

NOVEMBER/DECEMBER 2020

ENGINEERING DIMENSIONS

REGULATION
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- 1 Canada Life and Health Insurance Association, "A guide to disability insurance," January 2016.
- 2 Parachute, "The Cost of Injury in Canada," 2015.
- 3 www.disabled-world.com, "Disability Insurance: Benefits, News and Claims," 2017.
- 4 Based on a percentage of your monthly earnings, while you are disabled and unable to perform your occupation.

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Description	Total cost (\$ Million)
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Fire/burns	366
Unintentional poisoning	1,264
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Violence	1,142
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ENGINEERING DIMENSIONS



FEATURE

30 PEO's BIG TENT: THE EMERGING DISCIPLINES CONUNDRUM

By Marika Bigongiari

SECTIONS

ASSOCIATION BUSINESS

- 5 Editor's Note
- 6 President's Message
- 8 CEO/Registrar's Report
- 26 Gazette
- 35 In Council
- 36 In Memoriam
- 38 Minutes of the 98th Annual Business Meeting

NEWS AND COMMENTARY

- 9 PEO adopts Notarius digital signature for member use; PEO reveals two-year Governance Roadmap workplan; Statistics Canada reports that engineering graduates are top earners across Canada; 30 by 30 Task Force engages with external stakeholders; Queen's engineering faculty begins diversity initiative for Black students in STEM; ESSCO executives meet challenges of a COVID-19 world head on; National engineering deans organization explores COVID-19 research; Annual ESSCO conference goes online
- 20 Bulletin Board
- 23 Profile: EIT successfully bridges school and career during turbulent times
- 25 Viewpoint: A blueprint for PEO's future
- 52 Letters

PROFESSIONAL ISSUES

- 21 Professional Practice: How to handle remote supervision of engineering site reviews

ADVERTISING FEATURES

- 51 Professional Directory
- 54 Ad Index



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ON THE COVER

- 9 PEO adopts digital signature for members
- 21 How to handle remote site reviews
- 38 Minutes of the 98th Annual Business Meeting

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If you suspect a person or company is practising engineering without a licence, contact PEO's enforcement hotline at 800-339-3716, ext. 1444, or by email at enforcement@peo.on.ca.



ONE STEP AT A TIME

By Nicole Axworthy



The first thing that comes to mind when I think of the future of regulation, our theme for this issue, is the regulation of disruptive technology in which engineers play a central role. It is a complex issue, and no one really knows where to even begin. Engineering regulators have been dealing with disruptive technology—and the new disciplines that grow from it—for decades. So, have we made any progress?

As technology advances, it's important to pause and consider the enormous responsibility of regulators to ensure public safety. Although the role of the innovator is to disrupt, the role of the regulator is to find the balance between innovation and social responsibility. One of the most well-known innovators of today, Tesla and SpaceX CEO Elon Musk, asserted earlier this year that the development of advanced artificial intelligence (AI), including AI created by his own companies, should be regulated. The question for regulators like PEO is when and how to go about it. In our feature article this issue, "PEO's big tent: The emerging disciplines conundrum" (p. 30), Associate Editor Marika Bigongiari speaks with engineers about this very issue. Most agree that although

regulation is necessary, the current system can't accommodate a bigger tent of responsibility. The number of emerging disciplines is growing exponentially, and this adds to the complexity of regulating them all. "Every time we invent something new, we create a new practice," Peter DeVita, P.Eng., FEC, chair of PEO's now-stood-down Emerging Disciplines Task Force, told Bigongiari. "And the problem is as you expand the scope wider and wider, it gets very difficult for a single regulating body to license the entire breadth of practice and do a good job."

Although emerging disciplines is a defining issue of the future, PEO is currently hard at work transforming its internal processes to become a stronger regulator. On page 10 you'll find out about the progressive plan for a two-year Governance Roadmap, which aims to guide governance reform, enhance PEO's regulatory and governance mandate and committee structures and improve governance effectiveness. This is in addition to several other improvement projects, including continuing to address the recommendations from PEO's external regulatory performance review through an action plan that was approved by Council last year.

I hope you enjoy the last issue of *Engineering Dimensions* for 2020. Although it's been a challenging year for all of us, I'm hopeful for a brighter future ahead. **e**

THIS ISSUE This is a century of exponential technological growth, and being able to define which new technologies fit neatly into the definition of professional engineering as defined by Ontario legislation is a challenge not only for PEO but also for those working in these new fields. In this issue, we explore why and how PEO might go about expanding its reach to include emerging disciplines.

REIMAGINING THE IDENTITY OF ENGINEERS IN A CHANGING WORLD

By Marisa Sterling, P.Eng., FEC



Engineering is a field of study and exploration that is constantly creating what has yet to exist. In 1922, when PEO was created, there were about nine engineering disciplines. Today, there are roughly 140 accredited engineering programs in over 50 engineering disciplines taught in Ontario—that means dozens of areas

of engineering education that meet PEO's academic requirements for the P.Eng. licence.

It is expected that engineering education will continue to innovate to develop the skills needed to help solve society's wicked problems like climate change and sustainability. As more engineering disciplines emerge, what brings us together to identify as engineers? Some may say it's the engineer's seal. That is likely the case for consulting engineers and those who produce drawings, but like so many others, my seal collected dust all the years I worked as a chemical engineer. Others might draw attention to the iron ring. And as much as the Ritual of the Calling of an Engineer imparts humility and a heightened consciousness of the social significance and high standard of engineering work, it is not a replacement for the licence. So, maybe it is the licence itself. After all, it caps off our engineering education, entitles us to call ourselves engineers and to independently practise professional engineering.

I was curious to find out how many Ontario engineering graduates in the roughly 140 undergraduate programs apply for and get a licence from PEO. Referencing the *Engineers Canada Engineering Enrolment and Degrees Awarded Report*, in 2014 there were 5996 undergraduate engineering degrees awarded in Ontario. Assuming it takes four to five years to collect the required work experience and complete the licence process, in 2019 PEO granted 1180 licences to Ontario gradu-

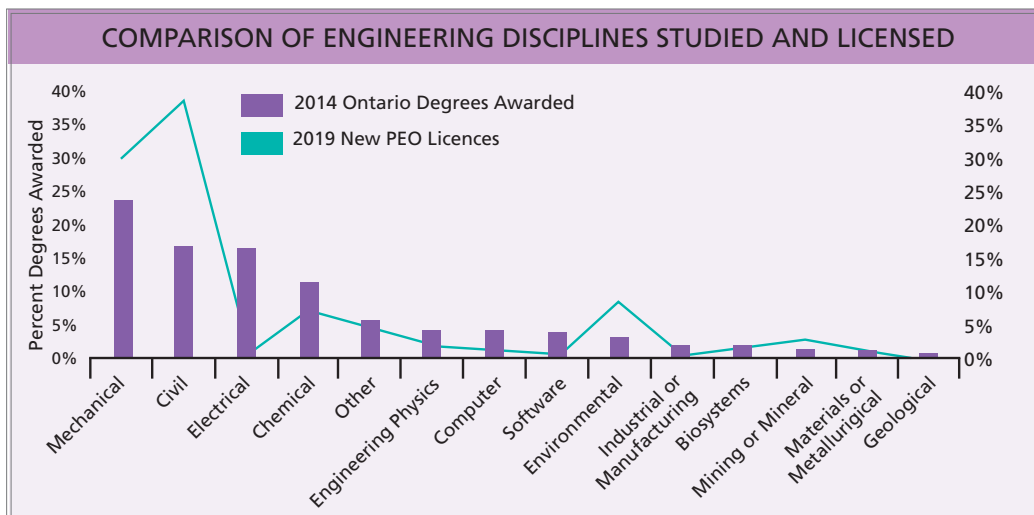
ates. A back-of-the-envelope calculation suggests that about 20 per cent of Ontario graduates get licensed by PEO. Examining this calculation with a gender lens, approximately 30 per cent of Ontario women graduates get licensed by PEO. Do these numbers suggest that women who complete an undergraduate engineering degree have a stronger engineering identity and sense of belonging to the engineering community?

Wanting to explore this question more, I examined the correlation of engineering graduates and licences by discipline. I found an overrepresentation of civil, mechanical, environmental and mining engineering in the disciplines licensed by PEO versus the rate they are studied in Ontario (see chart below). Do these numbers suggest that it is the engineering discipline that has a stronger correlation to an engineering identity, and that the newer disciplines like computer, software or biosystems engineering have yet to create a sense of belonging with the engineering community?

Further analysis will likely be needed to better understand the trends. But let's revisit those wicked problems that engineers have a role to play in protecting the public interest. These include the application of artificial intelligence in autonomous vehicles, cybersecurity, biotechnology and extreme weather. It will take multidisciplinary and integrated engineering teams working under the practice and ethical accountability of a licence to help ensure the well-being of the public is held paramount when solving these problems. In fact, the Ontario public ranks an engineer's high level of expertise, innovation and trust as the top three attributes. And the public expects engineers to solve infrastructure and environmental challenges and inspire innovations.

These public-interest reasons emphasize the importance that the rate of licensing keeps up with the innovations in engineering education and emerging technologies. If the challenge is one of a lack of an engineering identity across all

disciplines, then identity frameworks exist to inform how a person's sense of belonging is developed and what further role PEO may play in recognizing these engineering graduates. PEO's Student Membership Program and Engineering Intern Program are benchmarks to start from. If the challenge is in meeting the experience requirements, then PEO might reimagine the employment frameworks in collaboration with employers to help bridge this gap. [e](#)



REPENSER L'IDENTITÉ DES INGÉNIEURS DANS UN MONDE EN MUTATION

Par Marisa Sterling, P.Eng., FEC

L'ingénierie est un domaine d'étude et d'exploration qui crée constamment ce qui n'existe pas encore. En 1922, quand PEO fut créé, il y avait environ neuf domaines d'ingénierie. Aujourd'hui, il existe à peu près 140 programmes d'ingénierie accrédités dans plus de 50 disciplines d'ingénierie enseignées en Ontario, ce qui signifie que des douzaines de domaines de formation en ingénierie répondent aux exigences universitaires de PEO pour l'obtention de la licence d'ingénieur.

Il est à prévoir que l'enseignement de l'ingénierie continue d'innover pour développer les compétences nécessaires pour aider à résoudre les problèmes cruciaux sociétaux comme le changement climatique et la durabilité. Alors que plus de domaines d'ingénierie émergent, qu'est-ce qui nous rassemble pour nous identifier en tant qu'ingénieurs ? Certains diront que c'est le sceau de l'ingénieur. C'est probablement le cas pour les ingénieurs consultants et ceux qui produisent des dessins, mais comme tant d'autres, mon sceau a accumulé de la poussière pendant toutes les années où j'ai travaillé comme ingénieur chimiste. D'autres pourraient se concentrer sur l'anneau de fer. Et bien que le Rituel de l'appel d'un ingénieur confère l'humilité et une conscience accrue de la signification sociale et de la haute qualité du travail d'ingénieur, il ne remplace pas la licence. Donc, c'est peut-être la licence elle-même. Après tout, elle couronne notre formation d'ingénieur, nous donne le droit de nous appeler ingénieurs et d'exercer la profession d'ingénieur de manière indépendante.

J'étais curieuse de savoir combien de diplômés en ingénierie de l'Ontario dans les quelques 140 programmes de premier cycle demandent et obtiennent une licence de PEO. Selon le rapport *d'Ingénieurs Canada sur les inscriptions en ingénierie et les diplômes décernés*, en 2014, 5 996 diplômés de premier cycle en ingénierie ont été décernés en Ontario. En considérant qu'il faille quatre à cinq ans pour acquérir l'expérience professionnelle requise et mener à bien le processus d'obtention de la licence, en 2019, PEO a accordé 1 180 permis à des diplômés de l'Ontario. Un calcul, au dos de l'enveloppe, suggère qu'environ 20 % des diplômés de l'Ontario obtiennent une licence de PEO. En examinant ce calcul sous l'angle du genre, on constate qu'environ 30 % des diplômées ontariennes obtiennent une licence de PEO. Ces chiffres suggèrent-ils que les femmes qui obtiennent un diplôme d'ingénieur de premier cycle ont une identité d'ingénieure et un sentiment d'appartenance à la communauté des ingénieurs plus forts ?

Désireuse d'approfondir cette question, j'ai examiné la corrélation entre les diplômés en ingénierie et les licences par discipline. J'ai constaté une surreprésentation du génie civil, mécanique, environnemental et minier dans les disciplines accréditées par PEO par rapport au taux d'étude de

ces disciplines en Ontario (voir le tableau de la page 6). Ces chiffres suggèrent-ils que c'est la discipline de l'ingénierie qui a une plus forte corrélation avec une identité d'ingénieur et que les disciplines plus récentes comme l'ingénierie informatique, logicielle ou des biosystèmes n'ont pas encore créé un sentiment d'appartenance à la communauté des ingénieurs ?

Une analyse plus approfondie sera probablement nécessaire pour mieux comprendre les tendances. Mais revenons sur ces problèmes cruciaux voulant que les ingénieurs aient un rôle à jouer dans la protection de l'intérêt public. Il s'agit notamment de l'application de l'intelligence artificielle dans les véhicules autonomes, de la cyber-sécurité, de la biotechnologie et des conditions météorologiques extrêmes.

Il faudra des équipes d'ingénieurs multidisciplinaires et intégrées travaillant dans le cadre de la pratique et de la responsabilité éthique d'une licence pour aider à garantir que le bien-être du public est considéré comme primordial lors de la résolution de ces problèmes. En fait, le public ontarien classe le haut niveau d'expertise, d'innovation et de confiance d'un ingénieur parmi les trois principaux attributs. Et le public attend des ingénieurs qu'ils résolvent les problèmes d'infrastructure et d'environnement et qu'ils inspirent des innovations.

Ces raisons d'intérêt public soulignent l'importance que le taux d'octroi de licences corresponde aux innovations dans l'enseignement de l'ingénierie et les technologies émergentes. Si le défi consiste en l'absence d'une identité d'ingénieur dans toutes les disciplines, il existe alors des cadres d'identité qui permettent de savoir comment se développe le sentiment d'appartenance d'une personne et quel rôle supplémentaire PEO peut jouer dans la reconnaissance de ces diplômés en ingénierie. Le programme d'adhésion des étudiants et le programme d'ingénieur stagiaire de PEO sont des points de référence par où commencer. Si le défi consiste à satisfaire aux exigences en matière d'expérience, PEO pourrait alors ré-imaginer les cadres de l'emploi en collaboration avec les employeurs pour aider à combler cette lacune. **e**

EMBRACING SMALL STEPS

By Johnny Zuccon, P.Eng., FEC



By the time this message reaches you, PEO's physical headquarters will have been closed for eight months—something unimaginable as children and their parents were contemplating their March Break plans earlier this year. Recognizing the many professional and personal adversities we've all had to face during this time, I hope the

recent Thanksgiving long weekend provided some reassurance that we still have so much to be grateful for despite these uncertain and challenging times.

Since my last column, our province has seen an increase in the number of COVID-19 cases, prompting the Ontario government to introduce additional health and safety restrictions in targeted regions, including Toronto, where our headquarters are located. And while our office remains closed to visitors and the majority of our staff out of an abundance of caution, select employees have been permitted to return under controlled conditions to complete essential work requiring access to our facilities. In other cases, staff have been provided the resources necessary to continue to work virtually and, when required, workaround solutions have been developed for processes that had previously required in-office attendance to ensure PEO continues to meet all its obligations. For example, since adjusting our processes in mid-June to allow for licence applications to be received by email, approximately 2000 new applications were received between June and the end of August. Although this represents a decrease of 27 per cent from the same period (January to August) in 2019, evidence is promising that the decrease in volume may be made up by year's end. And, while the volume of licences approved is down 36 per cent compared to the same period last year, progress is being made to further reduce the backlog.

Meanwhile, our work is proceeding in developing a plan for a modified return to the office when appropriate. Our current property management firm, BGIS, has been retained following an RFP process to assist in this regard. They are developing a plan that includes making the building safe, occupying the building gradually, sustaining the environment, delivering projects safely and evolving the program. In the meantime, we have developed a return-to-work policy along with screening tools to assess and manage risk in order to provide a safe working environment for our employees.

CHANGE IN PROGRESS

During the pandemic, we continue to address the recommendations from our external regulatory performance review, albeit somewhat interrupted. The action plan approved by Council in September 2019 to initiate the significant changes necessary to enhance our legislative mandate remains our highest priority. Work on this front

includes finalizing the transition to the National Professional Practice Exam (NPPE), which has now completely replaced the PEO-administered Professional Practice Exam (PPE), with the final sitting of the latter held via remote proctoring on October 19 to 21. The NPPE is a computer-based, multiple-choice examination used by 10 of the provincial engineering regulatory bodies and is based on the same content and curriculum as the PPE. It provides PEO with an objective, psychometrically valid digital professional practice examination.

Progress is also being made on work related to our activity filter—the Council-approved tool to analyze the activities and responsibilities of all PEO committees, subcommittees and working groups in relation to PEO's regulatory obligations. The current phase (Phase 3) involves evaluating more than 90 committee activities and outputs in the four categories (core regulatory, regulatory policy, governance and neither) to determine if each activity and output is necessary in terms of both the legal basis for it (typically, in the act and/or the regulation) and their current assignment to a particular committee, task force or working group. This is likely to produce recommendations for Council to ensure that accountability (the next phase of the filter) for each activity in its current or modified form is clear and consistent with the developing governance model and regulatory objectives of Council.

Another important aspect of our transformation is our involvement to a more modern, digital infrastructure. Our initial efforts thus far have focused on technology initiatives necessary to continue our work during the pandemic but still advance our goal of becoming a digital organization, such as converting the paper application into electronic forms that can be emailed to PEO for processing. To advance our progress, PEO has engaged Deloitte to assess our current infrastructure and provide us with expertise as we plan our strategy. Ultimately, a fully digital infrastructure will increase efficiency and enhance data security, communications and our ability to analyze and report on performance.

It's easy to get excited by the big picture we're striving to achieve—the end state is so attractive. It's just as easy, however, to become overwhelmed by the amount of work required to reach our change vision. Given the breadth of our transformation, I relate our situation to preparing for a marathon rather than a sprint—moving at an appropriate pace and embracing small steps will provide us with the stamina required to finish the race. In the words of author Frank Sonnenberg, "Measuring progress is often like watching grass grow. While it's difficult to detect movement on a daily basis, it's simple to see growth over time." Big changes start with small steps. And although the new PEO is still a work in progress, I remain encouraged by the commitment of our Council and staff to realizing our goal. **e**

PEO ADOPTS NOTARIUS DIGITAL SIGNATURE FOR MEMBER USE

By Adam Sidsworth

PEO is adopting technology that will allow professional engineers in Ontario to apply a regulator-issued digital signature to engineering documents in conjunction with the image of their seal by the end of 2020. The use of the digital signature to authenticate engineering documents is voluntary.



At its September meeting, Council approved the recommendation that PEO join the Notarius program to provide PEO licence holders with the opportunity to subscribe to the digital certification service, which will still require members' stamped seals and signatures. Notarius already provides a similar service to all 11 other provincial and territorial engineering regulators across Canada.

The opportunity to use a digital signature grew out of a member motion at PEO's online annual general meeting (AGM) on May 30. Tiberiu Preda, P.Eng., introduced a motion, seconded by Alex Chong, P.Eng., to contract with Notarius to allow members to purchase a digital signature to authenticate documents. The two stated that "the timely implementation of digital [signatures] is essential to minimize the time-at-risk, or risk exposure, of practitioners who must prepare and sign electronic documents using insecure methods, at their employers' request, during the COVID-19 lockdown" and that "it is impossible for many practitioners to seal a paper copy of a document, since most do not have access to the large-format plotters and scanners that are necessary for many engineering drawings." Although delegates at the AGM urged PEO to explore sourcing a digital seal from multiple vendors, they passed the motion, with 84 per cent voting for it (see AGM Minutes, p. 38).

A digital signature is encrypted metadata including a digital certificate issued by a third party, such as Notarius, appended to PDF/A documents to confirm the identity and professional status of the document issuer and secure or tamper proof the document. The certificate information verifying the issuer holds a valid PEO licence will be available to the receiver when the document is opened with a PDF viewer. However, the digital signature is neither a seal nor a signature as required by the *Professional Engineers Act*, so members will still need to insert into their documents an electronic seal and signature, which is a scanned image of a person's handwritten signature and seal, usually in a JPEG format. Members can obtain from PEO a template of the seal to create their own JPEG.

Notarius provides subscribers with the ConsignO Desktop software used to append the digital signature to documents for a \$140 sign-up fee and \$185 yearly subscription fee; however, the total cost to engineers will be discounted to \$225 for the first year if they sign up within 90 days of

the PEO digital signature launch. Additionally, the cost is reduced to \$75 if the engineer has already subscribed to another regulator-issued digital signature. Notarius charges all professional and regulatory bodies the same \$185 yearly subscription fee.

Founded in 1996 by *Chambre des notaires du Québec*, Quebec's provincial regulator for notaries, Notarius provides a digital-trust framework to over 35 professional associations and regulatory bodies in Canada, including provincial engineering, geoscience, architecture and legal regulatory bodies, provincial ministries and departments, along with numerous private-sector organizations, many of whom employ engineers, such as WSP, Stantec, Lavalin, AECOM, Telus and Pratt & Whitney Canada. Notably, some major Canadian municipalities, including the cities of Edmonton, Vancouver and Montreal, have adopted it. Closer to home, several Ontario municipalities, including some departments of the United Counties of Prescott and Russell, have adopted Notarius' signature, and the Association of Municipalities Ontario, following an RFP process, selected Notarius as the electronic and digital signature preferred vendor and has posted results of its digital signature pilot study on its website (see amo.on.ca/YourAssociation/Partnerships/Notarius).

Additionally, the Notarius digital signature is already familiar to approximately 2500 PEO members employed by companies—notably SNC Lavalin, Hatch and J.L. Richards—who subscribe to a slightly modified version of the Notarius digital signature that demonstrates that the engineer is a current employee of the firm.

DIGITAL SIGNATURES BECOMING THE STANDARD ACROSS CANADA

PEO, not Notarius, will grant permission to PEO members to use a digital signature, which can currently be applied only to PDF-formatted documents. And although the digital signature remains optional—members will still be allowed to use their current paper-based stamped signature—PEO notes advantages to the digital signature format. Notably, PEO will be able to immediately terminate digital signatures for members whose licences have been revoked or suspended, as well as those members who are on a fee remission, have resigned or whose licence has been cancelled due to non-payment of fees. However, illegal use of a seal is a low occurrence—there have been only three cases in the last five years of lapsed members using a seal.

"This technology allows the association to control in real time who can subscribe and use a digital signature as a member of PEO," Nada Belhadfa, director of digital transformation at Notarius, explained to *Engineering Dimensions* during a Zoom interview, where she was joined by Marc St-Jacques, Notarius' vice president of sales and business development. "The beauty of the technology

is that it helps the association do what it needs to do in respect to their mission of protecting the public and it helps the member protect their work at the same time. With PEO joining, we're pretty much coast to coast [representing Canada's engineering regulators]." Belhadfa likens the technology to a passport issued by the federal government, which regulates strict deadlines with regards to identity verification and a high level of trust amongst other government agencies. She explains that PEO members will be able to register for a digital signature through a hyperlink that will appear on PEO's website and be administered by PEO staff, although the technology will be provided Notarius.

St-Jacques is quick to point out that Notarius' digital seal fits PEO regulations of an engineer's seal, as defined in section 7.3 of PEO's *Use of the Professional Engineer's Seal* guideline (peo.on.ca/sites/default/files/2019-10/UseofProfessionalEngineerSeal.pdf). He challenges members to ponder, "If you were with Hydro One, and you were getting work submitted to you by a member of PEO, do you want one that has just a picture on it with a self-signed signature, or do you want [a digital signature] that has confirmation that you're a [PEO] member and authorized to produce that work?"

Because the signature is entirely digital and unique to the member, it reduces the steps now associated with paper- and electronic-based seals and signatures: "There's so much more work in creating a paper original," Belhadfa says. "It's not just the action of stamping and sealing. Once a member or firm decides to go digital, it's really, really rare that they revert to using a stamp." St-Jacques adds: "We tried to put a dollar sign to each part of the document. We came to the conclusion that creating paper documents is three times more effort than just producing a PDF. In most cases, the original paper will get scanned, [plus] the shipping costs and the long-term archiving costs of paper versus digital. That's how we came to a three-to-one ratio."

St-Jacques says that the time to convert to digital signatures is now, in the era of COVID-19: "A lot of people lost access to plotters and printers [working at home]," he notes. St-Jacques adds that Notarius' CosignO Desktop signing tool also allows for some batch functionalities that cannot be done at all in Adobe or not easily in Bluebeam, such as a conversion to a PDF/A file, increasingly required by governments, with archive-quality standards. "There really is a combination of the digital signature confirming your identity and designation and the support tools that go along with it to make it a lot easier to prepare and sign work packages with a custom-made tool for the engineering community," St-Jacques asserts. And Belhadfa notes that digital signatures are becoming the norm and accepted technology standard: "In other jurisdictions, we have seen ministries and municipalities require a document to be signed with the association digital signature. It's only a matter of time, but at some point, it'll become universal because there's a guarantee that this document was signed by an engineer in good standing at the time of the signature. It's electronic, so it's more flexible for the municipality. It's flexibility, it's ease of use. It's not just the work of professionals but people consuming the work of professionals."

PEO REVEALS TWO-YEAR GOVERNANCE ROADMAP WORKPLAN

By Adam Sidsworth

At PEO Council's September meeting, the Executive Committee (EXE) reported on an anticipated "timed workplan" for achievement of a Governance Roadmap that was previously approved by Council in March (see *In Council, Engineering Dimensions*, May/June 2020, p. 50).

The roadmap, scheduled to guide governance reform until mid-2022, aims to enhance PEO's regulatory and governance mandate and committee structures and improve governance effectiveness. PEO has contracted with Governance Solutions Inc. (GSI)—a governance expert that also provided governance assistance to PEO in 2019–2020—for an additional two-year period to help facilitate the process and support and guide the reform efforts, in conjunction with the EXE and with Council as a whole.

LEAD-UP TO GOVERNANCE RENEWAL

The Governance Roadmap comes in response to external reviews of PEO's performance that suggested the need for Council to review its own effectiveness. For instance, although PEO's 2019 external regulatory review (also known as the Cayton Report, after its primary author, Harry Cayton of the Professional Standards Authority) was primarily focused on PEO's regulatory work, a number of its 15 recommendations also touched on governance. One of the report's recommendations suggested that PEO review all of its committees' and sub-committees' functions within a regulatory purpose. Another recommendation suggested that PEO clarify the role of councillors, staff and volunteers. There were also recommendations that touched on the role of chapters and on the composition of PEO's statutory committees and, in particular, whether they should continue to include councillors as members (see *In Council, Engineering Dimensions*, July/August 2019, p. 60).

Also at its March 2020 meeting, where the roadmap was approved in principle, Council received a Succession Planning Task Force report that recommended that Council undergo a governance review. This followed almost a year after external stakeholders—notably the Ontario Society of Professional Engineers and the Association of Consulting Engineering Companies—Ontario (then called Consulting Engineers Ontario) urged Council to undergo an external governance review (see *In Council, Engineering Dimensions*, March/



- Phase 2 will focus on PEO committees, with an aim to improve their structures and mandates;
- Phase 3 will focus on renewing Council, reviewing its composition and selection process; and
- Phase 4 will review and improve the governance effectiveness of chapters, volunteers and other areas.

Each phase will take approximately six months, although to some extent the four phases will also overlap.

In its report, provided to the September Council meeting, GSI writes that it will use “this four-step culture change process to implement the Governance Roadmap: dialogue to reach agreement, structure to embed and formalize, orientation to build awareness and education to build deep understanding and ongoing commitment.” The EXE will oversee the implementation of the roadmap and, under the overall authority of Council, will give GSI direction on which steps to take and when. GSI will also be proactive in proposing next steps throughout the project. Additionally, PEO is currently recruiting for a vice president of governance to complement Council's commitment to the multi-year Governance Roadmap. The incumbent will lead the governance strategy behind PEO's cultural change and restructure the regulator's Secretariat office to ensure that the structure, processes and practices that come out of the roadmap are properly supported.

The November Council meeting will review and finalize the draft-timed Governance Roadmap workplan.

April 2019, p. 42). Council ultimately rejected an external governance review, given that it was undergoing a regulatory review at the time.

FOUR PHASES OF THE GOVERNANCE ROADMAP

The Governance Roadmap is divided into four phases, with the first phase having predominately more work than the remaining three.

- Phase 1 focuses on Council, enhancing its effectiveness through regulatory and governance mandates;

BITS & PIECES

Toronto, ON-based company e-Zinc has developed innovative electrochemical technology for storing energy in zinc metal with the hope that the low-cost, flexible and long-duration energy storage solution will provide a platform for the world's energy markets to be fully powered by renewable energy. Photo: Alchemist-hp

Thermal desorption is an environmental remediation technology that utilizes heat to increase the volatility of contaminants so they can be removed from soil and either collected or destroyed. Soil is heated in a chamber until water and contaminants are vaporized and transported by a gas or vacuum system to an off-gas treatment system. Photo: Natural Resources Conservation Service

Researchers at the University of Toronto and Sunnybrook Health Sciences Centre have developed a handheld 3D skin printer that can deposit sheets of skin to cover large burns using “bio ink,” which is composed of stem cells. Photo: 3D Distributed

STATISTICS CANADA REPORTS THAT ENGINEERING GRADUATES ARE TOP EARNERS ACROSS CANADA

By Adam Sidsworth

A new Statistics Canada report indicates that graduates of undergraduate engineering programs in Canada are among the top earners within five years of earning their degrees. Although male engineering graduates typically earn more than their female counterparts, both men and women holders of undergraduate engineering degrees typically earn more than holders of other undergraduate degrees, including those in other science- and math-based university programs.

Statistics Canada's report, *Which Bachelor's Degree Programs Were Associated with the Highest Pay Prior to the COVID-19 Pandemic? A Focus on Very Detailed Fields of Study* was released in August 2020 and focused on the median salaries of graduates five years after graduating between 2010 and 2012. (For example, if someone earned an undergraduate degree in 2012, the person's 2017 salary was looked at.) Of the undergraduate fields explored, 118 pertaining to men and 123 for women were examined. Notably, of the top-10-paying disciplines for men, six were in engineering, and for women, seven of the top 10 disciplines were in engineering. However, it should be noted that some professions, such as medicine, dentistry, law and veterinary medicine, were not included in the study, as those disciplines typically require enrollment in a professional or graduate program or go beyond earning an undergraduate degree. Additionally, the study did not indicate how many—or if—engineering graduates were licensed with a provincial or territorial engineering regulator.

COMPARING WAGES BETWEEN THE GENDERS IN ENGINEERING DISCIPLINES

Men with an undergraduate degree in an engineering discipline were earning more in their fifth year than their women counterparts. For example, men working in mining and mineral engineering were ranked as the highest-earning men, with a median salary of \$111,533 five years after graduation, whereas the same discipline ranked as the second-highest-earning profession for women, who had a median salary of just \$89,680 after five years. Interestingly, despite the fact that chemical engineering was just the fifth highest-earning profession for men, who had a median salary of \$89,637, chemical engineering was third for women, despite the fact that they were still earning less than men, at \$82,193. However, the

study noted the low representation of women in the engineering professions, stating: "Due to smaller samples, only nine types of engineering graduates appeared on the list for women, and all were in the top 15, according to median earnings." Men, however, were represented in 23 streams of engineering, all of which appeared in the top 44 highest-earning disciplines for men. It's a notable statistic, given that in the time period 2010 to 2012, more women (87,744) earned more undergraduate degrees of all disciplines than men, of whom just 64,259 graduated.

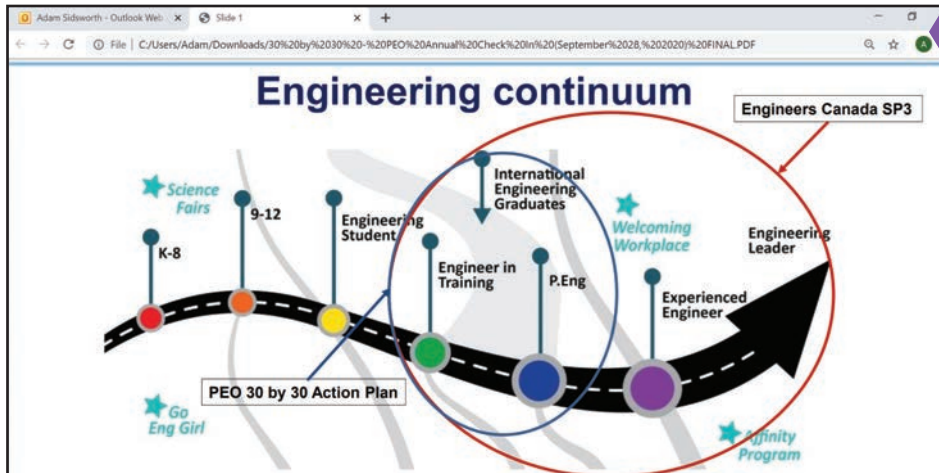
The report noted that women had more wide-ranging incomes, where the female-dominated disciplines, such as registered nursing, generally ranked lower in median income overall, while men and male-dominated disciplines, such as engineering, reported higher median incomes. "Graduates in the top 10 fields generally earned multiple times more than those at the bottom," the study reports. "For men, median earnings ranged from \$82,877 and \$111,533 among disciplines in the top 10, which was generally about two to three times more than the range at the bottom (\$42,298 and \$35,935). For women, the disparity was even larger—\$72,911 and \$94,177 at the top, about two to five times more than at the bottom (\$33,765 to \$19,892)." It should be noted that for both men and women, the 10 highest-earning disciplines were STEM (science, technology, engineering and mathematics), while the lowest 10 earning were in the arts and social sciences.

TRENDS IN ENGINEERING INCOMES

Despite the increasing trends towards newer, non-traditional engineering disciplines, the study found that engineering in the natural resources sector, along with more traditional engineering disciplines, had higher median salaries than those embracing emerging technologies. "Recent advances in artificial intelligence and automation may exert upward pressure on the wages of workers involved in developing the new technology," the study reports. "However, male graduates of mechatronics, robotics and automation engineering ranked 19th" among the engineering disciplines for men. Indeed, for men, among the highest-earning disciplines, mining and mineral engineering was Number 1, petroleum engineering was Number 3, followed by nuclear engineering (4), chemical engineering (5) and geological/physical engineering (8). And for women, mining and mineral engineering ranked at Number 2, followed by chemical engineering (3), mechanical engineering (4), industrial engineering (5), electrical, electronic and communications engineering (6), materials engineering (7) and computer engineering (10). The report can be found at www150.statcan.gc.ca/n1/pub/11-626-x/11-626-x2020018-eng.pdf.

30 BY 30 TASK FORCE ENGAGES WITH EXTERNAL STAKEHOLDERS

By Adam Sidsworth



A slide from the presentation given by PEO's 30 by 30 Task Force to external stakeholders, including employers and universities, showing PEO's commitment to addressing the underrepresentation of women licensed in the profession. The circle in blue shows to whom PEO is focusing its action plan.

During a virtual meeting of what is anticipated to be the first of an annual series of check-ins to engage with the wider engineering community, PEO's 30 by 30 Task Force shared an update of its action plan with several stakeholders, including employers of engineers, many of whom indicated that they intend to develop actions and metrics to increase women's representation in the engineering profession.

The 30 by 30 Task Force was founded by PEO Council in September 2017 to support PEO's commitment to the Engineers Canada-led initiative to raise the percentage of all newly licensed women engineers in the country to 30 per cent by 2030. A newly licensed engineer is defined as someone who obtained their licence within the calendar year.

The 30 by 30 Task Force, which consists of Chair Helen Wojcinski, P.Eng., FEC, and members Bob Dony, PhD, P.Eng., FEC, a former PEO president; Lola Mireya Hidalgo, P.Eng., a former PEO councillor; and Christian Bellini, P.Eng., FEC, PEO's president-elect, presented to the wider engineering community. In addition to representatives of industry—including, among others, Enbridge, the City of Toronto, the Ministry of Transportation Ontario (MTO), SNC Lavalin and Morrison Hershfield—the Zoom meeting also included representatives of Engineers Canada, university engineering faculties, PEO chapter leaders, executive members of the Engineering Student Societies' Council of Ontario and Society of Women Engineers Toronto, members of Council, including President Marisa Sterling, P.Eng., FEC, and PEO's CEO/ registrar, Johnny Zuccon, P.Eng., FEC.

"The annual check-in is an opportunity to monitor our progress and collectively move that needle in terms of recruits who are women to 30 per cent by 2030," Wojcinski told the attendees. "That's 10 years from now. It's not going to happen overnight, so having the annual check-in is very important."

TASK FORCE DISCUSSES ITS ACTION PLAN

The task force updated the meeting's participants on proposed actions for the next decade in order to meet its target, which it places into four categories:

- Employers' actions that can focus on the recruitment, professional development and retention of women engineers, including aiming

for a 30 per cent recruitment of women, developing an EIT/P.Eng. development plan that is cognizant of women's experiences in engineering and assigning women to positions that will develop their engineering and leadership skills;

- Universities' actions, including examining recruitment campaigns for unconscious biases towards women, collaborating with PEO to promote the value of licensure and exploring how engineering can be taught in a way that is more inclusive towards women; and
- PEO's actions, which can include targeting women for programs that help applicants complete the licensure process, such as the Licensing Assistance Program (LAP) and EIT annual work experience reviews, encouraging women to serve in more leadership roles on PEO task forces, committees, chapters and Council and showcasing progressive employers and universities who are championing the 30 by 30 goal.

FORGING AHEAD WITH METRICS

Noting that the percentage of licensed women engineers has remained stagnant in Ontario and Canada for the past five years—it was 18 per cent nationally in 2018 and 18 percent in Ontario in the same year—the committee confirmed its baseline statistics, also from 2018, with just 19 per cent of licence applicants being women, and 18 per cent of newly licensed engineers being women and of women enrolled in the EIT program. Yet the percentage of women seeking licensure support through LAP was slightly higher, at 24 per cent.

continued on p. 14

continued from p. 13

Accordingly, the 30 by 30 Task Force informed participants of proposed metrics it intends to use to help PEO meet its 2030 licensing goals. It breaks the goals into several areas, including:

- For PEO, looking at licensing metrics, such as the percentage of EITs who are women, the percentage who access the LAP and the percentage of licence applicants who are called in for Experience Review Committee interviews; and registrar statistics, such as how many PEO staff are women (in 2018 it was 62 per cent), the percentage of women in PEO leadership positions (in 2018, 33 per cent were a staff director or higher) and how many volunteer leaders and Council members are women (in 2018, 16 per cent were chapter chairs, 30 per cent were committee chairs and vice chairs, and 22 per cent of licence holders on Council were women);
- For universities, the percentage of engineering graduates who are women (21 per cent in 2018) and the percentage of first-year engineering students who are women (21 per cent in 2018); and
- For employers, the percentage of new engineering recruits who are women, the percentage obtaining licensure who are women and the percentage of women in engineering leadership positions.

EMPLOYERS DEVELOPING METRICS

Several of the employers attending the Zoom meeting have already committed to being a 30 by 30 champion and developing actions and metrics to track their success at meeting the 30 per cent goal of engineering recruits and staff being female by 2030. Among them

are Enbridge, Stantec and MTO, with the MTO already sharing its MTO Engineering Development Program to gauge female engineers participating in the program. Currently, 49 per cent of its current participants identify as women.

COMMENTS FROM PARTICIPANTS

The last part of the meeting allowed participants to ask questions of the 30 by 30 Task Force and PEO staff and volunteers. Many participants, particularly the employers, engaged in comments and questions that demonstrated their awareness of the 30 by 30 goals, notably Julia Formosa, P.Eng., of the Greater Toronto Airport Authority, who noted that she would give the 30 by 30 some consideration in their supplier management program.

For more information about PEO's 30 by 30 Task Force, including how to become an employer committed to developing actions and metrics aligned with the 30 by 30 goals, contact Tracey Caruana, P.Eng., PEO manager, engineering intern programs and 30 by 30 Task Force committee advisor at tcaruana@peo.on.ca, or visit the 30 by 30 webpage at peo.on.ca/about-peo/committees-and-task-forces/30-30-task-force.

QUEEN'S ENGINEERING FACULTY BEGINS DIVERSITY INITIATIVE FOR BLACK STUDENTS IN STEM

By Adam Sidsworth

In a bid to make an engineering education and careers more inclusive, Queen's University's engineering and applied science faculty is initiating an outreach program to encourage Black Canadian youth to consider post-secondary education and careers in science, technology, engineering and math (STEM). Although the program is in its early stages, it has already hired two Black student instructors to develop and administer an outreach program that engages Black youth and their families in the Kingston, ON, area in STEM activities.

Black Youth in STEM was anticipated to begin earlier this fall, with after-school clubs for grade-school students, but according to Melanie Howard, director of Aboriginal Access to Engineering (AAE) at Queen's University, who is spearheading the new initiative, the timelines may have to be adjusted because of the realities of physical distancing that has become the norm in a post-COVID Ontario.

"The biggest thing that people don't realize is that it's not a recruitment program," Howard said of AAE, from which the new Black Canadian outreach will draw inspiration. Howard participated in a Zoom interview with *Engineering Dimensions*, where she was joined by Kevin Deluzio, PhD, P.Eng., dean of Queen's faculty of engineering and applied science. AAE was founded in 2011 to increase the number of Indigenous professional engineers in Canada. It consists of:



- Academic and culturally informed student support and unique space for Indigenous engineering students at Queen's;

- An outreach STEM program aimed at Indigenous students in all grades; and
- Support from the wider Indigenous and engineering community and non-profit organizations, such as Actua, which engages young Canadians in hands-on STEM to break down barriers to participate in STEM education and careers; and the American Indian Science and Engineering Society (AISES), an American-based organization that seeks to increase Indigenous-North American representation in STEM studies and careers. (Queen's is currently the only Ontario university with an AISES chapter, of which Howard is the advisor.)

CHANGING THE CULTURE

Students at Queen's University have already successfully established a chapter of the National Society of Black Engineers (NSBE), which, similar to AISES, is an American-based non-profit organization with a mission "to increase the number of culturally responsible Black engineers who excel academically, succeed professionally and positively impact the community." Howard is serving as advisor to the Queen's NSBE chapter, and the group organized its first NSBE events for this fall.

"There's no such thing as a monolithic Black or Indigenous community in Kingston," says Howard. Howard cites recent police shootings of Indigenous people in Canada and adds: "I think it's a recognition that our communities face similar issues and challenges, and when I look at Queen's, it's possible that we have less Black students in engineering than Indigenous students."

Dean Deluzio is careful to note that his faculty's new initiative is not intended to be a recruitment campaign to attract prospective students of colour to Queen's University's engineering programs but rather to encourage Black Canadian youth in the Kingston area to recognize that STEM is inclusive of all people. "We're working to change the culture in a way that makes it more inclusive," Deluzio says. "There are all kinds of issues we have on campus and everywhere else. We have to move to change our community and culture." Deluzio praises the positive work that Howard and the AAE team have done during their almost 10-year-long existence: "Melanie's team has worked with over 20,000 youth up to this point. I'm hearing a willingness to listen and a dialogue that makes it a factor. My perspective as a dean of an engineering program is looking at these solutions of massive societal problems and needing engi-

neers to find solutions. And these solutions won't have an impact if these solutions don't bring diversity into the equation."

Howard adds that when prospective Indigenous engineering students learn of Queen's AAE, with its space for Indigenous engineering students and other support services, it can be a contributing factor to their acceptance and offer to Queen's engineering programs. "There were only four Indigenous students 11 years ago, and now there are over 50," Howard notes. "We're at 42 who have graduated so far." Additionally, an increasing number of Indigenous engineering students are pursuing postgraduate studies at Queen's. Both Howard and Deluzio cite Queen's high retention rates of all students in many of its programs, and AAE is an additional tool for Indigenous engineering students to utilize when working toward their engineering degrees.

PROVIDING AN INCLUSIVE SPACE

Howard and Deluzio cite not only a necessary space for Black engineering students on campus and an effective outreach program to Black Canadian youth in Kingston but also a program that reflects the people that the program is targeting. "We're hiring from the Black community to deliver programming with the Black community," Howard says. "We bring in role models because kids need to see this idea for them: 'Here's somebody from a community I know who's out there.' That, to me, is extremely important for Black youth." Additionally, Howard polled her contacts in the small Black Canadian community in Kingston to gauge their support and feedback. "I would never pronounce anything on my own," Howard says. "It was important that I reach out to people and say, 'If I were to do this, what would you think?' And I got a resounding 'Yes!' These are friends and colleagues I've known for years. They would have said, 'You're overstepping it a little bit' if they didn't think it would be natural that the Indigenous community would reach out to the Black community."

An important lesson that Howard learned from the AAE is that it isn't enough to go into a community just once and expect the kids to be hooked. Instead, a constant and long-spanning program is required, or kids will quickly forget.

Queen's initiative comes as engineering faculties across Canada become more aware and increasingly assertive in their inclusion of demographics that have long been underrepresented in Canada's engineering profession. The University of Toronto's (U of T's) faculty of applied science and engineering, which founded its NSBE chapter in 1999 and hired its first dean's advisor on Black inclusivity initiatives and student inclusion and transition mentor in 2018, initiated a new outreach program targeted at Black youth earlier this year. Called Blueprint, Black youth in Grades 9, 10 and 11 participated in three STEM courses—conducted online because of COVID-19—taught by U of T engineering graduate students over the summer of 2020, followed by year-long student engagement and mentorship. Blueprint joined ENGage, U of T's one-week day camp program created a decade ago to encourage Black youth in Grades 3 to 8 to explore STEM subjects.

ESSCO EXECUTIVES MEET CHALLENGES OF A COVID-19 WORLD HEAD ON

By Adam Sidsworth



In a year that has seen Ontarians of all walks of life challenged by the COVID-19 pandemic and the accompanying harsh realities of physical distancing, the Engineering Student Societies' Council of Ontario (ESSCO) 2020–2021 executives met with PEO's outreach and engagement team on September 1 via online meeting platform Zoom for their annual meeting to talk about ESSCO's upcoming year.

"We have six goals [this year], and we are calling them our 'six cents,'" ESSCO President Alexa Bautista, a fourth-year industrial engineering student at Ryerson University, told PEO's Tracey Caruana, P.Eng., manager, engineering intern programs. "Our team wanted to prioritize increasing the awareness of ESSCO to the common engineering student, increasing awareness of membership benefits, increasing external revenue streams, partnering with more advocacy organizations, increasing our mental health resources and adding more non-conference activities."

Bautista was joined at the meeting by fellow ESSCO executives, including Advocacy Vice President Abby MacGillivray, a fourth-year aerospace engineering student at Carleton University; Communications Vice President Carol Wasef, a third-year biomedical engineering student at Ryerson University; Services Vice President Cameron Davis, a third-year software engineering student at Carleton University; and Amal Siddiqui, a fifth-year environmental engineering student at the University of Windsor (U of W), and Keenan Hossack, a fourth-year electrical engineering student from U of W. Siddiqui and Hossack are co-

chairs of the 2020 PEO Student Conference, which happened over the weekend of September 25 (see p. 18).

ESSCO is an umbrella organization of student engineering societies from 14 universities and colleges from across Ontario, while two additional engineering student societies from Queen's University and the University of Toronto (U of T) have observer status. ESSCO receives financial assistance from PEO, which also sponsors ESSCO's yearly conference. This year's conference was held online because of the COVID-19 pandemic.

Bautista said that the COVID-19 pandemic and the accompanying online learning that many engineering students will experience throughout the 2020–2021 academic year isn't far from the ESSCO team's mind: "Since we took over in May, we started three new working groups," Bautista explained. "We started up a long-distance and online learning group that's taking a pulse with how students are transitioning to online learning." Another working group will explore "personalized learning strategies and different types of goals that students have and what students can be successful at," while another will look at how "student leadership roles can be applied to a credit or degree instead of taking an elective or co-op program."

ESSCO SEES AN INCREASE IN PARTNERSHIPS IN 2020

Davis, meanwhile, spoke of ESSCO's increased partnerships with external organizations to better help engineering students as they transition from their education to careers. "We've been working with National Bank for their national financial literacy month and outreach during the month of November," Davis explained. "We've seen students assess their financial status to overcome certain barriers that they're facing, including OSAP (Ontario Student Assistance Program)." And in a nod to the fact that the engineering profession is becoming increasingly environmentally conscious, Davis noted that "we're looking to partner with a lot of green energy groups for our sustainability month, which will be coming up in November, when we will be looking to educate students to be more sustainable and challenge them to make those changes in their daily lives." And in an acknowledgement that many engineering students may struggle during this virtual academic year, Davis added that "we also have the mental health fund, which will be running this year, and we've recently confirmed our partnership with jack.org." Jack.org is an online organization that aims to empower young leaders when it comes to mental health.

MacGillivray also updated PEO on ESSCO's increased partnerships, noting that the previous year "was a really big year for policy for adding partnerships. We had a fleshed-out structure on how to follow through on partnerships. Right now, we're figuring out what our standards are for future partnerships. We'll look into organizations [to see] that they align with our goals and beliefs so that we don't accidentally partner with a company or organization that might tarnish our organization." MacGillivray added that ESSCO will once again partner with Project Management Institute of Toronto (PMIT), a U of T-affiliated not-for-profit membership association that advocates for project management. Last year, PMIT provided ESSCO with multiple seminars, including one on general project management.

accounting for 118 researchers and PhD students accounting for 141. However, 84 undergraduate students and one high-school student also participated in the research. Additionally, 86 were post-doctoral fellows, and an additional 20 were identified as “other researchers.”

Most of the research is being done within the mechanical and biomedical engineering disciplines; each with 57 projects. Mechanical engineering projects, along with mechatronic engineering projects, were, unsurprisingly, equipment focused, looking at the development of anti-viral surface coatings and the use of the 3D printers for personal protective gear, such as N95 masks, face shields, hands-free door openers and ventilator components. “A significant challenge for any vaccine will be the scalability of production to generate sufficient doses,” Wells and Israel say. “An example of this is the development of a dual-modality DNA-based COVID-19 vaccine that could be delivered through a nasal spray. And [engineers] are working to prepare the production and supply-chain delivery process that will efficiently manufacture and dispense the billions of doses needed to ensure populations are quickly protected.”

Chemical engineering accounted for almost 40 research projects that centred on PPE and surface research, as well as diagnostics on people. Civil, computer and electrical engineering projects had smaller numbers of projects. Civil engineering research is overwhelmingly focused on infrastructure and activities that centre around transportation, city planning and risk management to help us understand the impact on people’s everyday lives and on our health-care systems in addition to network science, machine learning, systems analysis and multi-objective optimization linked to our physical and infrastructure. Additionally, computer and electrical engineers are predominately focused on diagnostic and tracing research projects.

ANNUAL ESSCO CONFERENCE GOES ONLINE

By Carrie Wasef



A screenshot of a page from ESSCO’s website, essco.ca/covid-19, which details ESSCO’s efforts to help Ontario’s engineering students during COVID-19 and physical distancing protocols

The annual PEO Student Conference (PEO-SC) took place virtually during the weekend of September 25 to 27. Students from the University of Windsor (U of W) hosted the conference, which included 70 delegates representing 15 engineering faculties from across Ontario.

The PEO-SC is an annual event that is overseen by the Engineering Student Societies’ Council of Ontario (ESSCO) and is hosted each year by one of ESSCO’s 14-member engineering faculties’ student councils. It is a professional development conference with a focus on helping engineering students explore pathways to licensure with PEO, along with exploring other professional routes in engineering. The conference is made possible by the financial assistance of PEO, whose support made this year’s conference in particular possible due to the sudden changes and dramatic adaptations that were required due to the COVID-19 pandemic. Because this was just ESSCO’s second-ever fully online conference, many challenges arose. However, delegates reported the conference was a valuable experience.

This year’s PEO-SC theme was “Connecting to the future,” which tied into the online format, connecting engineering faculties from across Ontario into delegates’ living rooms. The co-chairs of the conference, Keenan Hossack, a fourth-year electrical engineering student at U of W, and Amal Siddiqui, a fifth-year environmental engineering student at U of W, explained the theme in the delegate package sent out to all the attendees prior to the conference: “One of Windsor’s famous landmarks is the Ambassador Bridge, a 2,286-metre, teal-coloured suspension bridge connecting Canada to the United States. The bridge is an essential artery in Canada’s economy, being the busiest border crossing with [our] largest trading partner. With this conference, we hope to bridge the connection between engineering education and student delegates’ future careers through captivating speakers and thought-provoking discussions.”

COPING WITH AN ONLINE WORLD

Because this year’s PEO-SC delegates were unable to attend the conference in person, the organizing committee projected a few images

of Windsor, ON's Willistead Manor, the venue where the conference gala would have been held. Delegates were encouraged to dress up for the duration of the conference and asked to use the images as their virtual background on Zoom, the online meeting platform used for the conference.

SPEAKERS ADDRESS THE DELEGATES

Tracey Caruana, P.Eng., PEO's manager, engineering intern programs, spoke about the importance of pursuing a P.Eng. and the complexities and ever-changing aspects of licensing. She highlighted the statistics of the licence, including its growth and impact on many emerging and non-traditional engineering disciplines. Students, many of whom could be impacted by PEO's possible regulation of these newer disciplines, asked many questions, creating a space for discussion. Presenters from the province's advocacy body, the Ontario Society of Professional Engineers (OSPE), were also in attendance and presented on its advocacy initiatives that aim to represent engineers at the provincial level.

Because of the increasing number of engineering opportunities in emerging and non-traditional disciplines, the conference held a session to give delegates an opportunity to consider a variety of career and education options after graduating from their undergraduate engineering degrees. This was done with panel discussions on traditional and non-traditional engineering careers and another panel on pursuing a master's degree. Additional sessions were held to help advance attendees' career interests, with presenters from business and human resources fields. Presentations included one hosted by California-based Jonathan Javier, CEO/founder of Won-

sulting, on leveraging your LinkedIn profile; and another by Rod Case, a partner of management consulting firm Oliver Wyman, on the hiring process and building your network, helping delegates develop the tools they need to be prepared and confident as they go into their future careers.

Other talks were about engineers' responsibilities in the social and environmental spheres. One valuable conversation included a comprehensive equity, diversity and inclusion presentation hosted by ESSCO inclusivity commissioner and University of Waterloo biomedical engineering student Claire Thompson. This session engaged students to consider their own biases and how the effects of inclusivity span throughout their lives and careers. Presentations on inclusivity and sustainability provided even more context on how the future rests in the hands of this generation and how important it is that they consider the effects of their actions. And another important talk was given by Edwin Tam, PhD, P.Eng., associate professor of civil and environmental engineering at U of W, who spoke on the best practices of engineers and technologies they can develop to combat climate change.

Carol Wasef, ESSCO's vice president of communications, is a third-year biomedical engineering student at Ryerson University.



PEO Brampton Chapter 2021 Annual General Meeting
Wednesday, January 22, 2021, from 7 p.m. to 9 p.m. EST
Register at eventbrite.ca/o/peo-brampton-chapter-28909623641

PEO Etobicoke Chapter 2021 Annual General Meeting
Wednesday, January 27, 2021, from 7 p.m. to 9 p.m. EST
Register at eventbrite.ca/e/etobicoke-chapter-annual-general-meeting-tickets-121732425963

ARE YOU INVOLVED IN YOUR LOCAL PEO CHAPTER?
PLEASE MAKE NOTE OF THE UPCOMING CHAPTER ANNUAL GENERAL MEETINGS, CURRENTLY BEING PLANNED AS VIRTUAL MEETINGS. REGISTERED ATTENDEES WILL BE UPDATED AS PLANNING PROGRESSES.



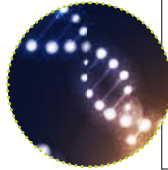
PEO Oakville Chapter 2021 Annual General Meeting
Wednesday, January 27, 2021, from 7 p.m. to 10 p.m. EST
Register at eventbrite.ca/o/peo-oakville-chapter-28909659893

PEO London Chapter 2021 Annual General Meeting
Friday, March 7, 2021, from 12 p.m. to 2 p.m. EST
Register at eventbrite.ca/e/london-chapter-annual-general-meeting-tickets-121789045313

Attend Virtually

The following events can be attended via videoconferencing (see individual websites for details).

November 2020



NOVEMBER 18–19
Material Science & Nanotechnology
coalesceresearchgroup.com/conferences/materialscience

NOVEMBER 18–19
Open Innovation
Virtual Summit
vonlanthengroup.com/en/4th-annual-open-innovation-summit

December 2020

DECEMBER 3–4
International Conference on Climate Modeling and Weather Predictions
waset.org/climate-modeling-and-weather-predictions-conference-in-december-2020-in-amsterdam



DECEMBER 3–4
International Conference on Cyber Security for Internet of Things
waset.org/cyber-security-for-internet-of-things-conference-in-december-2020-in-amsterdam

DECEMBER 10–11 
International Conference on Advanced Industrial Engineering and Technology
waset.org/advanced-industrial-engineering-and-technology-conference-in-december-2020-in-new-york

DECEMBER 10–11
International Conference on Advances in Computational Neuroengineering
waset.org/advances-in-computational-neuroengineering-conference-in-december-2020-in-london

DECEMBER 10–11
International Conference on Architectural Engineering Design
waset.org/architectural-engineering-design-conference-in-december-2020-in-london



DECEMBER 10–11
International Conference on Automatic Control Engineering
waset.org/automatic-control-engineering-conference-in-december-2020-in-new-york



Listen



In Machines We Trust
A podcast about the automation of everything, presented by the MIT Technology Review team
forms.technologyreview.com/in-machines-we-trust

99% Invisible
A podcast about all the thought that goes into the unnoticed architecture and design that shape our world
99percentinvisible.org

Soft Skills Engineering
A weekly advice podcast for software developers because it takes more than great code to be a great engineer
softskills.audio

Read



Introduction to Optics, by Frank L. Pedrotti, Leno M. Pedrotti and Leno S. Pedrotti, 2017: A comprehensive introduction to optics that goes beyond traditional areas to include the use of matrices in dealing with ray tracing, polarization and multiple thin-film interference, as well as lasers, the optics of the eye, holography and interferometry.

Nanofabrication: Principles, Capabilities and Limits, by Zheng Cui, 2018: A comprehensive exploration of nanofabrication technologies and an introduction to the developed technologies capable of making structures below 100nm, their capabilities and the limits preventing a technology from going further down the dimensional scale.

Watch



Heritage Minute: Elsie MacGill
This Heritage Minute follows Elsie MacGill, Canada's first practising woman engineer, in her role overseeing the production of the Hawker Hurricane aircraft.
youtube.com/watch?v=stnMHGw8qkQ

Can Underwater Turbines Solve Our Energy Problems?
The energy from waves, tides and currents, known collectively as ocean energy, is a massive resource just waiting to be tapped.
youtube.com/watch?v=CIYA6Jwwp4s

HOW TO HANDLE REMOTE SUPERVISION OF ENGINEERING SITE REVIEWS

By José Vera, P.Eng., MEPP

During this year's COVID-19 pandemic, PEO's practice advisory team has received several questions from practitioners on whether they can still conduct site visits or supervise a competent person to conduct them on their behalf using telephony technology, such as Google Meet, Microsoft Teams, Skype or Zoom. Here we provide a framework with examples for practitioners seeking to address these issues.

REMOTE SITE REVIEW REQUESTS

Andrea, a professional engineer working for YYZ engineering, receives a phone call from Louis, a project manager for YUL Construction, requesting that her firm provide general review of construction for a rooftop solar panel structure installation in a hospital in southwestern Ontario. Louis also informs Andrea that the hospital is not allowing any new visitors to the construction site due to a recent outbreak of COVID-19 in the region. Consequently, the hospital's management is requesting YYZ to provide a site review remotely using telephony technologies in place of an onsite visit. Andrea finds it problematic to perform a review without going onsite, since she knows that not visiting the site could result in legal and safety risks. So, as a compromise, she offers to conduct the site review in person while wearing a hazmat suit. Louis states that hospital management's decision is final, so she cannot visit the site. Andrea asks if the site review could be done later, once new visitors are allowed in the construction site, but Louis says they need the review done promptly, since the construction of the solar structure is being fast-tracked. What should Andrea do?

ENGINEERING SITE REVIEWS AND THE LAW

Andrea decides to consider their request for a remote site review but notifies Louis that she needs to discuss this request with YYZ's management team and legal counsel before a final decision is made. Andrea meets with the management team at YYZ, and she brings up a PEO discipline decision, where: "The panel believed that the lack of a site visit by the member was an important omission that led to several problems" (see Decision and Reasons, *Engineering Dimensions*, May/June 2010, p. 29). Furthermore, Martina, YYZ's legal counsel, refers to three passages from three different engineering law books referenced



A client asks an engineer to provide a site review remotely using telephony (such as FaceTime or Zoom) due to an outbreak of COVID-19 onsite, resulting in a policy of no site visits. The engineer is concerned that providing a review while not physically visiting the site could result in legal and safety risks. What should the engineer do?

in *R. v. Williams Engineering Canada Inc.*, 2014 ABPC 241 (CanLII) (canlii.ca/t/gf6vfv):

- [62] "while not theoretically bound to visit the site personally in the preliminary stages of his engagements, an engineer who does not do so, or check carefully any surveys or site information provided by others against what can be seen and measured on site, will be at considerable risk, since there are many matters affecting a project" (*Hudson's: Building and Engineering Contracts*, p. 307)
- [63] "It is the case that an engineer employed by an owner and working under the standard form contract CCDC-2 cannot rely on information supplied by others as to site conditions, apart from 'specially trained and retained consultants'" (*The Canadian Law of Architecture and Engineering*, p. 122)
- [64] "The engineer cannot rely on others as to evaluation of building site conditions where the conditions require independent engineering expertise" (*Halsbury's Laws of Canada, First Edition*, p. 388)

continued on p. 22

continued from p. 21

Martina further notes that while these references do not specifically mention general review of construction as per the Ontario Building Code, they still make a strong case for physically visiting the site.

REASONABLE SUPERVISION

During the meeting, Rashida, the engineering manager at YYZ, refers to section 12(3)(b) of the *Professional Engineers Act*, which provides an exception to licensure for persons working under the supervision of an engineer assuming responsibility for the work. Furthermore, Rashida notes that the Construction of a Building performance standard cited in the practice guideline *Professional Engineers Providing General Review of Construction as per the Ontario Building Code* states: "The professional engineer may delegate one or more of the functions or requirements...to another person if it is consistent with prudent engineering practice to do so and the functions or requirements are performed under the supervision of the professional engineer."

Andrea adds that the practice guideline *Assuming Responsibility and Supervising Engineering Work* quotes from the book *Engineering Law* the following concept of reasonable supervision: "The engineer must give reasonable supervision to the work. He (or she) is not required to do everything in the way of watching the direction of works under his (or her) charge, but he (or she) is required to give such care and attention to the work while it is in progress as the nature and difficulties of the particular work reasonably demand."

Andrea further adds that although no new visitors are allowed onsite, anyone who was previously onsite is still being allowed to enter and work on the site. Based on this information, Martina and Rashida ask Andrea if she could reasonably supervise a suitable person remotely, preferably an engineer, who has already been onsite and would, therefore, be eligible to provide the site visit. Andrea calls Louis to find out if there is an engineer onsite who would be willing to be supervised by her for the site visit. Louis says no but informs her that Javier, a construction technologist who works for YUL, has been working onsite and would be glad to provide the general review site visit under Andrea's supervision. Although Javier is not a professional engineer, he graduated from civil engineering in Colombia and is the most competent person available onsite for this specific project. Andrea decides that under the circumstances, she can reasonably supervise Javier remotely. Therefore, Martina contacts YUL's legal counsel to collaborate on a mutual agreement for the general review project that delineates the responsibilities of YYZ and YUL.

TECHNOLOGIES FOR REMOTE SITE REVIEWS

Besides supervising Javier, Andrea decides that it is prudent for her to watch live video of the construction site. After doing some research, Andrea finds a helpful article on technologies for remote site reviews from the American Society of Civil Engineers: ascelibrary.org/doi/10.1061/%28ASCE%2

9ME.1943-5479.0000336. Andrea uses the information in this article to develop a system to observe the construction site live, specifically the installation of the solar panel structure, while supervising Javier using telephony.

EMERGENCY STRUCTURAL CONDITION ASSESSMENTS

A few months after completing the general review project, Andrea receives a call from Pierre, who works for YVR, a different client. Pierre informs her there are concerns the structural adequacy of a food processing plant may have been compromised after a forklift collided with some columns. However, Pierre notes that due to a recent COVID-19 outbreak, only the workers are allowed in the plant. So, Pierre proposes that Andrea conduct a remote site review. Andrea disagrees with this proposal and convinces Pierre it would be best for her and her team of engineers to visit the site immediately, due to the urgency. Specifically, Andrea states that she cannot reasonably supervise others remotely to conduct a structural condition assessment because of the difficult nature of this work, so YVR's management needs to allow her and her team to go onsite. Management agrees that a site visit is a must. Before going onsite, Andrea consults with a medical practitioner, who advises that she and her team wear personal protective equipment and follow physical distancing protocols during the site visit to reduce the risk of contagion. Fortunately, Andrea and her team develop an effective repair plan for the columns, and all ends well.

Below is a summary of some of the key points made in this article:

- Law texts and case law make a strong case for onsite visits by engineers;
- However, in specific circumstances, suitable non-engineers reasonably supervised by an engineer may be able to provide site visits;
- Furthermore, some technologies allow engineers to observe construction sites remotely;
- Nonetheless, under certain conditions, it may not be reasonable for engineers to remotely supervise site reviews, and in these cases, a prudent engineer may need to go physically onsite while following the advice of medical professionals to reduce health risks in the event of an outbreak; and
- Because these situations often involve legal risks, practitioners are encouraged to seek the advice of their management, their firm's legal counsel and insurance professionals.

Finally, PEO's practice advisory team is available by email at practice-standards@peo.on.ca and is glad to hear from practitioners looking for more information on the practice guidelines mentioned in this article.

[José Vera, P.Eng., MEPP, is PEO's manager of standards and practice.](#)

EIT SUCCESSFULLY BRIDGES SCHOOL AND CAREER DURING TURBULENT TIMES

By Adam Sidsworth



Laura Tauskela, EIT, addresses dignitaries from Queen's University, the Ministry of Transportation Ontario and industry partners during a July 2018 unveiling of ROLLS.

When Laura Tauskela, MASc, EIT, was finishing up her master's degree—which focused on bridge design and repair—in civil engineering from Queen's University in Kingston, ON, in January of this year, she was offered a position as a bridge designer EIT with Jacobs, an international solutions provider with a focus in intelligence, water, infrastructure, renewal and cybersecurity. However, in March, COVID-19 reached Canada, virtually paralyzing Ontario's economy. And although Tauskela initially feared this meant she would lose her first engineering position after finishing her degrees—her undergraduate degree in civil engineering is also from Queen's—she began her position at Jacobs in May as scheduled, working remotely. Fortunately, Tauskela has received a tremendous amount of support at Jacobs: "I was fortunate enough to meet a few of my team members during my interview," Tauskela says. "Some of the people I work with on a daily basis I've never actually met face to face, but everybody's been really nice, and I've been pleasantly surprised by everybody who's

reached out to me to see how I'm doing and introduce themselves. I feel like it could have been a strange, lonely experience starting out, but it wasn't."

SERENDIPITY AND DETERMINATION

Tauskela freely admits that she serendipitously fell into engineering. In fact, when she was in her last year of high school, Tauskela had no idea what engineers did, despite the fact that her grandfather was a chemical engineer. "All I knew is that he got to travel all over the world and solve companies' problems," she says. "I really didn't know what he did that well." And despite the grandparental connection to engineering—she even toured her grandfather's alma mater, McGill University—Tauskela chose to pursue civil engineering at Queen's after being introduced to the principles of engineering by a high school physics teacher. Additionally, her parents, who both work in the sciences, jokingly steered her away from enrolling in a Bachelor of Science degree, saying, "Don't go into science unless you want to be in school until you're 30!"

During her undergraduate degree, Tauskela was employed in engineering-related summer jobs that sparked her interest in bridges, including a summer engineering position with the City of Ottawa. "Ottawa assigns each summer student to a construction inspector and to one or two projects, and mine was building a new pedestrian bridge," Tauskela recalls. "I was on that bridge project all summer. One of the highlights was being able to watch this prefabricated steel bridge be lifted into place overnight. And towards the end of the summer, I was also put on a culvert project, so I got to see different transportation projects." The City of Ottawa job helped Tauskela realize how much she enjoyed interacting with contractors and being able to translate drawings into an actual structure before her eyes. Her field experience in Ottawa landed her a second summer job as an estimating intern at Kiewit in Oakville, ON. They valued her field experience, and although Tauskela was tasked to work on a ferry docks project, she was happy to be gaining experience in the transportation sector.

WORKING ON ROLLS

"One of the main reasons I did [a graduate degree]," Tauskela says, "was that I did my research and talked to people who worked in the field, as well as grad students and alumni, and the resounding thing that I learned is that if you want to work in structural engineering, a master's is valuable because a lot of people go into engineering, and [employers] are able to be picky." So Tauskela applied and was accepted to do a master's degree in civil engineering at Queen's under the supervision of Amir Fam, PhD,

P.Eng. Fam, who also supervised Tauskela during her fourth-year undergraduate thesis and invited Tauskela to do research with him on the rolling load simulator (ROLLS), for which he received funding from the Ministry of Transportation Ontario (MTO). ROLLS simulates the forces borne by a bridge when large and small vehicles drive across, collecting data later analyzed by researchers and students to assess the performance of all aspects of the bridge structure, including the deck, girders, joints and connections of many types of bridges. ROLLS is unique because, unlike previous test technology, it drives back and forth over the test material—like vehicles would—recreating the forces bridges undergo every day and over a long period of time. Referring to ROLLS, Tauskela says: “It’s the first in Canada and one of a few in the world that’s able to test bridge components under full-scale truck loads in a lab. It’s novel and cutting edge, and it was interesting and relevant to what I’m interested in.” Tauskela was also attracted to ROLLS’ potential environmental savings, noting that many civil engineering projects are environmentally taxing, and the “overarching objective of this research would be to improve the construction of bridge decks, which blends itself to sustainability because if you can figure out better timelines for construction, or if you can use less materials, that will lead to more sustainable construction.”

Tauskela was actually the second graduate student to have the opportunity to work on ROLLS—the previous graduate student, Duncan Brennan, was able to use ROLLS on a bridge girder that had failed an inspection and had been donated by MTO—but Tauskela went one step farther and constructed her own bridge in the lab and tested the bridge’s construction with ROLLS. “The definite highlight of my master’s was getting to build that 50-foot-long concrete bridge in a lab,” Tauskela says proudly. “I had to source all of the different sub-contractors myself, and two other graduate students and I assembled all the rebar cages inside the bridge deck—all concrete bridge decks are reinforced with reinforcing bars on the inside; that’s what gives them their strength—and standing inside the wood framework and tying all the rebar cages together in the summer heat.”

Tauskela and her team were able to watch two concrete trucks come into the lab and pour the concrete onto the bridge. “It was a real-life project,” Tauskela says, “and I was like the project manager.” Tauskela’s leadership skills were noticed by Kevin Deluzio, PhD, P.Eng., professor and dean of Queen’s faculty of engineering and applied science, who told *Engineering Dimensions*: “I met [Laura] at a presentation she was doing; I was there to meet the research [team]’s industrial partners and the MTO.



Laura Tauskela, EIT (centre), ties GFRP bars, along with Amir Fam, PhD, P.Eng. (left), and Fam’s current graduate student, Severus Gao, on a bridge that Tauskela helped to design and construct to test ROLLS.

She was early in her master’s and it was a pretty high-profile room, and she came in there and owned it within minutes because of her competence and the quality of her work.” Indeed, Fam specifically asked Tauskela to work on ROLLS with him because of her leadership qualities and expertise: “Laura is one of the most dedicated and hardworking students I have supervised in the past 20 years. She has done an incredible job managing a very complex project, from design to construction to testing. We are very proud of Laura.”

Reflecting on her engineering success, Tauskela is proud to join her grandfather in her family’s emerging multigenerational engineering tradition: “I think it was a really cool experience for him getting to watch his first granddaughter pursue engineering and then see two other granddaughters after that go into engineering—my sister and then my cousin,” Tauskela said. Interestingly, Tauskela’s sister recently started her first year of her master’s engineering degree at Queen’s—a sibling tradition. **e**

A BLUEPRINT FOR PEO'S FUTURE

By Patrick Quinn, PhD, P.Eng., C.Eng., FEC, Roydon Fraser, PhD, P.Eng., FEC, and Stephen Armstrong, P.Eng., C.Eng.

The speed at which societal change is affecting PEO requires urgent, nimble and quick actions toward progressive changes to stop the profession's slide into irrelevancy. In an age when technology is a primary driver, it is in the public interest to have a regulator that promotes positive, progressive goals and an engineering profession committed to high achievement and ethical practices. The profession must now find leaders who can express these goals and inspire actions that will achieve them.

In two previous Viewpoint articles ("The need for radical change from within," *Engineering Dimensions*, July/August 2020, p. 32; and "Guiding the profession into the future requires a focus on education and ethics," *Engineering Dimensions*, September/October 2020, p. 44), we suggested that the continuance of engineering as a major, publicly recognized profession requires an accepted vision for the future with specific goals in the areas of education, licensing and ethics. The following is a first draft of goals toward reversing the current path of our profession's public decline and making PEO relevant to those economic drivers of emerging disciplines, entrepreneurs and industries that do not fall under demand-side legislation.

ENGINEERING EDUCATION GOALS

1. Provide a breadth of education that covers basic engineering subjects as a foundation for the continued learning that evolving technology demands and the inculcation and cultivation of subjects on humanities, leadership and ethical consciousness.
2. Equip our graduates with the skills necessary to be the go-to change agents and innovators in technology, capable of communicating with the public as authorities of technology.
3. Encourage a philosophical expression of support for innovation from engineering educators and incentivize learning for learning's sake.
4. Rally universities to participate in an accreditation system that encourages innovation and responds quickly to desirable changes. National standards are in the best interest of the profession in a global economy.
5. Show graduates the benefits of licensing.

LICENSING GOALS

1. Protect the extremely valuable P.Eng. brand by constantly updating the *Professional Engineers Act*.

2. Maintain a database that follows areas of practice and the evolution of distinct disciplines.
3. Establish distinct disciplines by defining their scope and providing distinct professional practice standards.
4. Issue licences in categories that recognize demand-side requirements and that accommodate accreditation and the global realities of international education, skills and movement.
5. Establish a national reciprocity of licensure beyond the current agreements to promote and accommodate interprovincial and international mobility and practice in a global economy.

ETHICAL GOALS

1. Establish a Code of Ethics for the profession that recognizes the modern realities of sustainability and social conscience and aspires the concept of "going the extra mile" in service to society and to clients.
2. Promote and inculcate sustainability and social conscience ethics throughout engineering education and practice.

An initiative for starting this change process is required and PEO—with a membership of almost half the nationally registered engineers and the necessary financial resources—should undertake to accept the leadership role. The following is a suggested action plan:

1. Pass a resolution at Council authorizing PEO to fund a "Future of the Profession Action Initiative" and set up a task force.
2. The task force would organize data collection and a broad discourse—including outreach nationally to other engineering regulators and learned societies—on aspirations for the future of the profession as a basis for a national symposium.
3. The task force would appoint a national symposium planning committee and chair to organize a national symposium within a year, with the objective of agreeing on goals for the future of the profession and a strategy for achieving these goals with measurable expectations and timelines.

The challenge starts with accepting that the decline in public recognition is real and then identifying and agreeing to goals with "society-respected relevance" as the single overriding goal. The decline can and must be reversed, and it will be if we accept reality and find leaders who recognize that we must act with urgency and take the actions necessary to positively take control of our future. As a self-governing profession, we have the collective wisdom—if we genuinely involve our membership—to identify what we need to do to ensure we are a profession recognized and esteemed by the public. [e](#)

Patrick Quinn, PhD, P.Eng., C.Eng., FEC, has made a leadership contribution to every progressive change issue in engineering regulation for the last 40 years. Roydon Fraser, PhD, P.Eng., FEC, is a professor of mechanical and mechatronics engineering at the University of Waterloo and a nine-time-elected past PEO councillor. Stephen Armstrong, P.Eng., C.Eng., is founder of AMGI Certified Management Consultants and a professor of innovation at the University of Toronto faculty of applied science and engineering.

SUMMARY OF DECISION AND REASONS

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

This Discipline Committee hearing took place on October 30, 2019, and the panel issued its decisions and reasons on January 15, 2020. The panel met again on February 24, 2020, to consider penalty and issued a decision on penalty and costs on June 10, 2020. Counsel for the association was Leah Price, and counsel for Mr. Buchanan was Harp Khukh.

AGREED FACTS AND ALLEGATIONS

The allegations against Rudolph Buchanan, P.Eng., were set out in the Statement of Allegations dated November 27, 2018, and Buchanan admitted to the facts and allegations as follows:

- 1) Rudolph G. Buchanan, P.Eng. (Buchanan), is a licensed engineer with PEO since 1981. At the time of the events described below, he did not hold a certificate of authorization.
- 2) In or about October 2011, architect J. William Birdsell (Birdsell) verbally retained Buchanan to review structural drawings for a proposed 175 m² extension to an industrial building (the Building) located at 137 Arrow Road in Guelph (the Extension Project). The Extension Project was a steel-framed extension that was higher in height than the original Building.
- 3) Buchanan signed and sealed four structural drawings intended for submission in an application for building permit to the City of Guelph (the City). Buchanan signed and sealed the following documents (the Sealed Drawings), all dated October 17, 2011:
 - a) S-1 (Foundation Plan);
 - b) S-2 (Found. Section);
 - c) S-3 (Roof Structure Plan); and
 - d) S-4 (Structural Notes).

Attached as Schedule “A” hereto are (reduced) copies of the Sealed Drawings.
- 4) Buchanan’s engineering education focused on mechanical engineering. At the material time, he had no experience in building structural design or building structural analysis.
- 5) Birdsell prepared the Sealed Drawings. Buchanan signed and sealed the Sealed Drawings relying on Birdsell, without doing any structural review or calculations to determine structural adequacy.
- 6) Between October 2011 and April 2013, Vittorio Torchia from 1090453 Ontario Inc. (Torchia), the owner of the Building, constructed the Extension Project without obtaining a building permit. The extension was constructed based on shop drawings that the supplier of the steel-framing completed in 2012, not on the Sealed Drawings.
- 7) The City discovered that Torchia had constructed the Extension Project without a permit and required that proper documents be filed. Torchia retained Tacoma Engineers (Tacoma) to prepare documents for the building permit. Tacoma conducted a review of the building design as part of their work and discovered numerous structural deficiencies in the Sealed Drawings.
- 8) Tacoma also noted that the general notes contained in one of the Sealed Drawings (S-4) (which was prepared prior to Tacoma’s retainer), included reference to Tacoma and its telephone number, such that Tacoma suspected that Buchanan had used general notes from another project in which Tacoma was involved. As Buchanan did not review the Sealed Drawings, he failed to note or correct the reference to Tacoma.
- 9) As a result, Steve Adema, P.Eng., an engineer at Tacoma, filed the Complaint, Attached as Schedule “B,” is a copy of the Complaint without attachments.
- 10) PEO retained Daria Khachi, P.Eng., as an independent expert to review the design of the Extension Project. Mr. Khachi provided a report dated August 20, 2018 (the Expert Report), in which he opined that the Sealed Drawings contained errors, omissions and deficiencies, including:
 - a) The metal roof deck specified in the Sealed Drawings was inadequate;

- b) A support column was not large enough (although the extension was built according to the steel supplier’s shop drawings, which shows a larger column at that location);
 - c) The foundation plan drawings did not accurately show the pit depression and the walls required to support the perimeter of a 710mm deep pit; and
 - d) The proposed roof to the extension was approximately 3.1m taller than the existing building roof, which created substantial snow accumulation on the low [existing] roof. This accumulation would cause overstressing of roof joists by gridline 9, two roof beams between grids 7 and 9, and the end span of the roof deck by gridline 9 (the structural snow accumulation issue). The overstressing would result in member failure. The structural snow accumulation issue was contrary to the minimum design loads and standards set out in the Ontario Building Code, as well as other codes and standards that are necessary for the design of structures, attached as Schedule “C” is a copy of the Expert Report (attachment omitted).
- 11) For the purposes of this proceeding, Buchanan accepts as correct the findings, opinions and conclusions contained in the Expert Report. Buchanan admits that he failed to meet the minimum acceptable standard for engineering, and that he failed to maintain the standards that a reasonable and prudent practitioner would maintain in the circumstances.

PLEA BY THE MEMBER

The member pled guilty to all of the allegations of professional misconduct as were set out in the Agreed Statement of Facts. The panel conducted a plea inquiry of the member and was satisfied that the member’s plea was voluntary, informed and unequivocal.

DECISION

The panel considered the Agreed Statement of Facts and the guilty plea of the member. The panel found

the member guilty of professional misconduct under section 28(2)(b) of the act and its Regulation 941.

The hearing was adjourned to February 24, 2020, to address the issue of penalty.

DECISION AND REASON

The panel considered the Agreed Statement of Facts and finds that the facts support a finding of professional misconduct and, in particular, finds that Rudolph G. Buchanan, P.Eng., a member of the Association of Professional Engineers of Ontario, committed an act of professional misconduct as alleged in paragraphs 12 a., b., c., d., e., f., and g. of the Agreed Statement of Facts.

ADJOURNMENT ON THE ISSUE OF PENALTY

The parties explained that an independent expert had been jointly retained by PEO and the member. They sought an adjournment to February 24, 2020, in order to have an opportunity to receive and consider a report. The purpose of considering the report was to arrive at a joint submission on penalty.

DECISION ON THE REQUEST TO ADJOURN ON PENALTY

The panel considered the request for the adjournment. The panel was mindful of the fact that the request was being made on consent of both the association and the member. The panel was at the same time concerned about the fact that a finding of misconduct had been made and considered whether it was appropriate in all of the circumstances to delay the imposition of the penalty.

The association submitted that it was their belief that the adjournment would result in a joint submission on penalty, although it could not guarantee that. The issue of peer review was discussed. The expert report was expected to be of assistance in determining the appropriate scope of a peer review. The independent, jointly retained expert was to review projects completed by the member beyond the one that was the subject of the allegations before the panel. The panel requested submissions from the parties regarding the nature of the work he was doing and regarding how the review by the independent, jointly retained expert was progressing.

The parties added to additional agreed facts:

1. The work that the expert had reviewed to date was safe and did not pose a risk to the public;
2. The work the member is currently doing is not the same as the work that is the subject of the complaint.

The panel granted the adjournment.

PENALTY DECISION

The panel accepted the Joint Submission as to Penalty and, accordingly, orders:

1. Pursuant to s. 28(4)(f) of the *Professional Engineers Act*, Buchanan shall be reprimanded, and the fact of the reprimand shall be recorded on the register permanently;
2. Pursuant to s. 28(4)(b) of the *Professional Engineers Act*, Buchanan's licence shall be suspended for a period of two (2) weeks, commencing on March 2, 2020;
3. The finding and order of the Discipline Committee shall be published in summary form under s. 28(4)(i) and s. 28(5) of the *Professional Engineers Act*, together with the name of the member;
4. Pursuant to s. 28(4)(d) and s. 28(4)(e) of the *Professional Engineers Act*, there shall be a term, condition and restriction on Buchanan's licence prohibiting him from practising structural engineering. It is understood and agreed that the member's current work for Progressive Industrial Millwright Limited in connection with the preparation of unsealed fabrication and detail drawings (Shop Drawings) for small steel structures such as: platforms not larger than two hundred (200) square feet in area and ten (10) feet in height, and stairs spanning no more than two (2) storeys; does not constitute the practice of structural engineering. In preparing the Shop Drawings, the member shall not assume responsibility for any design elements, which includes, but is not limited to load requirements, welding requirements, connections or components; and
5. There shall be no order as to costs.

REASON FOR PENALTY DECISION

The panel concluded that the proposed penalty is reasonable and in the public interest. Rudolph G. Buchanan, the member, has co-operated with the association. With respect to the order for costs, by agreeing to the facts and a proposed penalty, the member has accepted responsibility for his actions and has avoided unnecessary expense to the association. With respect to the remaining aspects of the penalty, the panel agrees generally with the submissions of counsel for the association and notes, in particular, that the member agreed voluntarily and, as part of the process of determining what the penalty would be, to undergo a practice review. He accepted that he should not have done work in the area of structural engineering. He regretted having done so. He agreed with having a permanent restriction on practising structural engineering, which would prevent him from sealing a drawing for the design of structures as described at paragraph 4 above. The panel considered whether there was any aspect of the penalty that would justify varying from the joint submission made by the parties. The panel found that there was nothing about the joint submission that justified varying from it. The panel was satisfied that the penalty proposed by the parties did meet all of the elements required of it, and so ordered.

Ishwar Bhatia, P.Eng., signed this Decision and Reasons for the decision as chair of this discipline panel and on behalf of the members of the discipline panel: Kathleen Robichaud, LLB, Michael Rosenblitt, P.Eng., Virendra Sahni, P.Eng., and Anthony Warner, P.Eng.

PEO PUBLICATIONS AND RESOURCES

Professional Engineers Ontario has a number of resources, including practice bulletins, brochures, learning modules and fact sheets, available for free on its website at peo.on.ca/knowledge-centre. The following regulatory documents and practice guidelines are available in PDF form on PEO's website.

REGULATORY DOCUMENTS

- The *Professional Engineers Act*, R.S.O. 1990, Chapter P.28
- Ontario Regulation 260/08
- Ontario Regulation 941/90
- By-Law No. 1

PRACTICE GUIDELINES

General—Engineer

- Assuming Responsibility and Supervising Engineering Work Guideline (2018)
- Conducting a Practice Review (2014)
- Guideline on Human Rights in Professional Practice (2009)
- Preparing As-Built and Record Documents Guideline (2020)
- Professional Engineering Practice (2017)
- Professional Engineers Reviewing Work Prepared by Another Professional Engineer (2011)

Use of seal

- Use of Professional Engineer's Seal (2008)

Legal/Discipline

- Guideline on Forensic Engineering Investigations (2016)
- Making a Complaint: A Public Information Guide (2011)
- The Professional Engineer as an Expert Witness (2011)

Communications

- Professional Engineers Providing Communication Services (1993)

Construction/Building

- Design Evaluation & Field Review of Demountable Event & Related Structures Guideline (2020)
- Professional Engineers Providing Commissioning Work in Buildings (1992)
- Professional Engineers Providing General Review of Construction as Required by the Ontario Building Code (Rev. 2008)
- Professional Engineers Providing Land Development/Redevelopment Engineering Services (1994)
- Professional Engineers Providing Mechanical and Electrical Engineering Services In Buildings (1997)
- Professional Engineers Providing Professional Services in Building Projects using Manufacturer-Designed Systems and Components (1999)
- Professional Engineers Providing Services for Demolition of Buildings and Other Structures (2011)
- Professional Engineers—Temporary Works (1993)
- Structural Condition Assessments of Existing Buildings and Designated Structures (2016)
- Structural Engineering Design Services for Buildings Guideline (2016)

Transport/Roads/Municipal

- Professional Engineers Providing Services for Municipalities (Rev. 1998)
- Professional Engineers Providing Services in Transportation and Traffic Engineering (1994)
- Professional Engineers Providing Services with Respect to Road, Bridges, and Associated Facilities (1995)

Software/Computers

- Developing Software for Safety Critical Engineering Applications (2013)
- Professional Engineers Using Software-Based Engineering Tools (2011)

Mechanical/Electrical/Industrial

- Professional Engineers Providing Reports for Pre-Start Health and Safety Reviews (2001)

Geotechnical/Environmental

- Engineering Evaluation Reports For Drinking Water Systems (2014)
- Professional Engineers Providing Acoustical Engineering Services in Land-Use Planning (Rev. 1998)
- Professional Engineers Providing Geotechnical Engineering Services (1993)
- Professional Engineers Providing Reports on Mineral Properties (2002)
- Environmental Site Assessment, Remediation and Management Guideline (2020)
- Services of the Engineer Acting Under the Drainage Act (1998)
- Solid Waste Management (2017)

National Guidelines

- Principles of Climate Change Adaptation for Engineers
- Guideline on Sustainable Development and Environmental Stewardship for Professional Engineers (2016)

PEO'S BIG TENT

The emerging disciplines
conundrum

By Marika Bigongiari



From artificial intelligence to big data, new and innovative fields of engineering with the clear potential to impact public safety have been emerging at breakneck speed for years. But regulating emerging disciplines is a complex issue. Some engineers think it's not a question of whether PEO should regulate these fields but of when and how to go about it, and yet most agree the current system can't accommodate a bigger tent. We talk to engineers who share their opinions on how PEO might get there.



Some engineers believe emerging disciplines belong under PEO's regulatory umbrella by virtue of how professional engineering is defined under the *Professional Engineers Act (PEA)*: "any act of planning, designing, composing, evaluating, advising, reporting, directing or supervising that requires the application of engineering principles and concerns the safeguarding of life, health, property, economic interests, the public welfare or the environment or the managing of any such act." It is a definition so broad that it easily encompasses many newer areas of practice that are emerging as science, technology and engineering evolve. Although many insist that increasing PEO's reach supports its mandate to protect the public interest, others think this would be overstepping or risks stifling innovation. There are many factors to consider, including proposed changes to PEO's current admissions and licensing processes and even amending the PEA.

In her inaugural speech at PEO's annual general meeting in May, PEO President Marisa Sterling, P.Eng., FEC, called for a reimagining of PEO and identified an opportunity for meaningful change, including how it can better protect the public. Recently, PEO embarked on a path towards transformational change in the wake of a review of its regulatory performance by United Kingdom-based consultant Harry Cayton, who levied 15 recommendations that flagged key areas for improvement. The organization began by approving an operational

action plan to address the review's recommendations and a Governance Roadmap to strengthen Council's effectiveness—the first steps in a multi-year project. Sterling noted PEO's transformation as an opportunity to dramatically increase the impact of engineering regulation in Ontario and pondered where it might lead: "We are witnessing how the lines between the digital, the biological and the physical worlds are colliding and reinventing themselves in many different ways. Artificial intelligence, computer vision and nanotechnology have created machines that can increasingly 'see,' learn and act in ways that are transforming our world. A self-driving car, a smart device, a way to correct our DNA—all are impacting peoples' lives, privacy and health. Could the scope of PEO's licensing reach further into these fields of work to safeguard the public?"

FIRST THINGS FIRST

Former PEO president David Brown, P.Eng., BDS, FEC, asserts that PEO has a significant amount of housekeeping to do before it can consider enlarging its tent of responsibility. During his tenure as PEO president in 2018–2019, much of Brown's formal messaging centred on the need for PEO to "get its house in order," which meant setting the wheels in motion to put the organization on a path of change and modernization. As president, Brown engaged Cayton to conduct his review and insists that addressing his recommendations must be PEO's first order of business. "Right now, PEO essentially operates a small tent," says Brown, who is a senior partner (retired) at TaskForce Engineering Inc., a construction and structural engineering firm he co-founded in Belleville, ON. Brown explains that generally it's the engineers working in traditional disciplines who make up the small tent PEO currently works to regulate—something he says the regulator must master before thinking about the "big tent" of emerging disciplines. "The Cayton report made it clear that we have a lot of work to do," he observes. "And until we get better at that, looking at the big tent of emerging disciplines is a pipe dream."

From a business perspective, Brown also points out that PEO can't tackle emerging disciplines without a lot more money and resources to pursue everyone who is practising professional engineering as it is currently defined under the act. "We would have to kick out all the tenants and use all eight floors of our building and hire staff to chase after people doing professional engineering between the cracks and either get them licensed or enforce against them," he says. Membership fees are another area to consider. "There is no doubt,

the cost to pursue and license anyone practising engineering in this province will be significant, so it stands to reason fees will increase," Brown says. He predicts there will be a tipping point where many licensees who don't need a licence decide the fees are no longer worth paying. He suggests that an alternative PEO could consider is to institute higher fees for those who need a stamp and lower fees for those who are interested in title alone.

Brown points out that engineering schools across the province are churning out entrepreneurs who have developed technology that clearly meets the definition of professional engineering but who largely choose not to become licensed. He asserts that regulating the engineering work those graduates are doing under the PEA as it stands is an obligation PEO has but is not able to fulfill, but he also thinks the definition of professional engineering in the PEA needs to be modified because it's too broad. "People think we have to go after emerging disciplines, and when I ask why, the answer is, 'Because our act tells us; it's in our definition.' And I say, 'Precisely, but maybe that needs to be updated.' Maybe we have to step back and ask, 'Is our definition of professional engineering in the act relevant given advancements in technology?'" If, after PEO addresses the recommendations of Cayton's report, the Ontario government decides it wants to work with the organization under modern governance principles to mitigate risk, Brown thinks PEO could offer a value proposition for emerging disciplines to be licensed. But he cautions that to do so prematurely would stifle innovation or drive it out of the province. Brown thinks PEO can become a leader in engineering regulation—and as the biggest engineering regulator in Canada, he thinks it should be.

ADDING VALUE TO THE LICENCE

When it comes to regulation, Roydon Fraser, PhD, P.Eng., FEC, thinks PEO should be blazing a trail, too—especially given the organization's official vision to be the trusted leader in professional self-regulation. "That statement immediately tells someone who wants to get licensed that they're going to be a leader. It has a positive spin to it," says Fraser, a professor of mechanical and mechatronics engineering at the University of Waterloo, former PEO councillor and long-time volunteer. He would like to see PEO think about including emerging disciplines, but not the way he sees it regulating today. First, PEO must add value to the P.Eng. licence, he asserts—not only if PEO is to consider pursuing emerging disciplines but for



the organization's long-term relevancy. Fraser has some innovative ideas when it comes to evolving PEO's licensing model to add value and encourage more to become licensed, and his suggestions naturally lend themselves to welcoming emerging disciplines into the mix.

A tool PEO could use to encourage more engineering graduates to pursue licensure, Fraser suggests, is gamification. He offers an example that is used with the University of Waterloo Alternative Fuels Team (UWAF), which consists of about 100 students under his supervision. The UWAF designs and builds cars they can drive on the road, so safety is important. "These electric-hybrid vehicles power batteries that are 350 to 400 volts, 200 amps. If you touch it, and there's a short on it, you're dead," Fraser says. He encouraged UWAF to implement a student's suggestion for a way to get team members to sign up for voluntary safety training. "If you gamify it, it becomes something people want to do," Fraser explains. "What we did is, we said we have four levels of safety—one, two, three, four—from where you can turn a wrench to where you can drive the car." He explains that everyone knows what level every-

one is at, so it's pure peer pressure: "I'm Level 1; you're a Level 2—how'd you get to be Level 2?" "Well, I took this training and did this." All of a sudden, I have people asking me, and asking the students, "When's the next safety training?" How many people do that? Do you think people at PEO go around and say, "When's the next safety training?" I'm not saying you can do that in every environment and every situation, but by using the philosophy of making it something that people want because there's value to it, you're generating a type of value that they recognize and appreciate."

If PEO wants to address the issue of entrepreneurs in emerging disciplines, Fraser says it must understand the valley of death—which refers to the critical first few years of a new business—and accommodate it because the current processes in place will not. "You can't bring the emerging disciplines in without changing the regulations," Fraser says. "There has to be this fundamental change regarding what PEO's purpose is. Is it the visionary? Is it a self-regulatory world leader? Or is just there to give out licences?"

CHOOSING THE LICENCE

So, why would an individual in an emerging discipline choose to pursue licensure? Jesse Thé, PhD, P.Eng., is an adjunct professor of mechanical and mechatronics engineering at the University of Waterloo. He's also an entrepreneur who founded two companies: Lakes Environmental, which provides environmental software, including emissions inventory and air dispersion; and Tauria, which facilitates end-to-end encrypted business communications. Thé's work is focused on scientific software in the air pollution and environment sphere, deep neural networks and artificial intelligence. It was important to him to become licensed. First, he wants to lead by example. "I would like the students to get licensed," he offers, "to show them they have an entity to evaluate their competence and to show others that they have the minimum requirements to work in the field." Thé also believes in professional accountability and wants the people he works with to be able to trust that he has met stringent criteria for competency in the work he does. And he recognizes the potential impact of that work. "I make decisions on what level is clean enough for a certain pollutant or regarding modifications on an industrial process that will reduce exposure of the public or employees to hazardous air. I wanted to give that assurance to people that I have the minimum competency to do the work, even though it [may not be] required of me," he explains. Thé is not concerned about the possibility of his business being stifled through regulation—although he recognizes it's a potential danger. "It's difficult because any association has the potential to overregulate," he warns. "So yes, it's a risk we run. We need to have enough regulation but not beyond that, because then you stifle everything."

Thé raises a key point: namely, that newer areas of engineering, such as artificial intelligence, will soon become inextricably woven into traditional engineering fields. "In five to 10 years, engineers who don't know anything about deep neural networks or machine learning will be like an engineer in the 1990s not knowing anything about mathematics because it will dominate so substantially all the fields in engineering," he observes. When it comes to comparing emerging engineering fields with established fields in areas such as the natural sciences, the lines are often blurred. Although it's out of scope for PEO to license biologists, Thé points out that we've gotten to the point where environmental engineers are covering areas that used to be exclusive to biologists. "These are new engineering fields," he says. The first step in deter-

mining whether these areas should be regulated is analyzing the recommendations the engineers need to make. If there's a chance a recommendation could cause harm, Thé suggests licensing might be necessary.

A LONGSTANDING DEBATE

The debate surrounding emerging disciplines is not new, in fact, PEO's Emerging Disciplines Task Force (EDTF) was formed in 2008. In March, the task force submitted a report to Council that summarized its work, which focused on communications infrastructure engineering (CIE) and included a stakeholder consultation, an outline of CIE scopes of practice and identifying CIE practitioners, along with several recommendations, including considerations for the licensing of CIE practitioners, enhancing engineering curricula at accredited schools and future steps. At its March meeting, Council stood down the EDTF and tasked the Executive Committee to consider the EDTF report in conjunction with their work on the Governance Roadmap and the Succession Planning Task Force recommendations.

As long-time chair of the EDTF and former PEO president, Peter M. DeVita, P.Eng., FEC, has been entrenched in studying how emerging disciplines fit into PEO since well before the task force was formed. Engineering is unique, he explains, in that the scope of engineering practice continues to expand with new science and technology, and this adds to the complexity of considering new disciplines through the lens of regulation. "Every time we invent something new, we create a new practice. And the problem is as you expand the scope wider and wider, it gets very difficult for a single regulating body to license the entire breadth of practice and do a good job," DeVita points out. "It comes down to serving and protecting the public interest...If you want to do something that is potentially dangerous and impact the public, you need to be competent—and we need to have somebody say that you are competent." DeVita says that emerging disciplines are the tip of the iceberg: "They are the prototype for the profession to examine and come to terms with what a licence to practise really is." **e**

COUNCIL CONSIDERS MEMBER SUBMISSIONS FROM 2020 AGM

By Nicole Axworthy

536TH MEETING, SEPTEMBER 25, 2020

At its September meeting, Council reviewed approved member submissions from PEO's 2020 Annual General Meeting in May (see AGM Minutes, p. 38). All submissions that were voted in favor by members at the AGM are first reviewed by staff before being forwarded to Council. The first submission dealt with ISO 9001:2015 certification, and the staff recommendation to Council was to leave the decision regarding certification to the CEO/registrar. Staff determined that the best course of action is to establish a corporate policy stating PEO will eventually obtain ISO 9001 certification so that future policies are assessed to ensure they are ISO 9001 compliant.

Another AGM submission suggested that PEO host regional town hall meetings to discuss the future of engineering. Staff reviewed the submission and recommended that doing so is not appropriate at this time because PEO is currently occupied with the implementation of the action plan resulting from the external regulatory review as well as other ongoing initiatives related to governance and restructuring.

Another AGM submission suggested PEO supply digital seals for licence holders. The staff recommendation was that PEO join the Notarius program to give PEO licence holders the opportunity to subscribe to the digital certification service on a voluntary basis. Council approved the recommendation and directed the CEO/registrar to take steps necessary to implement it, including communicating this action to all PEO licence holders (see "PEO adopts Notarius digital signature for member use," p. 9).

BYLAW CHANGE

Council approved a bylaw change that relates to a Council decision made in March to discontinue the PEO-administered, paper-based Professional Practice Exam and join the Association of Professional Engineers and Geoscientists of Alberta (APEGA)-administered, computer-based National Professional Practice Exam (NPPE) program (see In Council, *Engineering Dimensions*, May/June 2020, p. 50). To implement the decision, Council was asked to approve an amendment to section 39(22)(a) of By-Law No. 1, so that it refers to "National Professional Practice Examination or equivalent examination" and includes an update to the exam fees as per the agreement with APEGA. PEO will increase the NPPE fee to \$225.50 as of November 1, 2020, and each November following the fee will increase to the amounts specified in the amended bylaw.

LICENSURE MODEL UPDATE

A motion, prepared by Tapan Das, PhD, P.Eng., FEC, Joe Podrebarac, P.Eng., PMP, FEC, and Ray Barton, PhD, was put forward that relates to updating PEO's licensure model to be inclusive and accommodating when it comes to experience requirements for self-employed engineering graduates and PEO applicants who are entrepreneurs. Currently, PEO requires an applicant to work under a Canadian-licensed P.Eng. supervisor for a minimum of one year in Canada to qualify for licensure, yet, according to the motion's authors, many self-employed engineers are not able to meet this requirement.

The motion that was put forward asked that PEO staff investigate and report back to Council by January 2021 "the extent of engineering graduates who become entrepreneurs or self-employed in Ontario and alternative pathways to the experience requirements that do not require a minimum of one year of supervision by a P.Eng." Council had a full discussion on changing the language in the motion and the possibility of referring the motion to the Licensing Committee and the Experience Requirements Committee. However, Council ultimately approved the motion with additional wording to include engineering graduates who are working in disciplines without P.Eng. supervision.

PEO SKILLS AND ATTRIBUTES MATRIX

Council approved a PEO Skills and Attributes Matrix, which aims to identify any gaps in the competencies and attributes of current Council members, and specifically to help guide the Public Appointments Secretariat of the Ontario Government in their selection of lieutenant governor-in-council appointees (LGAs) on Council. PEO does not currently have a competencies framework for councillor selection in place, so showing any gaps in this area could be helpful for future appointments of LGAs and/or PEO elections.

The approved Skills and Attributes Matrix will be populated with the skills and attributes profile of the current Council with the identification of profile gaps, which will be sent to the Public Appointments Secretariat's office for their reference when selecting new LGAs for PEO. The matrix will be updated on a yearly basis with each new Council elected.

CREATION OF AN ANTI-RACISM COMMITTEE

A motion was put forward asking Council to authorize the creation of a Racial Equity Monitoring Committee to study any elements of racism or discrimination within the profession and to propose appropriate remedies. Councillor discussion consisted of whether there was a need to identify the problem before coming up with potential solutions; if this should be a responsibility of the Ontario Society of Professional Engineers; and if there was instead a need to restructure PEO's Equity and Diversity Committee. Ultimately, Council voted to postpone the motion until the November Council meeting and tasked the CEO/registrar to work with the motion's mover, Peter Cushman, P.Eng., and seconder, Lisa MacCumber, P.Eng., FEC, and staff to investigate the problem of racism and racial inequity in PEO's culture and operations and come back to Council with a recommendation on how to proceed. [e](#)

IN MEMORIAM

THE ASSOCIATION HAS RECEIVED WITH REGRET NOTIFICATION OF THE DEATHS OF THE FOLLOWING MEMBERS
(AS OF SEPTEMBER 2020).

ABUSHAWASHI, Salem Ammar
Edmonton, AB

AISHFORD, Ross George
Toronto, ON

APLIN, Kenneth Frank
St Catharines, ON

BLACKWELL, Garston Hugh
Kingston, ON

BLAIKLOCK, George
Edward James
Wellington, ON

BOONE, Alan Charles Roy
Ottawa, ON

BOUTTELL, Frederick Hubert
New Dundee, ON

BOYD, Frederick Charles
Burlington, ON

BRABBS, Roland John
Ottawa, ON

BRZUSTOWSKI, Thomas Anthony
Waterloo, ON

BURCHELL, Fred George
Sudbury, ON

BUTLER, John Charles
Burlington, ON

CALDER, Douglas Melvin
Midland, ON

CHARRON, Joseph Michel
Gatineau, QC

CHU, David Yen-Hing
Scarborough, ON

COVE, John Terence
Goderich, ON

DAMP, Stephen Peter
Caledon Village, ON

DUIGENAN, John Joseph
Crysler, ON

DYE, Robert George
Georgetown, ON

EDWARDSON, Kevin James
Belleville, ON

FARMAR, Donald Grant
Peterborough, ON

FLOOD, Hugh Wilfrid
Waterloo, ON

GIBSON, Donald Fredrick Charles
Sudbury, ON

GIBSON, Robert Donald
Owen Sound, ON

GOODGER, David
Dundas, ON

GRIGNON, Adelard Edmond
Kingsville, ON

GYALOKAY, Aristide Michael
North York, ON

HARASTI, Thomas Francis
North York, ON

HINSE, Guy J.
Virginiatown, ON

HOANG, Quoc Thinh
Toronto, ON

HOPKINS, John Leighton
Toronto, ON

HOWARTH, Barry Arthur
Nepean, ON

HUCALUK, Fred K.
Scarborough, ON

JANIK, Zbigniew Jan
London, ON

JAQUES, Henry Stewart
Ottawa, ON

JOHNSON, John Henry
Saint John, NB

JUNKIN, John Charles
Toronto, ON

KALU, Egwuonwu Ukoha
Etobicoke, ON

KEELAN, Bryan Gerard
Peterborough, ON

KOCSIS, Sandor Alex Jozsef
Ottawa, ON

KUMAHARA, Tetsuo
Scarborough, ON

KWAN, Andrew Shek-Ming
Vancouver, BC

LABONTE, Joseph Germain Gerard
Mississauga, ON

LAGADIN, John
Calgary, AB

LAMOUREUX, Marcel Ronald
Orillia, ON

LEITCH, John Douglas
Newmarket, ON

LEW, Stanley
Greenville, SC

LIU, Canus Kwan Ming
Mississauga, ON

LIU, Chen-Kwong
North York, ON

LUMLEY, Mervin Harold
Toronto, ON

MACKELLAR, James Cameron
Toronto, ON

MACKIE, Alexander
London, ON

MANN, George Leslie
Kitchener, ON

MARK, Robert
Sudbury, ON

MATUSCH, Stephan Frank
Sudbury, ON

MCGINN, Ralph Wayne
Surrey, BC

MCGUINNESS, Leo B.
North York, ON

MEACOCK, Philip John
Parksville, BC

MEERSON, Boris
Toronto, ON

MOOREHEAD, Thomas John
Cambridge, ON

MORGULIS, Isaac Allan
Toronto, ON

MORTON, Edwin Harold
Orleans, ON

MURRANT, Melvin Roy
Dunrobin, ON

NEILPOVITZ, William David
Thunder Bay, ON

NICHOLLS, James Gordon
South Porcupine, ON

NICHOLLS, Jerome Charles
Sudbury, ON

**O'CALLAGHAN, Richard
Thomas**
Mississauga, ON

O'REGAN, Joseph Barry
Gloucester, ON

OGILVIE, John Robert
Guelph, ON

PANJER, Sean Paul
Woodstock, ON

PERCY, Ivan Clifford
Kanata, ON

POHORLY, Joseph Edward
Virgil, ON

PRINGLE, Michael John
Ottawa, ON

RAINA, Vijay Mohan
Thornhill, ON

RIVEST, Victor Pierre
Leamington, ON

ROBBINS, Jack Arthur
Blue Mountains, ON

ROBERMAN, Valery
Toronto, ON

ROMANETZ, Robert John
Winnipeg, MB

RUSAN, Radu
North York, ON

SAAR, Ylo Mark
Lakefield, ON

SAUNDERS, Ira Martin
Orleans, ON

SHARP, Bruce Andrew
Moffat, ON

SOLMAN, James John
Scarborough, ON

STEPHENSON, John Paul
Richmond Hill, ON

STEVENSON, Robert Lorne
Kingston, ON

SWEET, William Robert
Vernon, BC

THOMAS, Gerald Francis
Mississauga, ON

TO, James C.Y.
Scarborough, ON

**WITHERSPOON, David
Franklin**
Long Sault, ON

XIGGOROS, George
Pickering, ON



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MINUTES OF THE 98TH ANNUAL BUSINESS MEETING

SATURDAY, MAY 30, 2020

PRESIDENT AND CHAIR: NANCY HILL, P.ENG., LLB, FEC, FCAE

The 98th Annual General Meeting of Professional Engineers Ontario was held via videoconference on Saturday, May 30, 2020. President Nancy Hill advised that PEO was conducting the annual general meeting virtually due to coronavirus restrictions. Question submission processes and electronic voting instructions were reviewed. President Hill announced that the 534th meeting of PEO Council would be held following the annual general meeting at 2 p.m. on Saturday, May 30, 2020.

CALL TO ORDER

President Hill 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.

INTRODUCTION OF COUNCIL

President Hill introduced the members of the 2019–2020 PEO Council: Nancy Hill, B.A.Sc., P.Eng., LLB, FEC, FCAE, president; Marisa Sterling, P.Eng., FEC, president-elect; David Brown, P.Eng., BDS, C.E.T., FEC, past president; Christian Bellini, P.Eng., FEC, vice president (elected); Iretomiwa Olukiyesi, P.Eng., vice president (appointed), lieutenant governor-in-council appointee; Sandra Ausma, PhD, P.Eng., councillor-at-large; Leila Notash, PhD, P.Eng., FEC, councillor-at-large; Gregory Wowchuk, P.Eng., councillor-at-large; Guy Boone, P.Eng., FEC, Eastern Region councillor; Randy Walker, P.Eng., FEC, Eastern Region councillor; Keivan Torabi, PhD, P.Eng., East Central Region councillor; Arthur Sinclair, P.Eng., East Central Region councillor; Serge Robert, P.Eng., FEC, Northern Region councillor; Ramesh Subramanian, PhD, P.Eng., FEC, Northern Region councillor; Gary Houghton, P.Eng., FEC, Western Region councillor; Wayne Kershaw, P.Eng., FEC, Western Region councillor; Warren Turnbull, P.Eng., FEC, West Central Region councillor; Lisa MacCumber, P.Eng., FEC, West Central Region councillor; Arjan Arenja, MBA, P.Eng., lieutenant governor-in-council appointee; Robert Brunet, P.Eng., lieutenant governor-in-council appointee; Todd Bruyere, P.Eng., lieutenant governor-in-council appointee; Lorne Cutler, MBA, P.Eng., lieutenant governor-in-council appointee; Andy Dryland, C.E.T., lieutenant governor-in-council appointee; Qadira C. Jackson Kouakou, BA, BSW, LLB, lieutenant governor-in-council appointee; and Sherlock Sung, lieutenant governor-in-council appointee.

President Hill also acknowledged the following members of the 2019–2020 Council, who transitioned from Council prior to the conclusion of the term: Vajahat Bandy, P.Eng., Tim Kirkby, P.Eng., C.E.T., FEC, Lew Lederman, QC, Nadine Rush, C.E.T., and Marilyn Spink, P.Eng. President Hill thanked PEO's directors to Engineers Canada for 2019–2020: Annette Bergeron, P.Eng., FEC, Christian Bellini, Danny Chui, P.Eng., FEC, Kelly Reid, P.Eng., IACCM CCMP, and Changiz Sadr, P.Eng., FEC.

IN MEMORIAM

President Hill asked that all present observe a moment of silence in remembrance of those PEO members who passed away in 2019.

ORDER OF BUSINESS

President Hill reviewed the order of business. A test of the voting system was conducted.

ADOPTION OF MINUTES

President Hill referred members to the minutes of the 2019 AGM. It was moved by Arthur Sinclair, seconded by Wayne Kershaw, that the minutes of the 2019 AGM, as published in the November/December 2019 issue of *Engineering Dimensions* and as distributed at the meeting, be adopted as presented.

Motion carried

BUSINESS ARISING FROM THE MINUTES

President Hill reviewed the actions taken by Council on submissions discussed at the 2019 AGM. Members made seven submissions to the meeting, four of which were passed.

The first submission requested that PEO Council form a task force to assess and report on barriers for licensure in emerging/non-traditional disciplines and develop an equitable and sustainable process for EITs and international engineering graduates to satisfy the Canadian work experience requirement.

The second submission requested that PEO Council create a task force to explore the implications of the accelerating pace of technological change and new scientific discoveries on the regulation, licensing and governing of engineers and applied scientists in Ontario. Council voted to refer both submissions to the registrar for consideration when addressing the recommendations from the external regulatory performance review. Work on these items was ongoing.

The third submission requested that PEO allow EITs to vote in PEO Council elections beginning in the calendar year 2019 or in the calendar year as soon thereafter as can be implemented, and in all subsequent Council elections. Council had a fulsome discussion on this motion but found the wording, as submitted, to be challenging. Attempts to modify the motion were defeated. Ultimately, the original motion was withdrawn with the expectation that it would be updated and brought back to a future meeting, which had yet to occur.

The fourth submission requested that Council approve a change of the 36 generic chapter email addresses that were an “alias” address to a PEO webmail account and provide the password to the relevant chapter chairs. After some deliberation, this submission was voted on and defeated.

FINANCIAL REPORT

The president referred members to the auditor’s report and financial statements, which were published on the PEO website prior to the meeting and published in the May/June 2020 issue of *Engineering Dimensions*. President Hill advised that an abbreviated version of the statements appeared in the 2019 annual review. President Hill also highlighted the questions and answers available within the PEO operations booklet and on the PEO website, which address common questions on PEO operations.

Councillor Guy Boone, chair of the Audit Committee, reviewed the financial information, noting a \$2.9 million surplus at fiscal year-end. Councillor Boone stated that the surplus was the result of an increase in membership fees commensurate with inflation; growth in the number of professional engineers, certificate of authorization holders, and EITs; superior performance of investments; and lower expenses due to staff vacancies and other operational savings.

The floor was opened for questions and comments from licence holders.

Responding to a query regarding how many people were logged in to the meeting, Manager, Secretariat Ralph Martin reported that 443 people were in attendance, representing quorum.

A licence holder inquired regarding PEO’s plans for use of the surplus to improve enforcement and other PEO priorities. President Hill advised that PEO’s priorities were the action plan to address the 15 recommendations arising from the regulatory performance review and governance renewal. CEO/Registrar Johnny Zuccon, P.Eng., FEC, also reported that the organization’s structure was being rebuilt, staff vacancies were being filled, and investments in digital platforms were being made.

There was a further query regarding whether a similar surplus was foreseen for the 2020 fiscal year and President Hill stated that, given planned activities, a surplus of that size was not anticipated.

Responding to a query regarding whether other provincial organizations had bodies similar to the Ontario Society of Professional Engineers (OSPE), President Hill reported that that was generally not the case, however, many were investigating different models.

An explanation was requested regarding the rise in total expenses. Director of Finance Chetan Mehta stated that, while there was a reduction in core operational activities, the addition of Council special expenditures caused a marginal expense increase of approximately \$80,000 in 2019. Specific areas of increased expenditure included salaries and benefits, transaction fees and commissions and training and development.

When asked how the funds returning to chapters were accounted for in the financial statements, Director of Finance Mehta advised that a line item in the financial statements noted these funds.

A licence holder inquired regarding whether the surplus would allow for the reinstatement of some cancelled activities, such as scholarships. President Hill noted that the reinstatement of scholarships had been considered by Council and defeated, and that the excess

funds were transitory and partially due to the lack of a full complement of staff. However, the matter could be considered by Council at some point in the future.

A query was made regarding whether the surplus would allow for the reversion of the changes to the Financial Credit Program for the first year of the EIT program. President Hill stated that there was no intention of reversing the decision as a substantial decrease in applicants was not experienced.

When asked if online applications and renewals would lead to savings for members in the future, President Hill replied that she did not anticipate any lowering of fees.

A licence holder inquired as to whether, especially due to COVID-19, the same surplus pattern should be anticipated in 2020–2021. President Hill stated that a surplus was not anticipated in 2020–2021, as the organization planned to renew operations and fill staff shortages.

A question was raised regarding the strength of the staff at PEO, and an answer was deferred.

In response to a query regarding the ratio of staff to members, President Hill reported that staff ratio information was available in the question-and-answer booklet. The president stated that PEO’s staff ratio was the lowest of any engineering regulatory organization in Canada.

In response to a query regarding whether PEO was a charitable organization, President Hill stated that PEO was a regulator.

In response to a query regarding how PEO’s expenses ranked relative to other provinces, President Hill reported that PEO was a lean organization vis-à-vis the staff ratio and fees. In response to a query regarding the effect of COVID-19 on PEO’s finances for 2020–2021, CEO/Registrar Zuccon stated that the matter was being monitored and the impact did not appear to be significant.

A licence holder inquired as to whether virtual meetings would replace in-person meetings in the future. President Hill stated that, along with holding some in-person meetings, there was interest in exploring virtual options in order to be efficient, effective and to engage the entire province.

In response to a question regarding where licence holders could access PEO’s financial plans, President Hill noted that such information could be found on the PEO website in the AGM area.

In response to a question regarding the total cost for contract staff in 2019–2020, Director of Finance Mehta advised that the cost for contract staff was \$551,000.

A licence holder inquired as to why members were not consulted on the large fee increase. President Hill stated that fees were raised 20 per cent

across the board due to the fact that fees had not been raised in 10 years.

In response to a query regarding whether there were any possible areas to cut costs that would not affect services, President Hill noted that aggressive cost cutting was conducted over the previous two years and any more cuts would affect services.

A licence holder inquired as to whether PEO had one part-time investigative staff person due to cost-saving measures, and if that staff complement would change in future. CEO/Registrar Zuccon stated that there were a number of regulatory compliance investigators on staff as well as an enforcement group with a number of employees.

In response to a query regarding the composition of a full staff complement, CEO/Registrar Zuccon reported that there were seven vacancies, including two deputy registrars, a chief administrative officer, and a director of human resources, along with a number of other individuals on leave.

A licence holder inquired regarding the cancellation of large events. President Hill stated that the AGM was postponed and moved to a virtual setting, and that many local events were cancelled or converted to virtual events. Members should look online for upcoming plans.

Regarding the possibility of moving PEO operations online due to COVID-19, as well as to achieve financial benefits, President Hill stated that a team was investigating the possibility.

A licence holder reported that chapter funding for educational outreach was eliminated when it could have been reduced to allow chapters to continue their work. President Hill advised that the matter was not specifically addressed by Council and suggested that the licence holder discuss the matter with their regional councillor.

In response to a query regarding the location of the chapter audited financial statements, President Hill advised that they were part of the PEO audited financial statements as available on the website.

Regarding the fee for the recent governance consultation, President Hill stated that the expense was included in the financial statements within overall Council and operational costs.

In response to a query regarding consideration around engineering fees for those affected by COVID-19, President Hill noted that a member motion on that topic would be presented later in the meeting.

In response to a query regarding whether remote work would reduce PEO's costs, President Hill advised that a large operational expense reduction for 2020–2021 was not expected.

In response to a query regarding whether there were ways to save on transaction fees, President

Hill stated that the matter was investigated, and it was determined that additional savings were not possible.

A licence holder inquired regarding the total non-liquidated assets of PEO in 2019–2020. President Hill advised that a record of all member financial questions would be shared with the Finance Committee and staff for their consideration.

It was moved by Lorne Cutler, seconded by Arjan Arenja, that the 2019 audited financial statements be received as presented.

Motion carried

APPOINTMENT OF AUDITORS

President Hill advised that the Audit Committee had recommended that the firm of Deloitte LLP be reappointed.

It was moved by Guy Boone, seconded by Sherlock Sung, that the firm of Deloitte LLP be appointed auditors of the association for the 2020 financial year.

Motion carried

REGISTRAR'S REPORT

CEO/Registrar Zuccon extended a warm welcome to all in attendance and thanked staff for facilitating the virtual AGM. CEO/Registrar Zuccon reported on the success of PEO in adapting to remote work during the pandemic while maintaining the functions of PEO. He also noted that COVID-19 had heightened the urgency for PEO to modernize and adopt digital technologies. CEO/Registrar Zuccon stated that:

"Today, PEO is undergoing an enterprise-wide transformation along three critical paths. The action plan Council approved in September [2019] defines PEO's change vision and provides guiding principles that will serve as the ground rules for our operational transformation and define how this clarity can be achieved as we address the recommendations from our external regulatory performance review.

"The plan includes the Council-approved activity filter, an important tool to classify activities and corresponding outputs of PEO committees, task forces, working groups and chapters, with an aim of ensuring that all change initiatives are collectively and appropriately aligned.

"As we work to address the recommendations from the external review, we are also taking into consideration the structural changes necessary to ensure our organization has the appropriate capacity and agility to achieve our objectives.

"Consequently, we engaged an external consultant, Western Management Consultants (WMC), to carry out an organizational review to gauge our

current capacity and to better position the organization to strategically manage the change process. Their final report was presented to our senior management team in February [2020].

“According to WMC, the findings indicate a need to reorganize and rebuild the administrative organization while continuing to deliver services. This includes consolidating and grouping current functions, with changes being phased-in on a prioritized basis. Such work is anticipated to take approximately two to three years.

“As we continue to develop a more appropriate organizational structure for PEO, it’s critical that we underpin it with good governance practices that are founded on clearly defined roles and corresponding accountabilities. To this end, Council agreed in June [2019] to engage the services of Governance Solutions Inc.

“Since then, they have provided independent expertise to assist Council and the president and chair with developing and maintaining sound governance and leadership practices to ensure that PEO continues to act in the public interest. This work has culminated in Council’s recent approval in principle of a transformative two-year Governance Roadmap to establish appropriate reporting and accountabilities for all outputs of PEO.

“Council delegated the responsibility for overseeing implementation of the Governance Roadmap to the Executive Committee. An RFP for this work has been issued, and we hope to begin implementation in late summer or early fall [2020]. Combined, the work on these three paths will provide the clarity of purpose necessary to ensure all change initiatives are collectively and appropriately aligned.

“As we planned and started on these paths of change, we also began streamlining, simplifying and reducing subjectivity on a number of fronts to stabilize and prepare the system for change. Several of these were undertaken to enhance the licensing processes.

“In addition, Council’s decision in March [2020] to join the National Professional Practice Examination (NPPE) program further supports and advances our move to a fully digital licensing process that is more objective, fair and transparent; with an exam that is valid, reliable, fair (psychometrically defensible) and complies with recommendations from the Office of the Fairness Commissioner; and aligns to the recommendations from the external regulatory performance review.

“Certificates of authorization are now renewable online via our portal. New digital processes allow for the automated distribution of email notices from PEO, and [certificate of authorization]

holders are now able to manage their accounts online.

“Further, through a collaborative effort, we have reduced the administrative burdens on chapter volunteers through the centralized banking initiative. The idea was brought forth by former councillor Tim Kirkby. It was then thoroughly researched by staff, received valuable input from our Audit and Finance committees and was communicated and supported by our chapter office as well as our chapter executives under the stewardship of the Regional Councillors Committee. Our staff in finance then implemented the changes in a timely fashion.”

In conclusion, CEO/Registrar Zuccon noted that all of the initiatives reviewed stem from a new way of thinking and operating, and that PEO was undergoing a significant change process. Members would be kept apprised of the progress of those initiatives.

PRESIDENT HILL’S OUTGOING REPORT

President Hill presented a message at the close of her term. She noted that it was an honour and privilege to serve as PEO’s 100th president and seventh female president. She stated that her Council had served during the most momentous period in PEO’s history, following the regulatory performance review and the subsequent steps towards a comprehensive modernization project. At the first meeting of Council, the report was accepted in its entirety and Council committed to an action plan to address its recommendations.

President Hill stated that the regulatory review was mixed, with just under half of the reviewer’s regulatory standards met and notable weaknesses in licensing. However, the review provided a way forward, including 15 recommendations that will help chart a path for renewal.

President Hill continued, noting that:

“To implement the recommendations, work began on an action plan, which [Council] approved at our September [2019] meeting. However, realistically, this plan will require the work of multiple councils to see it through to completion. It will require several years, legislative changes, and significant work from both staff and Council.

“...To ensure we have the proper structure to get the job done, [Council has] also committed to both organizational change at the operational level and governance renewal at Council... Implementing the action plan will require strong leadership and I’m confident we have this with incoming Council executive members Marisa Sterling, who will be sworn in as president shortly; and President-elect Christian Bellini.

“Strong leadership will require a sound governance structure [regarding] how PEO oversees itself and sets strategies and priorities. To this end, [Council] began work on governance renewal and change at our June [2019] Council workshop. We spent the weekend looking inward at some key issues: examining PEO’s public interest role; [PEO’s] role as a regulator versus an association; policy versus operation; and the roles and responsibilities of Council, the CEO/registrar and staff.

“We also discussed the kind of Council we want to be: one that is focused on oversight and advisory roles, setting goals for the organization and overseeing performance. To assist with this, we engaged a governance advisor, Governance Solutions Inc., to help us develop sound governance and leadership practices and to ensure that we continue to act in the public interest. Since fall [2019], the advisor has attended all Council meetings; coaching us on governance culture and practices; clarifying roles and responsibilities; and guiding agenda creation, priority setting and maintaining appropriate public interest programs.

“I believe this work has paid off in making us a more effective, appropriately focused Council... To maintain this momentum, the advisor has given us a two-year roadmap with key steps and milestones to help continue building our governance effectiveness. In March [2020], Council approved in principle this 22-point roadmap, agreeing to hire a governance consultant to help us implement the steps and to task the Executive Committee with oversight of the governance renewal process.

“Other governance improvement steps include ongoing governance training for Council, a new councillor onboarding program, reporting and oversight metrics, and developing and implementing an activity filter. This will lead to the assessment and alignment of committees, depending on whether they fill a regulatory, governance or neither role. These important steps demonstrate Council’s commitment to both improving its effectiveness and PEO’s broader modernization project.

“...these are just the first steps to a longer-term effort. Building our governance capacity together with our work, with staff...is vital if we’re to meet the recommendations from the external review... [Council] must act as an oversight board and leave operations to the registrar and staff...we need to follow the good governance adage, ‘eyes open, noses in, fingers out.’

“The [engineering] profession is advancing exponentially, with new disciplines and technologies emerging regularly...we have some catching up to do if we’re to regulate to the full extent of engineering in [Ontario] and as defined in the *Professional Engineers Act*. A strong Council is key to

building a PEO that’s up to the task of regulating modern engineering...I’m confident that following the Governance Roadmap will result in a modernized Council that’s focused on high-level strategy and guiding PEO as a regulatory leader.”

In closing, President Hill gave special thanks to CEO/Registrar Zuccon, the senior management team and the entire staff. She expressed her confidence in CEO/Registrar Zuccon leading the modernization effort and wished incoming President Sterling much success during her term.

There was a 10-minute break.

President Hill recalled the meeting to order.

MEMBER SUBMISSIONS

President Hill stated that, as noted in section 17 of By-Law No. 1, PEO’s AGM is held:

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

She advised that submissions presented to the AGM were a way for members in attendance to express their views on matters relating to PEO affairs. A guidance document to assist licence holders in making submissions to the AGM was posted on the PEO website. Submissions were due on Thursday, May 14, 2020. The complete submissions as received by PEO, which in some cases contained preamble and background information, were available on the website.

President Hill noted that members were invited to make pre-recorded introductions to their submissions. Council reserves the right to consider any submission, even if it does not receive majority support at the AGM. However, Council is not bound to adopt or vote formally on any submission.

The proponent of the first submission was invited to introduce their motion.

A pre-recorded message from Ray Linseman, P.Eng., vice chair of the Thousand Islands Chapter, was presented. It was noted that the regulatory review did not address the lack of a formal documentation policy at PEO and the resulting difficulty in finding documents for chapters. PEO documents are stored in a variety of settings using different organizational methods, including the chapter website, the PEO website and SharePoint. Ray Linseman advised that the ISO 9002 and ISO 9001 quality management systems ensure that document control best practices are observed. The

benefits of ISO certification included providing better service to stakeholders, obtaining a second opinion of the regulatory review and improving succession planning.

Moved by Ray Linseman, seconded by John Ireland, P.Eng.

THEREFORE, BE IT SUBMITTED THAT PEO Council establish a policy that it will become ISO 9001:1500 certified by 2022 on its 100th anniversary.

Motion carried

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

A pre-recorded message from Pappur Shankar, P.Eng., chair of the Mississauga Chapter, was presented. It was stated that many members had been laid off or were working on a part-time basis due to COVID-19 and were unable to pay PEO fees. It was requested that Council defer the collection of membership fees until March 2021. It was noted that engineers who retain their licences remain obligated to the *Professional Engineers Act*.

Moved by Pappur Shankar, seconded by Artemy Kirnichansky, P.Eng.

THEREFORE, BE IT SUBMITTED THAT PEO Council defer collection of the membership fees until March 16, 2021.

Motion defeated

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

A pre-recorded message from Tapan Das, P.Eng., was presented. It was noted that very few innovators and entrepreneurs were obtaining a P.Eng. licence. The requirement of a minimum of four years of acceptable engineering experience excludes engineering graduates who start a business after graduation. It was suggested that PEO change its pathway for acceptable engineering experience and provide alternative methods for accredited graduates to demonstrate their skills. It was further suggested that Council create a working group drawn from members of the Licensing Committee, Academic Requirements Committee and academics from universities to consider options to assist innovators and entrepreneurs in qualifying. It was stated that the lack of support in this area was a gap in PEO's mandate and a risk to public interest.

Moved by Tapan Das, seconded by Joe Podrebrac, P.Eng.

THEREFORE BE IT SUBMITTED THAT PEO Council adopt new pathways to the P.Eng. licence to recognize engineering experience attained while engineering students are in accredited undergraduate programs (through co-op placements, jobs, capstone projects and other experience opportuni-

ties) and attained while engineering graduates work outside of the traditional employee/employer relationship without a direct P.Eng. supervisor (such as entrepreneurs, innovators and graduates who apply their engineering education to new and emerging fields of technology).

Motion defeated

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

A pre-recorded message from Peter DeVita, P.Eng., was presented. It was noted that the scope of the engineering profession was ever expanding, with 33 current practices. Councillors were no longer assigned as the gatekeepers to their specialization. Solutions have been proposed, but a satisfactory one had not been implemented. Fundamental governing change was required with member participation. It was noted that the motion was a follow-up to 2019's successful motion.

Moved by Peter DeVita, seconded by George Comrie, P.Eng.

THEREFORE, BE IT RESOLVED THAT:

1. PEO create an organizing team to convene a series of regional town hall meetings (RTHM) across Ontario, per region, to engage the members in a dialogue of the issues and what we might do about them;
2. That the RTHMs include, as a major component, breakout sessions for each of the main practice disciplines to discuss the key issues impacting these practices and the ability to properly serve and protect the public interest;
3. That the main engineering practice areas shall include: civil (all current forms of water treatment, roads, traffic control), structural, mechanical (HVAC and transportation), electrical power, electrical computers and control, software, cyber systems security, mining, chemical, industrial and manufacturing, artificial intelligence (AI) – robotics – mechatronics, bio, nano-molecular and others with a significant number of members present; and
4. That, in preparation for these RTHMs on where the profession is to go, PEO provide members with a comprehensive list of fundamental documents, such as the McRuer reports that define Canadian self-regulation, as well as documents on the fundamentals of a proper licence and what it means in relation to serving and protecting the public interest.

Motion carried

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

A pre-recorded message from Tiberiu Preda, P.Eng., was presented. It was stated that, due to the COVID-19 pandemic, there had been an increased dependence on and requirement to produce, sign and seal electronic documents. There was currently no way to do so unless an engineer's company had enrolled in a service. PEO's documentation on the use of electronic seals was 15 years old and states that engineering firms must have a well-documented process to support the validity of documents with electronic signatures and seals. Only Notarius provides third-party signatures in Canada and was on the Adobe approved trust list. Notarius was in use by 10 of the 12 engineering regulators in Canada. Tiberiu Preda suggested that PEO proceed expeditiously during COVID-19 to avoid risk due to the lack of security of current processes.

Moved by Tiberiu Preda, seconded by Alex Chong, P.Eng.

- WHEREAS the COVID-19 pandemic has increased the need for professional engineers to produce and seal/sign electronic documents;
- WHEREAS the Supreme Court (Edgeworth Construction Ltd. v. N. D. Lea & Associates Ltd.), stated that "the seal attests that a qualified engineer prepared the drawing. It is not a guarantee of accuracy." Instead, it should be considered a "mark of reliance," an indication that others can rely on the fact that the opinions, judgments or designs in the sealed documents were provided by a professional engineer;
- WHEREAS PEO has acknowledged in the *Use of the Professional Engineer's Seal* document that "electronic documents can easily be changed and copied with no obvious indication";
- WHEREAS PEO has, in the same document, recognized the existence of electronic signatures and has placed the burden of ensuring the security of the signature on companies and practitioners;
- WHEREAS companies often do not adhere to these guidelines and instead require staff to use insecure self-signed certificates;
- WHEREAS it is impossible in Canada to obtain a validated third-party certificate from the sole Canadian company (Notarius) that is on Adobe's approved trust list unless either the individual's company or professional association have partnered with Notarius;
- WHEREAS ten (10) out of the twelve (12) provincial engineering regulatory bodies have partnered with Notarius, with PEO and Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG) being the sole exceptions;
- WHEREAS a partnership with Notarius does not replace the paper seal and is in no way compulsory upon a practitioner, but simply provides them with a tool, at their own cost, for ensuring the public of the security and veracity of their seal/signature;
- WHEREAS the correct and consistent implementation of digital signatures/seals provides assurance to the public that an electronic document has the same integrity as a paper document with the traditional P.Eng. stamp;
- WHEREAS timely implementation of digital seals is essential to minimize the time at risk or risk exposure of practitioners who must prepare and sign electronic documents using insecure methods at their employer's request during the COVID-19 lockdown;
- WHEREAS it is impossible for many practitioners to seal a paper copy of a document, since most do not have access to the large format plotters and scanners that are necessary for many engineering drawings.

THEREFORE, BE IT SUBMITTED THAT Council expeditiously investigate and pursue a partnership with Notarius such that licence holders may purchase a third-party digital certificate for the signing/sealing of documents.

Motion carried

President Hill asked the proponent of the sixth submission to introduce their motion.

Via pre-recorded message, Peter Cushman, P.Eng., noted that PEO was a member-driven organization intended to regulate licence holders in order to serve the public interest. The democratic nature of the organization cannot be pursued if democratic processes are not followed. The motion affirms that members are asked to support and uphold democratic processes.

Moved by Peter Cushman, seconded by Keivan Torabi.

THEREFORE, BE IT RESOLVED THAT a motion be placed on the agenda at the next regular meeting of Council affirming that this association be governed democratically and that every member of the association has an equal voice.

Motion defeated

President Hill asked the proponent of the seventh submission to introduce their motion.

Via pre-recorded message, Peter Cushman stated that every profession requires a strong regulator and a strong advocate. Over the years, PEO has provided funding and other assistance to OSPE, including OSPE membership invoicing. In recent years, the relationship between OSPE and PEO had declined. OSPE has continually attacked PEO and has begun to undermine PEO's *raison d'être*. As a regulator, PEO should have done a better job of communicating and problem-solving. OSPE raised concerns publicly with the Ontario attorney general, federal government and Engineers Canada that were simply differences of opinion between two organizations. Peter Cushman requested that PEO cease all direct and indirect support to OSPE until OSPE removes and replaces their current CEO, rescinds the antidemocratic changes they made to their bylaws and turns back to being a democratic and member-driven organization.

Moved by Peter Cushman, seconded by Keivan Torabi, P.Eng.

THEREFORE, BE IT RESOLVED THAT a motion be placed on the agenda at the next regular meeting of Council affirming:

1. That this association will strictly comply with the *Professional Engineers Act* by restricting its activities to its legislated principal object and five additional objects.

2. The association will immediately stop collecting money for other organizations, like the Ontario Society of Professional Engineers (OSPE).
3. The association will immediately desist from every other activity that directly or indirectly supports (financially or otherwise) the OSPE.

Motion defeated

President Hill advised that all questions and comments submitted by licence holders during the submission discussion would be archived for future consideration by Council.

QUESTIONS TO COUNCIL

President Hill invited members to submit questions to the current Council. It was noted that staff would follow-up on those questions that could not be answered during the meeting due to time constraints.

In response to a query regarding whether President Hill was optimistic about the OSPE-PEO Joint Relations Committee (JRC), President Hill stated that PEO and OSPE have a long working relationship. All members of the JRC felt that it was important to have a strong regulator and a strong advocacy body, therefore, there was a lot of good will and a shared purpose in the need for both organizations to be strong.

In response to a query regarding when email applications would commence, CEO/Registrar Zuccon advised that it was anticipated that applications would begin in approximately mid-June 2020.

A licence holder requested an update on PEO's activities regarding special status as qualified personnel with the Ministry of Environment, Conservation and Parks. CEO/Registrar Zuccon advised that he would investigate and respond to the member. President Hill noted that PEO was developing good working relationships with many of the provincial ministries that have co-regulator status with PEO.

In response to a query regarding PEO's position on PEAK, President Hill reported that the regulatory review identified the need for PEAK to be revised. Such a review was expected to be a mid-term activity.

A licence holder stated that the new expense process for chapter volunteers should be straightforward and that it was unreasonable to obligate volunteers to undertake many detailed steps for reimbursement. President Hill took the comment under advisement.

A licence holder noted that he differed from the view of CEO/Registrar Zuccon, that centralized banking had reduced chapter efforts, and asked

what roadblocks were preventing PEO finance from providing secure access to chapter treasurers to review their chapter-centralized banking subaccounts digitally online. President Hill thanked the member for their comment and suggested that the issue be addressed with staff.

In response to a query regarding the actions PEO was taking to increase member engagement, President Hill stated that the existing processes, in particular the chapters, were designed specifically for and to encourage member engagement.

A licence holder inquired as to whether Council was seriously considering eliminating the chapter system. President Hill advised that the issue had not been addressed and was part of the regulatory review recommendations. As the review proceeds to the next stage, chapters will be part of the deliberation regarding accountabilities for PEO's activities.

In response to a query regarding individuals guilty of violating PEO bylaws not being eligible to serve on chapter boards or committees, President Hill stated that she would take the comment under advisement and investigate further.

In response to a query regarding how much money PEO spends on regulatory versus non-regulatory activities, President Hill stated that all activities will be placed through the activity filter to clearly align activities under different headings. At that time, PEO will be in a better position to answer the question.

A licence holder inquired as to how PEO will properly recognize the new inductees to the Order of Honour without an in-person ceremony. President Hill noted that a decision on that matter had been deferred and PEO was considering various options.

A licence holder stated that chapters were understandably concerned about the recommendation to consider chapter closure and asked if any actions were being considered. President Hill stated that chapters were part of the activity filter and that PEO needs to ensure that there are accountabilities for each and every activity.

In response to a query regarding whether PEO was aware of any provincial regulatory orders of engineers that allowed continual professional development hours to be optional, President Hill advised that, in general, PEAK was part of the regulatory review.

A licence holder inquired as to the decision of the JRC regarding the letters sent by OSPE to the provincial and federal governments. President Hill reported that Council had a fulsome discussion on the matter and PEO's concerns were raised with OSPE.

In response to a query regarding action taken to find efficiencies in chapter expenses vis-à-vis the effectiveness of their programming, President Hill stated that that was a Regional Councillors Committee (RCC) matter and should be raised with them. A licence holder stated that PEO needed to clearly define the use of the title “engineering manager.” President Hill agreed that more clarity was required and that PEO must regulate engineering as defined by the *Professional Engineers Act*.

In response to a comment stating that chapters cannot engage members, as most of their activities do not fall under the regulatory and governance buckets in the activity filter, President Hill stated that it is not PEO’s primary role to engage engineers per se. It is PEO’s job to protect the public and regulate engineers.

In response to an inquiry regarding the fee paid for the regulatory review, President Hill stated that she did not know the fee amount.

In response to a query as to why PEO still collects OSPE fees, President Hill advised that it was a historic practice that Council had never revisited.

In response to a query regarding the rationale for Council’s motion to pay the OSPE membership fee of all the P.Eng. councillors and staff, President Hill agreed that it was perhaps time to revisit that practice. It was noted that the payment was intended to support professional development generally and the notion that a strong regulator needs a strong advocacy body.

In response to a query regarding how PEO is expediting the licensing process (i.e., resolving the issues faced by EITs), CEO/Registrar Zuccon advised that PEO was working to stabilize the current system and reduce some of the front-end complexities. He noted that PEO was looking at streamlining processes as part of a larger holistic approach, and that COVID-19 heightened the urgency to significantly change some business practices and rules.

A licence holder commented that selecting new leadership at the chapter level was being defeated by “old-timer” volunteers who were maintaining a circle of personal choices for executives. President Hill stated that PEO was looking at governance in a more holistic and structured way, including term limits to ensure a renewal process. The matter should be taken up by the RCC as it is responsible for chapter processes.

In response to a query regarding whether the progress of the regulatory review would be posted on PEO’s website, President Hill noted that the regulatory review and action plan were on the website but should be made easier to access.

In response to a query regarding the timeline to conduct chapter AGMs during COVID-19 to form

new executive boards for 2020, President Hill suggested that the RCC create guidelines for chapters on this matter.

A licence holder commented that enforcement and engagement are two sides of the same coin and asked if PEO was committed to investing in resources and programming, including tangible targets, for the next few years. President Hill stated that the regulatory review commented on enforcement, and Council made a strategic decision that the first priority for improvement targets would be licensing. CEO/Registrar Zuccon stated that the enforcement group remains active during COVID-19 and is open to receiving submissions from external sources, including chapters.

In response to a query regarding whether President Hill agreed that OSPE represents all of Ontario’s 85,000 professional engineers, President Hill stated that PEO and Council have not yet made a decision on that issue.

A licence holder inquired as to whether PEO could hold training classes related to engineering fields that would generate revenue for PEO and involve more professionals with PEO activities. President Hill stated that this was not a Council focus, but individual chapters may conduct training on specific topics. It was noted that there were many providers that offer engineering training and micro-credentialing.

In response to a query regarding whether being a PEO employee or councillor and a member of the advocacy body would create a conflict of interest, President Hill thanked the member for the comment.

A licence holder inquired whether, beyond the digital seal discussion, there was action from PEO to accept digital signatures on office documents, such as the new chapter expense submission. CEO/Registrar Zuccon noted that PEO was reviewing that area.

In response to a query regarding whether the next AGM would be held virtually, even if COVID-19 was no longer a concern, President Hill stated that a decision had not yet been made but Council would be reviewing the matter.

A licence holder inquired as to whether a provision could be made for engineers holding licences in multiple provinces to only record continuing education in one province. President Hill stated that, within the past year, the issue was raised at Engineers Canada meetings and should be reviewed as a long-term goal.

In response to a query regarding how knowledge transfer was occurring between incoming and outgoing Council members, President Hill noted that president and councillor onboarding orientations had recently occurred. The issue of term

limits had been raised multiple times and the question remains valid.

In response to a query regarding whether it was possible to openly share discussions and minutes from the JRC on the PEO website, President Hill advised that the matter could be brought to the JRC for discussion.

A licence holder inquired as to whether there had been any progress on the Council resolution to eliminate the industrial exception for the nuclear industry. CEO/Registrar Zuccon stated that it was hoped that information could be shared at the June 2020 Council meeting.

In response to a query regarding future plans to obtain new sponsorships for scholarships, President Hill did not believe such activity was taking place but would refer the comment to the RCC.

A licence holder stated that their chapter was not consulted regarding the activity filter and that chapter activities should be included in the activity filter list. President Hill stated that PEO had robust chapter representation within Council with a strong voice.

In response to a query regarding the possibility of facilitating dual memberships for two or more provincial P.Engs to assist freelancers working in multiple provinces, President Hill noted that the topic of continuing professional development and harmonization had been raised at the presidential level and other levels through Engineers Canada. It was unlikely that a regulator would provide a cost reduction.

A licence holder commented that, due to living in northern Ontario, attending the PEO AGM was a challenge. PEO was encouraged to continue to use virtual venues in the future to allow for more member involvement. President Hill thanked the member for their comment.

A licence holder stated that, with term limits enforced, implementation of the recommendations in the Succession Planning Task Force should be a priority and should be included under the governance improvements. President Hill noted that the intention was to do so as part of the Governance Roadmap.

A licence holder requested that Council meetings be webcasted to improve member engagement, with in-camera sessions excluded. President Hill advised that the most recent Council meetings were webcast and that PEO was investigating digital tools as one of the recommendations of the regulatory review.

A licence holder commented that PEO chapter meetings should be conducted online during the COVID-19 crisis, and that they should continue to broadcast post-COVID to increase member

engagement. President Hill thanked the member for the comment.

In response to an inquiry regarding whether the AGM was broadcast and would be made available at a later time, President Hill confirmed that it was being recorded and would be made available to members.

PRESENTATION TO OUTGOING COUNCILLORS

President Hill congratulated retiring members of the 2019–2020 Council who had worked diligently to move the profession forward. President Hill expressed her personal appreciation to all for their collaboration, support and encouragement throughout the year.

It was noted that certificates of appreciation would typically be presented to each retiring member at this time. However, they would be presented in-person at the earliest and safest opportunity to the following members: Past President David Brown, Eastern Region Councillor Guy Boone, Western Region Councillor Gary Houghton, Northern Region Councillor Serge Robert, East Central Region Councillor Keivan Torabi and Councillor-at-Large Gregory Wowchuk.

INSTALLATION OF NEW PRESIDENT

Past President Hill administered the oath of office to Marisa Sterling as 101st president for the 2020–2021 term.

CLOSING REMARKS BY PRESIDENT STERLING

President Sterling addressed the meeting via a pre-recorded message, stating the following:

“I want to welcome everyone who is tuning in from their homes throughout Ontario and afar. My PEO Council colleagues, staff, members, engineering interns and students, deans of engineering and our higher education partners, employers, regulatory colleagues from across Canada and so many other partners and friends.

“It goes without saying that this is not how I pictured delivering this speech when you elected me your president 15 months ago. However, with vision and hard work, we are making history today participating in an entirely virtual annual general meeting, a first in PEO’s nearly 100-year existence.

“I want to recognize the rapid changes you have all had to make recently. I want to applaud your resilience as you find new ways of working, of taking care of your family and loved ones and of taking care of yourself. I understand. This is an unprecedented, uncertain and constantly changing time. And, although we are here virtually, we are still together. I thank all of you for your hard

work and patience during this time. Thank you for being here.

"I would like to share with you what I've been hearing from the many conversations I've had about the opportunities ahead of us for the coming year. In each conversation, there has been an urgent excitement to modernize PEO towards one consistent theme—to ensure that protecting the public is paramount. This is the one goal that unites us.

"PEO has focused on its public protection mandate this past year as it processed and approved more than 4000 new licences, reviewed 121 complaints and prosecuted three individuals over illegal practice matters. In addition, over the past few months, PEO and the engineering community have protected the public interest in their activities during the pandemic.

"I want to recognize the recent outstanding efforts of our CEO/registrar, staff and volunteers. One example of how they have innovated during this emergency was by providing digital stamps to newly licensed engineers so their work could be sealed.

"I'm also very proud of the PEO licence and certificate of authorization holders who are among the researchers, manufacturers, businesses and others in Canada who are providing both goods and services and ideas and innovations to help combat COVID-19. In all, so many in the engineering community are making exceptional efforts, individually and collectively, to help in any way they can. I have started to share on my website specific examples, and I invite you to share more stories with me so we can recognize everyone.

"The position that PEO and professional engineers have taken illustrates how we always work to protect the public and live up to our obligations set out in PEO's Code of Ethics. Since my days as an engineering student, I wanted to become a P.Eng. because to me it represented joining a community of professionals that cared for others. I continue to be inspired by the positive impact we make on the day-to-day lives of our communities. It motivates me to ask, 'How much more can we contribute if we reimagine PEO?'

"There are many trends, reinforced during this global emergency, that signal the time is now for PEO to reimagine how it can better protect the public. And, even though we are currently living through a crisis, this can also be an opportunity for rapid, meaningful change. For example, we are witnessing how the lines between the digital, the biological and the physical worlds are colliding and reinventing themselves in many different ways. Artificial intelligence, computer vision and nanotechnology have created machines that can

increasingly see, learn and act in ways that are transforming our world. A self-driving car, a smart device, a way to correct our DNA—all are impacting peoples' lives, privacy and health. Could the scope of PEO's licensing reach further into these fields of work to safeguard the public?

"We are also seeing how much the public trusts engineers and expects that we will keep them safe. For example, when a Canadian economist recently turned his fear of the pandemic into an opportunity to create the most amount of good, he chose to name the project Helpful Engineering. Could PEO's priorities have broader public consultation to stay aligned to the trust placed on our profession?

"And we are seeing how the use of crowd-sourcing and swarm models are allowing us to collaborate globally and develop rapid-response engineering solutions for our quickly changing world. Could PEO be playing more of a role to protect the public in engineering solutions that are coming from around the world?

"These three trends—the evolution of digital technologies, the high expectations on engineers to safeguard the public and the global crowd-sourcing of solutions—are just a few examples of the changing world that we can embrace by reimagining PEO.

"Change is our only constant—it's our new normal. As Past President Nancy Hill noted in her remarks, over the last couple of years, PEO has been laying the groundwork for transformational change. We have begun responding to an external regulatory review by approving and starting to implement an operational action plan to address the review's recommendations. This will improve our performance.

"In addition, we recently approved a Governance Roadmap to strengthen Council's effectiveness. I congratulate [Past President Hill] and our outgoing Council for their tremendous work to move PEO forward. I can assure you that I will do what I can to continue these priorities. I believe the operational action plan and Governance Roadmap will build a solid base from which we can forge ahead. But towards what?

"Our past strategic plan expires [in 2020], leaving our direction uncharted. In the abbreviated words of Seneca, 'No wind blows in favour of a ship without direction.' Now is the time to shape a new, longer-term vision. Now is the time to shape a vision that allows PEO to respond and adapt quickly to societal trends and challenges in order to continue to protect the public interest.

"The public today is asking questions such as how can they trust smart cities or consent to cell-phone tracking and know that their data privacy and data access are being managed for the public

good. They are wondering, if facial recognition software has difficulty identifying people with darker skin, what other biases are embedded in the designs of the technology that we use? And they are concerned about how to stop climate change and inequality to create a more sustainable world.

“PEO needs to not just keep up with the public’s concerns, but to lead the way in navigating how it will regulate the professional engineering involved in these issues in the public interest. To do so will require a transformation of some parts of PEO while preserving what is helpful and working. We can chart this path by reimagining PEO together.

“You are probably asking, ‘What exactly are we reimagining?’ We can reimagine who and what we need to regulate and protect the public interest 10 or 20 or 30 years from now. And we can reimagine the power of the P.Eng. licence to deliver on that public service. This can be an opportunity to dramatically increase the impact of engineering regulation in Ontario.

“I want to share some of my own early ideas. These are meant as ‘thought starters’ as we work together to share what reimagining together will look like:

- We can collaborate with higher education institutions, employers and others to reimagine the competencies and assessments for the next generation of licensed engineers.
- We can strengthen our partnerships with other regulators to reimagine how we work across borders to oversee open-sourced or globally developed engineering solutions used in Ontario.
- We can create citizen conversations to reimagine how we regulate emerging technologies, and the innovative people who create and work with them, so that the technological impacts to the public are beneficial for all.
- And we can reimagine how people of all identities are included as PEO licence holders. To this point, in the short term, I strongly believe we must not only achieve but surpass our 30 by 30 goal, raising the percentage of newly licensed engineers who are women to 30 per cent by the year 2030. Passing this tipping point will bring sustained cultural change, will teach us how to remove barriers to licence and practice and will invite people of many diverse identities to become engineers. The evidence is clear. This will have a direct impact on how PEO protects the economic interests, life and health of the public.

“I realize this reimagining can feel like a daunting task. Personally, I have found the most rewarding times in my career have been when I moved beyond what was known and routine and followed my passion to take on a new challenge. The work to establish a long-term vision for PEO will need us all working together. It will need a large group. Process matters. And people, partnerships and culture are the anchors. First and foremost, you have my commitment, as always, to be transparent, inclusive and focused on outcomes. Second, we need to begin this process by opening the doors wide to your thoughts and ideas. Engaging with organizations can help, including Engineers Canada, the Ontario Society of Professional Engineers, Consulting Engineers Ontario and the Engineering Student Societies’ Council of Ontario. As an African proverb tells us, ‘If you want to go fast, travel alone; if you want to go far in life, travel together.’

“So, let’s try to start a vibrant dialogue. To this end, I invite you to share your thoughts on a reimagined PEO with me. I want to hear your ideas on the future of PEO and the regulation of our profession in Ontario. In [mid-June 2020], PEO will be hosting its first ever online Volunteer Leadership Conference for our committee and chapter partners. A virtual conference can be a great opportunity to kick off our work of a visioning process for a reimagined PEO, one that builds on the foundations of our action plan and Governance Roadmap work currently underway. This online format can model how future PEO events can be accessible to an even broader audience among the PEO community, including EITs, engineering graduates, students, partners and the public.

“PEO’s success decades from now as a relevant and agile regulator starts with the groundwork we have already begun to lay, and a vision for our future. What will be a multi-year project to modernize and reimagine PEO has started. Our operational capacity and effectiveness will improve this year as we continue to implement our regulatory action plan. And our governance effectiveness will strengthen as we work through our roadmap with the Executive Committee and a governance consultant. By beginning to reimagine PEO, we can establish a long-term vision to chart our course.

“While we have much work ahead, I firmly believe that PEO’s north star is resolute. Our north star remains our mandate to protect the public interest. As we innovate at a pace we have never prepared for or previously experienced, our efforts need to continue to align towards this singular goal. And, as we reimagine PEO together, we will

look ahead to identify which societal changes have and will continue to affect PEO. We will reimagine our organization in a decade from now and beyond, laying the path to identify who and what we need to regulate to continue to protect the public interest. If others ask what we do, we would say that we challenge, innovate and connect. If they ask who we are, we would answer that we are open, optimistic and original.

“I am excited by the challenges ahead. I am immensely honoured to have the opportunity to make a difference in the lives of others. You might say it is in my blood, as I have parents who have role modelled leadership and service throughout their lives. If they met someone they could help, they would.

“Thank you for the opportunity to share my thoughts with you today and for entrusting me as your president. I truly value your advice, rely on your guidance and remain humble and thankful for your continuing support and trust. I very much look forward to working with all of you in the coming year on this incredible journey as we modernize and reimagine PEO together.

“Thank you. Merci. Meegwetch.”

INTRODUCTION OF INCOMING MEMBERS OF COUNCIL

President Sterling introduced the 2020–2021 members of Council: Past President Nancy Hill; President Marisa Sterling; President-Elect Christian Bellini; Vice President Darla Campbell, P.Eng.; Councillors-at-Large Sandra Ausma, Leila Notash, and Michael Chan, P.Eng., FEC; Eastern Region Councillors Randy Walker and Chantal Chiddle, P.Eng., FEC; East Central Region Councillors Peter Cushman and Arthur Sinclair; Northern Region Councillors Ramesh Subramanian and Luc Roberge; Western Region Councillors Wayne Kershaw and Peter Broad, P.Eng., FEC; West Central Region Councillors Warren

Turnbull and Lisa MacCumber; and Lieutenant Governor-in-Council Appointees Arjan Arenja, Robert Brunet, Todd Bruyere, Lorne Cutler, Andy Dryland, Qadira C. Jackson Kouakou, Iretomiwa Olukiyesi and Sherlock Sung.

President Sterling also introduced the PEO directors on the board of Engineers Canada: Christian Bellini, Danny Chui (president-elect, Engineers Canada), Nancy Hill, Kelly Reid and Changiz Sadr.

CONCLUSION

President Sterling then declared the 98th AGM of the Association of Professional Engineers Ontario concluded.

Johnny Zuccon, P.Eng., FEC
CEO/Registrar

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Deadline for January/February 2021 is November 20, 2020. Deadline for March/April 2021 is January 25, 2021.

Multiple seals on engineering documents cause confusion

Donald Ireland, P.Eng.,
Brampton, ON

I read the article by Ms. Whang regarding resolving disagreements involving the use of the PEO seal with interest (“Resolving disagreements involving the use of the professional engineer’s seal,” *Engineering Dimensions*, September/October 2020, p. 15). Although I agree there are situations where it may not be absolutely clear who should seal the engineering documents, I do not agree that there should be any disagreement in the example that the author used. I believe the clear intent of both the *Professional Engineers Act* and PEO guideline *Use of the Professional Engineer’s Seal* is that a professional engineer who prepared a design or engineering documents must seal the documents and not a reviewer or design checker.

Section 53 of the Regulation 941/90 does mention sealing documents “prepared or checked by” an engineer, but I believe this refers to the situation of an unlicensed junior engineer preparing a design or document that is checked in detail and sealed by a licensed engineer. The issue is also referred to in section 6.1 of the reference guideline under the paragraph entitled “Who seals.” That section refers to the sealing engineer as the one who provides the

largest contribution to the design documents and who is taking professional responsibility for those designs/documents. Finally, in the second paragraph of section 6.2 of the guideline, it refers to a recommendation that engineers who do review or verify work should initial the work in a designated location on the documents and states that they should not add their seal.

In the example in the article, the design engineer is noted as an experienced professional engineer. The checking engineer is noted as more senior and an expert, but from my experience, I would expect that the checking in that situation would be more conceptual in nature rather than in detail. Therefore, in my view, the design engineer in that case must seal the work, and there is no need or requirement for the checker to seal the document. The author goes on to suggest that possibly both could seal the document with written qualification notes defining their responsibility beside their seals. I believe that is not a desirable situation and clouds the issue of who is the primary engineer who has designed and/or is responsible for the engineering information shown on the documents. The public, clients and building department reviewers deserve and expect to know who is ultimately responsible for the engineering. Multiple seals on documents are required by some clients, but I believe that instead of providing clarity, that practice is more likely to provide some confusion with the issue of engineering responsibility in most situations.

EDITOR’S NOTE Thank you for your letter. The *Use of the Professional Engineer’s Seal* guideline is in the process of being revised by PEO’s Professional Standards Committee. As such, the amended guideline will be undergoing a public consultation and legal review to address these types of issues.

It’s not PEO’s place to promote gender parity

David Gelder, P.Eng., Mississauga, ON

In the July/August edition of *Engineering Dimensions*, letter writers Laura Goetz, EIT, and Samantha Dutcyvich, EIT, take Vince Janzen, P.Eng., to task over his opinion letter in the previous issue (“No place for anti-women viewpoint,” p. 53, and “30 by 30 gives us a framework to implement change,” p. 54). Ms. Goetz even criticizes *Engineering Dimensions* for publishing it, a cancel-culture attitude that I find unacceptable. I reread Mr. Janzen’s letter but still could not understand such strong reactions. PEO has been virtue signaling about increasing female engagement in engineering for decades without any meaningful result. Mr. Janzen provides a very reasoned opinion for why that is the case. Ms. Goetz and Ms. Dutcyvich expressed frustration over how female participation in engineering is not respected. While it may seem logical that PEO is “the people in charge” of that, it is not.

PEO has a strict legal mandate as a regulator of the profession. It does not do that job well, but I digress. OSPE was specifically created for the purpose of advocating for the profession. It was an endeavour to raise the profile of engineering in an effort to garner more public respect. The workplace culture and lack of professional respect issues that frustrate Ms. Goetz and Ms. Dutcyvich are not new. However, only a fraction of PEO membership support OSPE, so that initiative has not panned out. My suggestion: Double the licence fees and give that money to OSPE to create a dynamic advertising campaign to raise the profile of professional engineering and emphasize the participation of women in the field. If CPA can make accounting seem glamorous, think of what could be done with engineering. I have two daughters, and my work did not inspire them to become engineers. Let’s face it: There’s a lot of grunt work in all professions. A launching rocket looks very exciting, but there is a lot of toiling in the trenches to get there. That end result, though, instills pride of accomplishment in all who created it. That pride in our profession is lacking, and we should look at our own individual behaviour both in the workplace and outside of it for the reasons for that.

Ms. Dutcyvich writes that “the one thing I dream of is working for someone like me.” I hope she does much better than that. I hope she becomes that passionate leader who helps create workplaces that are kind, tolerant, innovative, inclusive and, specifically, supportive of child-rearing engineers. I know from my career experience that such workplaces are rare but do exist. They need to become the rule, not the exception.

PEO should replace Council with a board of directors

Tapan Das, PhD, P.Eng., FEC,
Ottawa, ON, and
Ray Barton, PhD,
Nepean, ON

PEO is governed by a Council of 25, including three councillors-at-large and 10 regional councillors elected by the licence holders, eight lieutenant governor-in-council appointees and the executive group, which includes the president, president-elect, past president, vice president (elected) and vice president (appointed). These councillors function as the governing body and board of directors of PEO. Council provides overall direction for PEO and the profession and upholds PEO's duty to protect the public interest. They are all volunteers with one- or two-year terms. PEO's mission is to regulate and advance the practice of engineering to protect the public interest through:

- licensing individuals who have met the rigorous qualifications;
- disciplining licence holders who fail to maintain the profession's technical and ethical standards; and
- ensuring that only licence holders practise professional engineering.

PEO's policies and objectives for the year ahead are determined by councillors at the Council meetings headed by the newly installed president. But they are all volunteers with a term of one to two years, so they don't have any long-term accountability for the decisions they make at those Council meetings. PEO's CEO/registrar and staff carry out the tasks decided on by the councillors but have no responsibility for the results of the decisions made. Hence, it wouldn't be wrong to say that PEO is being run by temporary volunteers. Let us compare this to a company that has a board of directors. The board of directors includes a CEO, other executives from the organization and shareholders (who may or may not also be employees or officers). Unlike PEO councillors, members of the board bear full responsibility for the decisions they make. The advocacy group OSPE has such a board of directors, including a CEO.

PEO should not be run by temporary volunteers that include councillors and officers such as presidents and vice presidents. Chapters are the interface between PEO and local engineers. This is a very important function. Otherwise, the only interface between PEO and local engineers is *Engineering Dimensions* magazine. Hence, the chapters must be retained and advanced. But they should be monitored and advised by a PEO staff member assigned to a region containing a few chapters. The following system is recommended:

1. Eliminate the current system of electing councillors, president and vice president, who are volunteers of one- or two-year terms;
2. Appoint a board of directors consisting of PEO's CEO/registrar, presidents of engineering companies and university deans of engineering faculties and departments; and
3. Retain and enhance chapter activities under the advisement of an assigned PEO staff member responsible for overseeing a region containing several chapters.

The need for radical change within PEO has already been highlighted by veterans in the engineering field (see "The need for radical change from within," *Engineering Dimensions*, July/August 2020, p. 32). But they have not gone so far as to make the fundamental change in PEO's structure and mode of operation that is proposed in this article.

Regulatory vs. non-regulatory

Changiz Sadr, P.Eng., FEC, Willow Beach, ON

After a couple of letters to the attorney general of Ontario from OSPE and the Association of Consulting Engineering Companies—Ontario (then Consulting Engineers of Ontario) referring to PEO’s non-regulatory activities, then-president David Brown, P.Eng., BDS, C.E.T., FEC, undertook a detailed review of PEO’s operations by hiring external consultant Harry Cayton. In April 2019, Cayton submitted his report, which included 15 recommendations to improve the regulatory performance of PEO.

As a result, PEO Council tasked the CEO/registrar to come up with an action plan to implement the recommendations of the Cayton report—which created significant debate among members. In the first phase of the defined action plan, an activity filter was introduced to review and evaluate all PEO’s activities and categorize them into three buckets: regulatory, governance and neither. The second phase of the action plan was to report the results of the review and categorization of activities to Council. Governance refers to activities that are directly related to policies and what Council needs to work on, and if an activity is not regulatory or governance, it is classified as neither.

In my opinion, activities are being reviewed as standalone activities and not in relation to other activities in the same path/area. For example, all Experience Requirements Committee (ERC) activities are categorized as regulatory, except for “Training of ERC members,” which is categorized as neither. How can this be possible? Why do the ERC members need to be trained? What is the content of ERC members’ training? What would happen if ERC members didn’t get trained? By thinking of these questions and trying to answer, we can clearly see that the training of ERC members is part of the ERC mandate, which is a required activity under the *Professional Engineers Act*. How then can it be considered non-regulatory?

I would like to mention two other PEO activities, which are the chapters and the Government Liaison Program (GLP). Chapters are the grassroots of PEO and its interface with members and the public. Chapters are the reason why many engineering graduates become licensed and for many of the engineering projects and activities around the country. How, you may ask? Chapters introduce PEO to the public by holding many events and outreach programs to raise the profile of engineering and PEO and by increasing public awareness about PEO, which is one of PEO’s mandates. GLP, through chapters’ GLP programs and the Government Liaison Committee (GLC), play an impactful role in communicating with MPPs to inform them about the role of PEO and the effect PEO can have on government engineering projects and initiatives. Both chapters and GLC/GLP are valued by members and belong in the regulatory bucket.

If we consider PEO activities not as standalone activities, but instead evaluate them as part of their umbrella activity, many activities in the neither bucket will move to the regulatory bucket. And PEO will be in a better position to respond to other organizations and defend its regulatory activities.



AD INDEX

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p. 2

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 editor@peo.on.ca.

RUN FOR **PEO COUNCIL**

If you are a P.Eng. with the knowledge, skills and desire to serve your profession at the highest level, we invite you to help build a stronger PEO by seeking a position on Council or by nominating a qualified colleague.

The deadline for nominations is November 27 at 4 p.m.



Professional Engineers
Ontario

2021 COUNCIL ELECTIONS

PEO is seeking P.Eng. candidates for the 2021 Council elections who reflect the diversity of its licence holders, can provide a balanced perspective and problem-solving attitude, and understand governance and self-regulation principles. Nominations for PEO's 2021–2022 Council are being accepted for the following positions:

- President-elect
- Vice president
- Councillor-at-large
- Regional councillors (Northern, Eastern, East Central, Western, West Central)

COUNCIL'S ROLE

Under the authority of the *Professional Engineers Act*, PEO governs its 91,500 licence and certificate holders and regulates professional engineering in Ontario to protect the public interest. The Government of Ontario looks to PEO Council to provide the necessary oversight to ensure PEO fulfills its mandate.



Develop and drive PEO's strategic direction



Approve PEO's budget



Make decisions impacting the profession and licence holders



Provide direction on regulatory priorities



Ensure the responsible use of resources to effectively regulate the practice of engineering



Engineers responsible for certificates of authorization: Have you done your PEAK elements?

Show the public, your colleagues and clients you're committed to competence, professionalism and transparency. The PEAK program helps you and your firm publicize your efforts to stay current in your practice and knowledgeable about your ethical obligations.

After you get your licence renewal notice, log into the member portal on PEO's website and start at the PEAK menu tab. Your PEAK completion status and practising status are posted online on PEO's directory of practitioners.



Learn more at peoPEAK.ca | peoPEAK@peo.on.ca