currently many underemployed and unemployed engineers, because of the 6000 engineering students graduating from 15 universities in Ontario each year.

President Adams indicated that Engineers Canada intends to become part of the fast-track government immigration process by performing a preliminary assessment of the credentials of potential immigrants, which he wrote about in *Engineering Dimensions*. Engineers Canada hopes to do this initial assessment while immigrants are still residing in their native countries.

President Adams said the final academic and experience assessments for licensure, however, would be made by PEO through the Academic Requirements and Experience Requirements committees. He said PEO Council recently voted not to get involved with the federal government immigration issue, partly because of the experience when a similar program was in place a little over 10 years ago and immigrants thought the assessments by Engineers Canada meant they could get a licence without going any further. President Adams said he had been assured by Kim Allen, P.Eng., FEC, CEO, Engineers Canada, that the future assessments would make clear that the assessment was not for licensure purposes and that applicants would be required to pass the requirements set by the provincial regulatory bodies legislated to do this very job.

President Adams then provided an update on the progress on implementing the Aptify database software that is to be used in licensing, financial accounting and other core aspects of PEO's business. He advised

that the implementation of Aptify is behind schedule and that, to date, $1.3 million had been spent on the purchase and installation of Phase 1 of the project, which represents an overrun of $135,000 to the initial budget of $1.16 million approved by Council on February 8, 2013. He said that to provide funds to complete Phase 1, the Registrar had proposed that two approved projects be postponed, one being Aptify Phase II, which obviously cannot proceed until the completion of Phase I, the other being a relaunch of the SharePoint software.

President Adams said another issue that has suffered delay is proclamation of the repeal of the industrial exception, despite intensive lobbying and a costly program on PEO's part. He noted that the exception, which allows companies to design production and process equipment and machinery for their own use without professional engineering input, was introduced in 1984. He also noted that, at present, a pre-start program that requires supervision and approval of implementation of new lines and new machines by an engineer is in place, but that people are still being hurt in factories. He said no other province has a similar exception in its engineering act. He said PEO would continue to collect industrial injury statistics and would petition to government accordingly.

President Adams stated that while he generally supports the Government Liasion Program (GLP), had PEO divested from advocacy to follow the government's directive 12 years ago, PEO could have applied these funds to other projects. The President said the GLP was budgeted for $245,600 in 2014, of which only $34,000 was clearly earmarked for regulatory matters. He said he would welcome comments from members about this.

President Adams then discussed Elliot Lake, noting that Ontario engineers suffered the greatest loss in reputation in many years over the Algo Centre Mall roof collapse. He noted that the Elliot Lake Commission of Inquiry did not adopt the engineering construction control protocol developed by British Columbia almost 35 years ago when a mall roof collapsed in Burnaby, although it was advised of the protocol. He noted that the partial collapse of the rooftop parking deck of the Algo Centre Mall, a 30-year-old building, was due to corrosion caused by salt.

The President said the Commission of Inquiry did recommend certain improvements, including a new performance standard for structural inspections of existing buildings with a mandate that a P.Eng. produce a structural adequacy report for existing buildings. He said PEO has been asked to release information on practitioners that have been disqualified and to institute a plan for continuing professional development. He noted that some positive strides on the latter had been made at the Volunteer Leadership Conference, where members proposed some excellent ideas. He said that, in his opinion, members should be involved in decision making regarding continuing education.

President Adams discussed employment. He said he would like PEO to concentrate on new technology by having the 15 universities that offer engineering programs and PEO unite in discussion with the Emerging Disciplines Task Force regarding new fields of engineering to develop the qualifications required to participate in them. He also noted that he had explored India's request for Canadian engineers to renew their infrastructure, adding that Indian Prime Minister Narendra Modi had recently been in Canada and is very interested in this.

President Adams concluded his remarks by discussing Toronto's decaying infrastructure, saying that, in his opinion, PEO should make it known that it is willing to help and funnel knowledge into solutions. He stated that he had recently sent a letter to the Right Honourable Stephen Harper, Premier Kathleen Wynne and Mayor John Tory outlining some of the problems in Toronto. He suggested that when members encounter infrastructure problems in their areas, they should report them to the proper authorities.

INTRODUCTION OF COUNCIL

The President introduced the members of the 2014-2015 PEO Council.

The Executive Committee members: Annette Bergeron, P.Eng., FEC, Past President; Thomas Chong, P.Eng., FEC, President-elect; George Comrie, P.Eng., FEC, Vice President (elected); Michael Wesa, P.Eng., Vice President (appointed); and Councillors Nicholas Colucci, P.Eng., FEC, Rob Willson, P.Eng., Rebecca Huang, LLB, and himself as chair.

The remaining members of Council: Councillors-at-Large Roydon Fraser, PhD, P.Eng., Roger Jones, BSc, P.Eng., and Bob Dony, PhD, P.Eng., FEC; and Regional Councillors Michael Wesa and Serge Robert, P.Eng. (Northern Region), Charles Kidd, P.Eng., and David Brown, P.Eng., BDS, C.E.T. (Eastern Region), Changiz Sadr, P.Eng., FEC, and Nicholas Colucci (East Central Region), Ewald Kuczera, MSc, P.Eng., and Len King, P.Eng., FEC (Western Region), and Rob Willson and Danny Chui, P.Eng., FEC (West Central Region); and Lieutenant Governor-in-Council Appointees Ishwar Bhatia, MEng, P.Eng., Santosh Gupta, PhD, P.Eng., FEC, Richard Hilton, P.Eng., Rebecca Huang, Bill Kossta, Mary Long-Irwin, Sharon Reid, C.Tech., Chris Roney, P.Eng., BDS, FEC, Rakesh Shreewastav, P.Eng., AVS, FEC and Marilyn Spink, P.Eng.

PEO's directors to Engineers Canada for 2014-2015: Diane Freeman, P.Eng., FEC, Annette Bergeron, George Comrie, Chris Roney and Rakesh Shreewastav. President Adams also acknowledged Registrar Gerard McDonald, P.Eng.

ORDER OF BUSINESS

President Adams welcomed the special guests attending the meeting and introduced representatives from provincial and national engineering associations from across the country:

- Digvir S. Jayas, FCAE, FEIC, FEC, P.Eng., President-elect, as well as Kim Allen,

P.Eng., FEC, Chief Executive Officer, Engineers Canada;
- Ann English, P.Eng., Chief Executive Officer and Registrar, Association of Professional Engineers and Geoscientists of British Columbia;
- Andrew Loken, P.Eng., FEC, President, and Dennis Paddock, P.Eng., FEC, Chief Executive Officer and Registrar, Association of Professional Engineers and Geoscientists of Saskatchewan;
- Marcia Friesen, P.Eng., Past President, Association of Professional Engineers and Geoscientists of Manitoba; and
- Anne Baril, Eng., Board Member, Ordre des ingénieurs du Québec.

He also welcomed representatives of PEO's partners in the engineering community in Ontario:
- Danny Young, P.Eng., President and Chair, and Sandro Perruzza, BSc, Chief Executive Officer, Ontario Society of Professional Engineers (OSPE);
- Nadine Miller, P.Eng., Board Secretary, Consulting Engineers of Ontario;
- Toon Dreessen, B.Arch, OAA, MRAIC, AIA, LEED AP, President, Ontario Association of Architects;
- Anna Godo, P.Eng., President, Municipal Engineers Association; and
- Liam Morrow, President, Engineering Student Societies' Council of Ontario.

Also welcomed were Bob van den Berg, C.E.T., President, and David Thomson, Chief Executive Officer, Ontario Association of Certified Engineering Technicians and Technologists (OACETT).

ADOPTION OF MINUTES

President Adams referred members to the minutes of the 2014 Annual General Meeting, which had been published in the November/December 2014 issue of *Engineering Dimensions* and had also been distributed at the meeting.

It was moved by Nicholas Colucci, P.Eng., seconded by Ewald Kuczera, P.Eng., that the minutes of the 2014 Annual General Meeting, as published in the November/December 2014 issue of *Engineering Dimensions* and as distributed at the meeting, be adopted.

Motion carried

BUSINESS ARISING FROM THE MINUTES

The President advised that normally actions taken by Council on submissions discussed at last year's Annual General Meeting would be reviewed; however, there were no submissions received last year.

FINANCIAL REPORT

The President referred members to the auditor's report and the financial statements, which were published to PEO's website prior to the meeting and distributed as part of the registration package for the meeting. The statements would also be published in the May/June 2015 issue of *Engineering Dimensions*.

He also referred to the booklet entitled *Questions and Answers on PEO Operations* included in the registration package, which he said was compiled to address common questions on all aspects of PEO's operations. He advised that the booklet had been published on the PEO website and that chapters may obtain additional printed copies by contacting their regional councillors.

The President then asked for questions from the floor regarding the financial statements. There were none.

It was moved by Thomas Chong, P.Eng., seconded by Roger Jones, P.Eng., that the financial statements, as presented, be received.

Motion carried

APPOINTMENT OF AUDITORS

President Adams stated that members must appoint auditors for the upcoming year. He advised that the Audit Committee was recommending the firm of Deloitte LLP be reappointed.

It was moved by Thomas Chong, P.Eng., seconded by Santosh Gupta, P.Eng., that the firm of Deloitte LLP be appointed auditors of the association for the 2015 financial year.

Motion carried

REGISTRAR'S REPORT

Registrar McDonald stated the work that had been done over the past year, as well as plans for the upcoming year beginning with recent organizational changes. He presented the new structure for his direct reports, which now includes Finance, IT and Communications in addition to Corporate Services, Licensing and Registration, Regulatory Compliance, and Tribunals and Regulatory Affairs. He said this was done to flatten out the organization and reduce layers between the working level and the Registrar to break down any communication barriers and silos within the organization. He said the goal is to create a more nimble organization to respond, for example, to some of the issues that were discussed at the previous day's Volunteer Leadership Conference in terms of providing members better service.

Registrar McDonald then briefly reviewed the recent Regulation 941 changes, which were approved by Cabinet. He noted that these changes are a culmination of an extensive body of work by PEO's Legislation Committee and staff to move the changes through. He noted that a

number of the changes stem from the 2010 changes to the *Professional Engineers Act* and bring these changes into effect, allowing PEO to proceed on a number of critical issues.

Some of the more significant changes relate to creating the licensed engineering technologist (LET) class of limited licence. This is an issue that PEO has been working on with colleagues at OACETT for some time with a lot of co-operation between the two organizations. He said other significant changes will allow limited licence holders to be responsible for engineering services to the public under a Certificate of Authorization. The Registrar noted that amendments that became effective on their filing include:

- requiring the Academic Requirements and Experience Requirements committees to specify the academic or experience requirements to be met, where either committee determines an applicant does not meet the requirements for licensure;
- changing the temporary licence requirements for when a collaborator is not necessary;
- requiring a P.Eng. PEO staff member to take a leave of absence if seeking election to PEO Council, and to resign from staff if elected;
- prohibiting a retiring Past President from running for the position of President-elect for one year after leaving the Past President position;
- updating regional boundaries to reflect road name changes;
- authorizing PEO's Registrar to send notices electronically to practitioners, and applicants to submit applications and supporting documents electronically; and
- making minor housekeeping changes to correct or clarify some previous wording.

He said amendments that would be effective on July 1, 2015 are:

- changing the requirements to obtain a limited licence;
- creating the LET class of limited licence;
- permitting limited licence holders to be responsible for the engineering services provided to the public under a PEO Certificate of Authorization; and
- setting out the academic requirements to be an engineering intern, as well as engineering interns' rights and privileges.

Registrar McDonald then discussed the Strategic Plan, advising that the launching of PEO's strategic planning process had been announced at the 2014 Annual General Meeting. He noted that one of his first priorities as Registrar was to facilitate a Strategic Plan and the 2014 Penta Forum had been used as the launching board for that initiative. Over the course of the next six to eight months, he said, there were numerous discussions with Council, chapters and committee chairs to formulate a plan. Registrar McDonald said he was happy to announce that in November 2014 Council had approved the Strategic Plan for the next three years, and noted a copy of the plan was included in the AGM delegate package. He called the plan the roadmap for the organization that outlines 24 strategic objectives and 98 specific strategies.

Over the next three years, he said, the outcomes of the strategies will be measured and adjusted as needed, in consultation with Council. He said Council has directed that the Registrar provide progress reports every four months, advising how the various initiatives are being achieved, with the first progress report included in the AGM delegate package. Future progress reports will be placed on PEO's website so any member can, whenever they wish, go to the Strategic Planning area of the website to check on progress.

The Registrar also noted that PEO will continue to consult its membership, even though the Strategic Plan is now complete, and that he has attended many chapter AGMs to discuss the plan and how chapters can become involved. He said he would be happy to present the Strategic Plan to any chapter making such a request, and that PEO welcomes feedback on any strategy. He said members may contact him to give feedback, any of the people identified as leads for the various projects, or their regional councillors.

In closing, Registrar McDonald noted that it had been a productive year and thanked Council for its co-operation and support, as well as PEO staff, which he called a very dedicated group of individuals whose role is to serve the members.

GREETINGS FROM ENGINEERS CANADA

The President invited Engineers Canada to provide an update.

Digvir Jayas, President-elect, thanked PEO for the invitation to attend the annual meeting. He expressed regrets on behalf of President Paul Amyotte, P.Eng., FEC, for not being able to attend. He said Engineers Canada exists to support the Canadian engineering regulatory bodies, including PEO, to advance the competence, integrity and public accountability of the engineering profession.

In working with, and for, its constituent association owners, he said, Engineers Canada recognizes the diligent work that each provincial and territorial regulator does to promote excellence within the profession, and to highlight issues of importance to engineers, and Engineers Canada has focused on better aligning the execution of its work with the goals of the regulatory bodies.

Jayas then highlighted a few of the things Engineers Canada has been working on in the interest of the constituent associations:

- On November 4, 2014, members of Engineers Canada's Bridging Government and Engineers Committee (BGE) met in Ottawa with parliamentarians from across the country to talk about Engineers

Canada's priorities. In total, they held meetings with 28 MPs, including meetings with parliamentary secretaries, chairs and vice-chairs of many House of Commons standing committees.

The team discussed themes in Engineers Canada's Pre-Budget Submissions, as well as the importance of having engineers involved in public policy and their role in protecting the public. BGE Committee members have meetings throughout the year with members of parliament across the country. Engineers Canada will continue to look for opportunities to work with the government on very important issues that affect the engineering profession or that the profession can play a role in;

- Through the efforts of Engineers Canada's Women in Engineering Committee, steady progress is being made toward Engineers Canada's 30 by 30 goal of having "30 per cent of newly licensed engineers be women by the year 2030." The Women in Engineering Committee has been tasked with a series of strategies and related goals to address barriers to the full participation of women in the profession; and
- The Framework for Regulation has undergone an internal review and is in the process of being streamlined. A component of the Framework is the Online Competency Assessment Project, which received federal funding of $779,000 on April 13. This project will be a fair, transparent, consistent and timely online solution for the assessment of engineering work experience, which will facilitate the use of the competencies for the engineering regulators and accelerate the licensing process for qualified foreign-trained engineers.

Engineers Canada will take the next few months to plan and set the project up for success, and will engage the constituent associations in the fall.

In addition, Engineers Canada is engaged in discussions with Citizenship and Immigration Canada about becoming the sole assessor of engineering credentials for immigration purposes, known as the Educational Credential Assessment. Engineers Canada would act as the clearing house, but engineering regulators would remain the sole assessors of applications for licensure.

The project would provide international engineering graduates with personalized information to help them with their decision to immigrate. It will provide regulators with authenticated, translated credentials for use during the licensure process.

The Educational Credential Assessment project would ensure that applicants are better informed about engineering in Canada and more likely to be ready to apply for a licence. Engineers Canada will continually update stakeholders on this process as it moves forward.

Jayas advised that he, or any of PEO's Engineers Canada Directors–Annette Bergeron, Chris Roney, Diane Freeman, Rakesh Shreewastav and George Comrie–would be available to answer any questions.

Jayas extended his best wishes to Thomas Chong on his incoming PEO presidency.

To wrap up, Jayas stated that Engineers Canada is proud to recognize members for noteworthy service to the engineering profession with fellowships. He congratulated all members who received their Engineers Canada fellowships earlier in the year. He also thanked the PEO executive and staff for their ongoing support of Engineers Canada and that he looked forward to continued collaboration between the associations.

UPDATE FROM THE ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

The President invited OSPE to provide an update.

Danny Young, P.Eng., President and Chair, expressed his appreciation for the invitation to attend the meeting, noting that his current term as OSPE's President and Chair, his third, would be ending soon. He stated that being involved with the organization from the start, approximately 14 years, he felt honoured to once again take on the leadership role and that he has enjoyed the opportunities to influence change on behalf of the profession, but that there is still a lot of work that's needed to be done.

He stated that PEO and OSPE are two organizations that share many common goals and, while their mandates are separate, both want to contribute to the profile and influence of the engineering profession. Both organizations must continue articulating the differences and interdependancies clearly, while working side by side. He indicated that he would like to take the opportunity to personally thank Registrar McDonald for working with OSPE and that together with OSPE's new CEO, Sandro Perruzza, great progress has been made. President Young said he looks forward to seeing the new leadership at both OSPE and PEO carry on the spirit of collaboration and mutual respect, going forward.

He noted that since the inception of OSPE in 2000, it has struggled to differentiate itself and has been challenged by the lack of a clear value proposition, but that he is pleased to announce that OSPE would be releasing a bold, five-year strategic plan at its Annual General Meeting on Tuesday, May 5, 2015. He said OSPE's strategic plan explains where the organization wants to go and how it will get there with specific short- and long-term goals. He said he believes this will be a big turnaround for the society, and that OSPE must engage the entire profession, including all disciplines of engineers and engineering professionals.

He said OSPE's inclusive plan will get more engineers talking to amplify the voice of the engineering profession, and that OSPE will work

to ensure that engineers are involved in government policy and planning discussions and are featured subject matter experts frequently in the media. He said OSPE will also aggressively promote the employment of engineers in the province, while preparing members for the future expectations and demands of industry by offering relevant and competitive professional development. He concluded by noting that OSPE now has an opportunity to move forward in a measured way thanks to the new strategic plan, and invited members to attend OSPE's Annual General Meeting on Tuesday, May 5, 2015 to get a better idea of where the organization is headed.

MEMBER SUBMISSIONS

President Adams stated that, as noted in section 17 of By-Law No. 1, PEO's Annual General Meeting is held:

- to lay before members reports of the association's Council and committees;
- to inform members of matters relating to the affairs of the association; and
- to ascertain the views of the members present on matters relating to the affairs of the association.

He noted that submissions presented to the AGM are a way for members in attendance to express their views on matters relating to the affairs of the association, and that a guidance document to assist members in making submissions to the AGM is available from the PEO website. Although member submissions are not binding on Council, he said, Council considers the issues raised at Annual General Meetings to be important and will address submissions expeditiously.

President Adams asked the proponent of the first submission to introduce the submission.

Moved by Denis Dixon, P.Eng., FEC, seconded by Andy Bowers, P.Eng., FEC:

WHEREAS PEO made a formal commitment to the Bélanger Commission at the Algo Mall Inquiry to update or replace the present form in which member information is maintained so as to provide an online searchable database of specific membership and other information for persons to whom licences have been issued;

AND WHEREAS almost two years from that commitment there is no such functionality evident on PEO's website;

AND WHEREAS almost two years from that commitment the existing website general purpose search function continues to return typically vast amounts of non-relevant information in response to most queries;

THEREFORE BE IT SUBMITTED THAT:

Council direct the Registrar to take all necessary actions to fully implement–either by using in-house IT capability or by out-sourcing–the searchable database functionality required to meet the commitment made to the Bélanger inquiry;

AND FURTHER THAT:

Council appoint one councillor to be responsible for working with the Registrar to monitor progress on database implementation and search functionality by demonstration, and report to Council and to the public on a monthly basis by posting update reports available to the public on the PEO website, identifying what specific progress has been made to realizing the overall promised functionality.

Motion defeated

President Adams asked the proponent of the second submission to introduce their motion.

Moved by Nancy Hill, P.Eng., seconded by Matthew Xie, P.Eng., FEC:

WHEREAS PEO has experienced a low level of member engagement as evidenced by poor voter turnout in elections for Council;

WHEREAS PEO is perceived to not be relevant to its membership, particularly the younger members as evidenced by poor participation in elections and at association events;

WHEREAS term limits help to foster an environment for recruitment to Council and for general activities of the association;

WHEREAS term limits force an organization to develop new leaders and provide a pool of committed people to renew the membership of committees; and

WHEREAS term limits create a sense of urgency, as well as opportunity for new people to join into the governance and leadership of the organization;

THEREFORE BE IT SUBMITTED THAT:

PEO institute term limits for all positions on Council for which an individual has already served and going forward will serve. Suggested term limits are:

President: one term,

Vice President: two terms,

Councillor-at-Large: three terms,

Regional Councillor: three terms,

Lieutenant Governor Appointees: two terms (to be proposed to the government).

Moved by Peter DeVita, P.Eng., FEC, seconded by Patrick Quinn, P.Eng., FEC:

That the main motion be amended to remove the suggested terms.

Amendment defeated

Members then voted on the main motion:

That PEO institute term limits for all positions on Council for which an individual has

already served and going forward will serve. Suggested term limits are:

President: one term,
Vice President: two terms,
Councillor-at-Large: three terms,
Regional Councillor: three terms,
Lieutenant Governor Appointees: two terms (to be proposed to the government).

Motion carried

President Adams asked the proponent of the third submission to introduce their motion.

Moved by Rob Willson, P.Eng., seconded by Sherry Draisey, P.Eng:

WHEREAS PEO employs an ad hoc system of encouraging members to run for Council positions, the Central Election and Search Committee's original mandate as a search committee having been downplayed in recent years and the Regional Election and Search Committees having had difficulty recruiting candidates;

WHEREAS in the recent election, four of five regional councillor positions were filled by acclamation (three by incumbents), both councillor-at-large positions were filled by incumbents, and former presidents of the association were elected to both officer positions (VP and President-elect);

WHEREAS PEO needs systems in place to ensure that the PEO electorate has a choice of new and effective candidates running for Council;

THEREFORE BE IT SUBMITTED THAT:

PEO institutes a system of identifying potential candidates for all Council positions well in advance of elections, operating in concert with term limits for all Council positions.

Motion carried

President Adams asked the proponent of the fourth submission to introduce their motion.

Moved by Patrick Quinn, P.Eng., seconded by Gregory Wowchuk, P.Eng:

WHEREAS PEO's spending has been growing at a rate far exceeding its membership growth rate;

WHEREAS there is concern that spending too often is not justified or prudent; and

WHEREAS there is continuing concern about the proper role and influence of government appointees (who comprise up to 41 per cent of our Council) on our Council;

THEREFORE BE IT SUBMITTED:

That future budgets be based on PEO's needs as a regulator, rather than on raising spending to match projected income.

Motion carried

That future budgets show distinct line items for government liaison, building capital improvement, and any expense exceeding $100,000 and that these particular items shall require a two-thirds majority at Council for their approval.

Motion defeated

That all major policy changes, such as a compulsory professional development program or practice specializations, shall require a two-thirds majority at Council and be subject to member consultation and ratification by referendum.

Motion defeated

President Adams asked the proponent of the fifth submission to introduce their motion.

Moved by Ray Linseman, P.Eng., seconded by Graham Walper, P.Eng.:

WHEREAS PEO Council has the authority to set PEO Policy;

WHEREAS under the *Privacy Act*, PEO is obligated to protect staff, volunteer and member personal information;

WHEREAS a member's home telephone number, home address and personal email address are generally accepted as personal information;

WHEREAS the chapter system was created over 50 years ago to improve communications between the members and Council;

WHEREAS a chapter member should have a right to be able to contact their chapter executive;

WHEREAS it is often beneficial to provide an email contact address for a chapter event;

WHEREAS one must remember to use the BCC option when copying other executive members on any replies of emails sent to the Chapter Webmail account to protect their privacy; and

WHEREAS the ability to reply to the sender is often lost when emails to the chapter email address are forwarded to other positions on the chapter executive such as the treasurer;

THEREFORE BE IT SUBMITTED THAT:

PEO Council establish a policy whereby any active member providing volunteer hours and service on a PEO Council-approved committee, a chapter executive or a chapter directorate would be allowed to request and be granted a PEO webmail account using the individual name or position with an @peo.on.ca identifier.

Motion carried

PRESENTATION TO OUTGOING COUNCILLORS

President Adams congratulated members of the 2014-2015 Council who had worked diligently to move the profession forward.

In recognition of their service, he presented certificates, name badges and desk plaques to retiring members of Council: Past President Annette Bergeron; Vice President (appointed) and Northern Region Councillor Michael Wesa; West Central Region Councillor Rob Willson and Lieutenant Governor-in-Council Appointee Chris Roney. He also recognized Lieutenant Governor-in-Council Appointee Martha Stauch, MEd, who had recently retired from Council.

INSTALLATION OF NEW PRESIDENT

Past President Adams administered the oath of office to Thomas Chong as President for the 2015-2016 term and presented him with the gavel of office. President Chong then thanked Adams on PEO's behalf for his service to the association.

INTRODUCTION OF INCOMING MEMBERS OF COUNCIL

President Chong then introduced the newly elected members of the 2015-2016 Council: Past President J. David Adams; President-elect George Comrie; Vice President Patrick J. Quinn, PhD (HC), P.Eng.; Councillors-at-Large Roydon Fraser and Roger Jones; Eastern Region Councillor Dave Brown; East Central Region Councillor Changiz Sadr; Northern Region Councillor Dan Preley, P.Eng.; West Central Region Councillor Warren Turnbull, P.Eng.; and Western Region Councillor Ewald Kuczera.

CLOSING REMARKS BY PRESIDENT CHONG

President Chong thanked everyone for making history with him, stating that when he ran for President he presented a platform to the membership for a President for the profession and for the members, which was supported by 60 per cent of those who voted. He thanked members for such an inspiring endorsement and called his election their victory. He indicated that he was aware the members did not do this just for him, but because they understand the enormity of the task that lies ahead. He said he is humbled by this opportunity and grateful for the overwhelming support and that he pledges to provide the leadership, vision and hard work expected of a President.

President Chong then shared his vision for the year ahead, of which there are three facets– Innovation, Recognition and Collaboration. He said that for some time the biggest issue facing PEO had been to find ways to increase the relevance and value of the P.Eng. licence and to provide value for members' hard-earned dollars. He said that as a chapter person for many years, he had heard of this need from chapter members, as well as rank-and-file members. He said he has always felt that licence holders should view the annual membership fee as an investment in engineering, not merely as paying a tax. For this investment to bear fruit, however, President Chong said he needs the help and participation of members. He said fresh, new voices are needed to bring a diversity of experiences and innovative ideas to Council, committees and chapters.

President Chong stated that as a practising engineer, he cares deeply about the profession and its obligation to protect the public interest. He said PEO's self-regulating model is made possible by the many individuals who possess a strong desire to improve the engineering profession, in particular the volunteers who serve on the task forces, committees and chapters, as well as the wonderful staff who work diligently to execute PEO's regulatory duties and help Council make informed decisions. President Chong also acknowledged the PEO Councillors sitting at the decision-making table, who sacrifice much to advance the profession.

President Chong stated that his father, now passed, had provided him with some very good advice, including a favourite saying, which was: "Son, you are either part of the problem or part of the solution." He noted that while strong leadership at PEO is needed, members also need to be part of the solution. To this end, he said, PEO had recently begun implementing an ambitious 2015-2017 strategic plan, which would determine the priorities for PEO operations and provide guidance for Council, committees, task forces and staff for the next three years. Through the Strategic Plan and to enhance the fiscal accountability of PEO, the annual budget would be aligned to meet the priorities of the organization and the organization would champion strategic collaborations with valued partners.

President Chong stated that PEO needs to do three things, one of which is to challenge PEO management to reduce costs and improve efficiency and operational effectiveness. The second is to enhance the self-regulatory function of the profession, which would cover a number of issues, such as precluding non-engineers from practising engineering, as well as developing more professional guidelines and standards and more effective enforcement activities. The third thing needed is to expand PEO's voluntary leadership base with a new communications strategy and engaging members with a shared vision of success.

In closing, President Chong thanked his wife of more than 30 years and his family for their support in giving him the time to achieve his dream and goal to serve the more than 80,000 licence and certificate holders as PEO President.

CONCLUSION

President Chong then declared the 93rd Annual General Meeting of the Association of Professional Engineers of Ontario concluded. Σ

Gerard McDonald, P.Eng.
Registrar

[ANNUAL INDEX]

The index consists of two parts: subject and author. Both are listed alphabetically, with the reference giving first the issue, then the page number, and finally the type of article. For example, checking under "building code" gives the reference, "A simple solution, **M/A**, 52, L." This indicates that in the March/April issue on page 52, there is a letter about the building code.

LEGEND

A—Awards
ABM—Annual business meeting
AGM—AGM minutes
AP—Awards Program
ED—Editor's Note
F—Features
FS—Financial statements
G—Gazette
GOV—Governance
IC—In Council
IM—In Memoriam
L—Letters
N—News
NEM—National Engineering Month
OH—Order of Honour
PE—Policy Engagement
PM—President's Message
PP—Professional Practice
R—Regulation
SB—Sidebar
V—Viewpoint

Subject Index

A

B

Author Index

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[PROFESSIONAL DIRECTORY]

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DEADLINE FOR MARCH/APRIL 2016 IS JANUARY 25, 2016.
DEADLINE FOR MAY/JUNE 2016 IS MARCH 25, 2016.

[LETTERS]

A COSTLY IMPACT

In reading the Gazette article on David Key's violation of the *Professional Engineers Act* (*Engineering Dimensions*, September/October 2015, p. 23), I was disappointed to see that he was only fined $10,000 for what could prove to be a more costly impact to the public as well as court resources. Perhaps this fine is set from an earlier time when that cost would have been seen as significant deterrence to the illegal use of the term.

However, in this case, I can barely see how a blatant disregard to our profession and the potential threat of such a small fine will prove to challenge those who may be tempted to violate the act in comparison to the potential gains.

Simon Weston, P.Eng., San Diego, CA

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

AD INDEX

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Association staff can provide information about PEO. For general inquiries, simply phone us at 416-224-1100 or 800-339-3716. Or, direct dial 416-840-EXT using the extensions below.

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