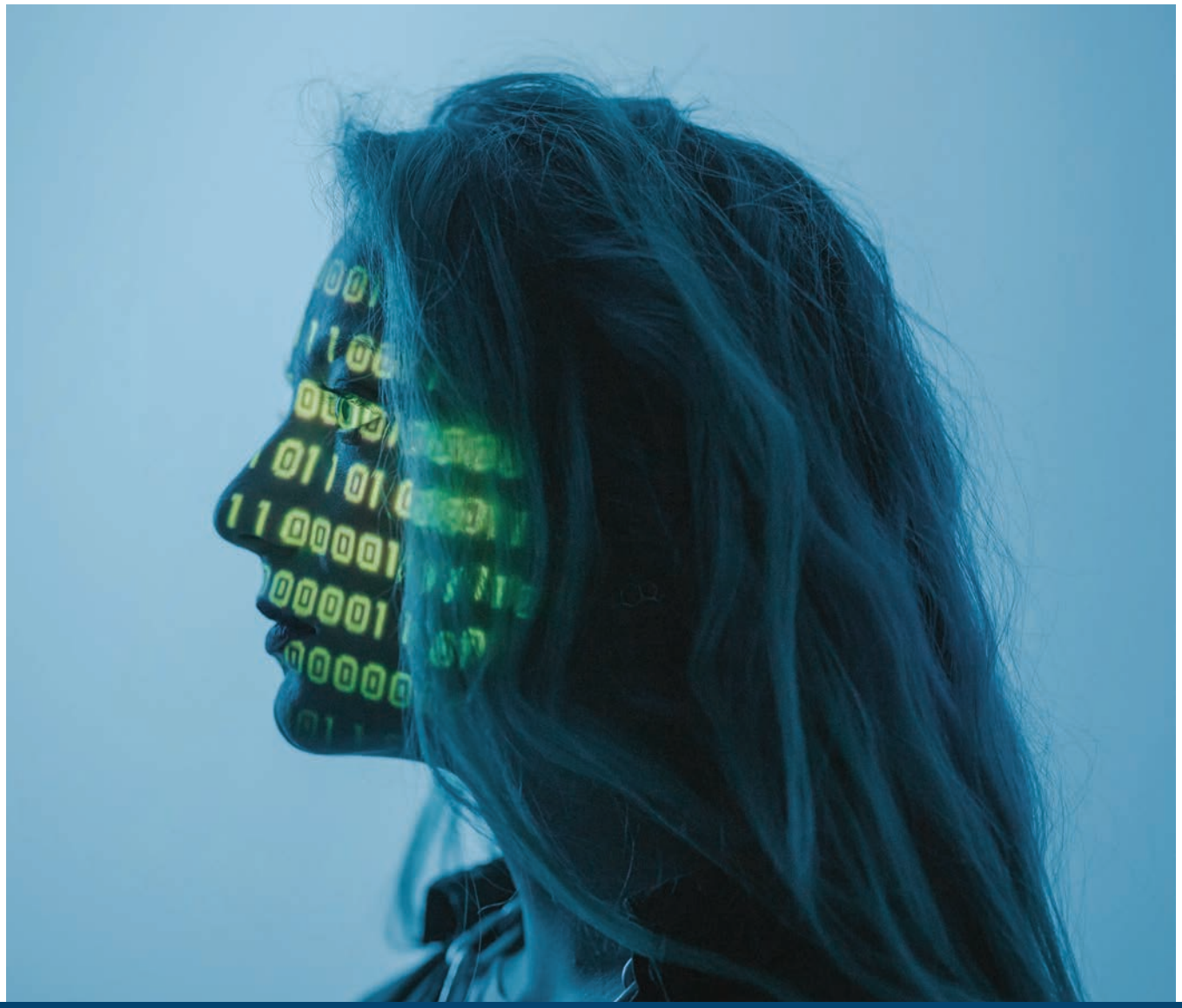
APEGS
Association of Professional Engineers & Geoscientists of Saskatchewan

THE PROFESSIONAL EDGE

ISSUE 201 • DECEMBER 2023



Practicing the Professions

Free yourself from the mortgage *squeeze.*

Manulife One.
Canada's most flexible mortgage.

Switch to Manulife One®.
Your all-in-one mortgage and banking account.

Manulife One lets you combine your mortgage with your bank accounts, short-term savings, income and other debts.

Visit **manulifebank.ca/engineersbank**.

Or call **1 877 765-2265** for more details on a special offer for engineers, geoscientists, technicians and technologists.

With Manulife One, you could:

- Potentially save thousands in interest
- Be debt-free sooner
- Simplify your banking
- Pay no monthly fees for the first 6 months and a low monthly fee of $16.95 thereafter

APEGS Association of Professional Engineers & Geoscientists of Saskatchewan

engineerscanada ingénieurscanada

Manulife Bank

APEGS
Association of Professional Engineers & Geoscientists of Saskatchewan

Regulating the professions. Protecting the public.

Leadership

Stormy Holmes, P.Eng., FEC, FGC (Hon.)
Executive Director and Registrar

Sheena August, Editor
Director of Communications and Public Relations

Christopher Jason - Director of Technology

Kate Maclachlan, P.Geo., FGC, FEC (Hon.) - Director of Registration & Deputy Registrar

Gina McGinn, MA, ICD.D. - Director of Governance & Strategy

Chris Wimmer, P.Eng., FEC - Director of Professional Standards

On the cover:

"AI Ethics: Navigating Bias in the Digital Age" was one of the sessions held as part of the inaugural Professionalism in Practice event and covered in this issue of *The Professional Edge*.

Editorial provided by:
Martin Charlton Communications and APEGS staff
#300 - 1914 Hamilton Street, Regina, Saskatchewan S4P 3N6
T: (306) 584-1000, **E:** karen@martincharlton.ca

Design and Layout:
PrintWest Ltd., **T:** (306) 525-2304, **E:** general@printwest.com

Submissions to:
The Professional Edge
300 - 4581 Parliament Avenue, Regina SK S4W 0G3
T: (306) 525-9547 **F:** (306) 525-0851 **Toll Free:** 1- (800) 500-9547
E: apegs@apegs.ca

POSTMASTER
Return undeliverable copies to: *The Professional Edge*,
APEGS, #300 - 4581 Parliament Avenue, Regina SK S4W 0G3

Advertising in *The Professional Edge*

It pays to advertise in *The Professional Edge*. You reach over 7,000 P.Engs., P.Geos., Engineers-in-Training and Geoscientists-in-Training in Saskatchewan and 7,000 others outside Saskatchewan.

Advertising Rates and Mechanical Requirements

Advertising rate, per dimensions (width x height) insertion. Colour as published.
Electronic art must be at least 300 dpi in a JPEG, TIFF or EPS format.

COVERS		1X	2X
Inside Front/Back:	$1,200	$1,200	$1,000

PAGES		1X	2X
Full page	8 1/2 x 11	$1,000	$900
2/3 page	5 1/4 x 11	$800	$700
2/3 page	8 x 7	$800	$700
1/2 page	8 x 5	$700	$600
1/3 page	2 1/2 x 11	$600	$525
1/3 page	5 x 5	$600	$525
1/3 page	8 x 3 1/2	$600	$525
1/6 page	2 1/2 x 5	$300	$275
Bus. Card	3 1/2 x 2	$150	$125

Deadlines:

Issue: June 2024
Submit to APEGS by: April 12, 2024
Publication distributed week of: June 10, 2024

https://www.apegs.ca/about/publications/the-professional-edge

The next issue of *The Professional Edge* will be in June 2024.

APEGS has reduced the number of print issues of *The Professional Edge* from six per year to two and is supplementing them with monthly e-newsletters.

Table of Contents

ISSUE 201
DECEMBER 2023

President's Message

Greg Vogelsang, P.Eng., P.Geo., FEC, FGC

Council has been busy working on numerous important projects and I am pleased to share our progress as all of you continue your important work on your own projects.

The first is work to revise the *Engineering and Geoscience Professions Act*. APEGS and the Saskatchewan government identified a need to do this work as the legislation has not been updated since 1997. Most changes will be administrative. For example, some language needs to be modernized to reflect more inclusivity and diversity.

But a part of this is work to move some items from the legislation to APEGS' bylaws. The benefit will be felt in the future when changes are necessary. Changing bylaws requires a bylaw review rather than going through the legislative process of an introduction, all the readings and receiving the royal assent to get the legislation changed.

Erin Moss Tressel, P.Eng., P.Geo. is chairing a committee that is working with the provincial government on this process. This is a significant endeavour that requires a lot of attention and focus, for which we thank Erin and her committee for their dedication.

Also underway is a review of our board and committee structure. The current governance structure is a council, which is made up of elected members plus two public appointees. There are three boards – the Regulatory Board, the Professionalism Board and the Governance Board. Each board has its own committees with volunteers. If they want a decision made, it goes up through the appropriate board and then to council.

What is being reviewed is having the committees placed into one of two groups – some operational and others governance. Operational committees would have more interaction with APEGS staff who deal with the day-to-day operations. Such committees would be the Academic Review and Experience Review. The governance committees would be those such as Audit and Risk Management Committee and the Nominating Committee. The boards would then be eliminated (refer to page 17).

Our council and staff pay close attention to what is happening in other provinces. One issue we see is the need to validate the credentials of foreign registrants. Another is the scrutiny of artificial intelligence. It is a topic of conversation at national meetings with Engineers Canada, for example. While the importance of this developing technology is highlighted, so, too, are the risks it introduces and potential damage it could cause.

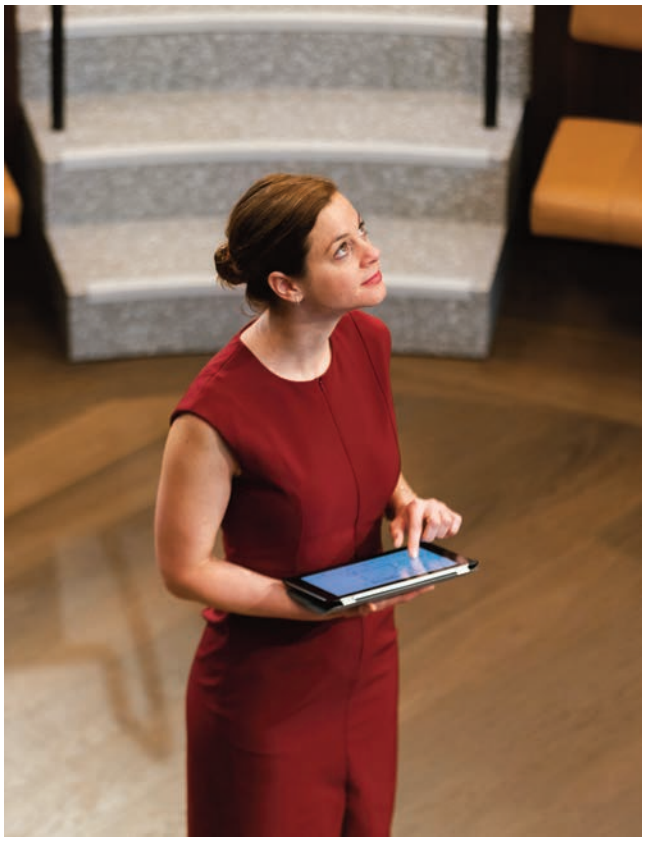
This whole area of AI is a huge leap ahead that we must carefully examine to understand its implications, which is what makes the opportunity to hear from a speaker like Ramy Nassar valuable. He presented at the inaugural "Practicing the Professions" event held in Saskatoon in late October. If you were among those present, you would have heard him urge all of us to learn and decide how to use AI appropriately.

I encourage you to also find value by reading what Chris Wimmer, P.Eng., FEC, FGC (Hon.), APEGS' Director of Professional Standards, had to share about professionalism. Then there are the ethical situations that University of Saskatchewan engineering students and their employers have found themselves in recently that were presented by Tracy McArthur, P.Eng., the Coop Coordinator for the College of Engineering at USask.

Such big concepts to consider and work through, but here in Saskatchewan, we are familiar with taking on big projects. So much so, that we see major announcements such as BHP committing an additional $6.4 billion into its Jansen potash project to have it become one of the world's biggest potash mines. We see how our province responds when major world events impact commodity markets – with the most recent one being the Hamas Israel conflict -- requiring our province to produce and ship even more to meet demands. We see big thinking happening with the move towards more green energy, which increases the demand for uranium for nuclear energy and critical minerals to produce electric batteries. Those are all projects that require the important efforts and professionalism of engineers and geoscientists who protect both the public and the environment.

Professionalism in Practice

BY MARTIN CHARLTON COMMUNICATIONS



Chris Wimmer, P.Eng., FEC, FGC (Hon.), APEGS' Director of Professional Standards, was the initial speaker at the inaugural "Practicing the Professions" event held in Saskatoon in late October. Wimmer opened by describing professionalism and what makes a professional different from other types of workers in society. A profession is a "calling" that requires training to acquire knowledge. It requires a high standard of conduct and continued learning. The work of a professional is done as a public service and requires certification or licensing. These standards are enforced by a regulator. He listed some other professions, such as lawyers, doctors and architects, as examples.

He reminded those present that the *Engineering and Geoscience Professions Act* defines the practice of the professions of engineering and geoscience and that the primary purpose of practicing is doing work that is in the public interest. Engineers and geoscientists are expected to demonstrate a high standard of achievement and conduct while continuing their training throughout their career.

Self-governing professions

From there, Wimmer explained the role of APEGS as an association. Engineering and geoscience are self-governing professions who serve in the public interest. APEGS is not a membership club established for the benefit of members.

Its primary purpose is to ensure public safety by requiring members of APEGS to be competent and qualified to serve in their roles. It does this by establishing standards for those entering the profession as well as regulating the practice of the professions. Members must conform to standards and conduct and are required to abide by the act and bylaws. Allegations of incompetence or misconduct can lead to investigations and discipline, which is required of APEGS.

Growing number of licensees

APEGS regulates the right to title as well as the right to practice. This, too, is the same for physicians and architects, for example. Wimmer explained that these are identifiable professions that the public expects will work to a higher standard of practice and behaviour. Those standards for professional conduct are described in section 20 of the Engineering And Geoscience Professions Regulatory Bylaws.

APEGS has "grown tremendously as an organization over the last decade," Wimmer said. There are now more than 17,000 members compared to less than 4,000 when he started working for APEGS. About 10,000 are P.Eng. with another 3,100 being engineers-in-training. About 700 have the P.Geo. title. He explained that only about half of the members reside in Saskatchewan. About 1,400 are life members who have retired.

Then, there are about 1,300 corporate registrations of firms for which APEGS issues certificates of authorization. They are required of companies that offer services to the public and/or their customary function is engineering or geoscience. An APEGS member must take responsibility for the company to receive a certificate of authorization.

Maintaining one's licence

Wimmer went through the three requirements of members to be able to maintain their licence with APEGS and be considered a member in good standing. First, they must act ethically. Second, they must pay their annual fees. Third, they must comply with the annual requirements for continuing professional development.

It is a member's responsibility to meet these requirements to maintain their registration. For example, paying your dues on time. Those who fail to pay by January 31 in the year in which they are due can find their membership ceased. Each year, about 700 members cease each year because they did not pay their dues. He explained it is better to resign in good standing than not pay.

Wimmer also explained licence waivers, saying those who hold them can not hold employment at that time. If someone with a licence waiver returns to work in engineering or geoscience later in the year within Saskatchewan, they can inform APEGS and pay a prorated fee to reinstate their licence.

Having a code of ethics sets the standards for behaviour and reassures the public that standards exist and are being enforced. This code is binding and enforceable and is something all members should understand.

The protection of title and scope of practice

This is covered in sections 26 and 27 of the *Engineering and Geoscience Professions Act*. Only members and licensed professionals can engage in engineering and geoscience and use the protected titles of P.Eng. and P.Geo. A person cannot imply they have professional status when they do not. That would be a violation of title. This includes members-in-training are to work under supervision, so, they receive the training and complete the competencies to become eligible to achieve status. Once they are competent, they can be called up to practice independently.

Wimmer also covered the use of seals, which is a mark to indicate the work of a professional. It is a visible commitment to standards and is used to support authenticity and integrity of documents. He encouraged members to retain the original sealed document for as long as liability exists because an error could potentially be discovered many years after project was completed.

As a professional, engineers and geoscientists have an obligation to meet the continuing professional development (CPD) requirements for the professions, which includes participating and reporting. This learning is a lifelong endeavour by members to ensure they have going competence. Technical and specialized fields always change and knowledge evolves over time. It is another way the public can be assured that professionals are competent and practice ethically. APEGS has a framework for its CPD so members can establish what they know and what knowledge and competencies do they want to develop and maintain throughout their career.

There are timelines for meeting the annual requirements and reporting compliance to APEGS. Members have between January and December in a year to complete their requirements. They must then submit their reporting about their activities during the prior year by January 31 of the current year. For example, the deadline for 2023 reporting is January 31, 2024. However, APEGS' member portal allows members to update their records for CPD reporting at any point through the year.

Chris Wimmer, P.Eng., FEC, FGC (Hon.), APEGS' Director of Professional Standards, was the initial speaker at the inaugural "Practicing the Professions" event held in Saskatoon in late October.

Using the member portal

Wimmer explained that the member portal is a very basic system that accepts whatever number a member submits. It is up to the member to identify they are compliant because the system does not verify their compliance for them. Members who live outside of Saskatchewan are not required to duplicate their reporting through all jurisdictions where they are licensed. They can simply report to APEGS their primary jurisdiction and fulfil their annual requirement of the regulator for that area.

These apply to all members except for temporary or lifetime members. The exact requirements of each member depends on their licensure status.

However, most members who are licensed are required to get 80 credits across three categories plus participate in one hour of ethics training each year. Wimmer said many members earn more than 80 credits and that extra credits can be rolled over two years into the future.

The one-hour of ethics training can be obtained through APEGS events that focus on ethics or through ethics meetings at work or as part of committee meetings. It can also be obtained through participating in modules on APEGS' website under CPD in the site's menu.

Another category is professional practice. Fifteen hours of professional practice within the member's scope of practice equals one credit. Members may claim a maximum of 50 credits per year in this category.

Formal activity is another category and includes activity such as attending a professional development event where you are graded or receive a certificate for completing. An example of this would be a first aid course. But there may also be other types of courses, including ones through universities. Members may claim a maximum of 30 credits per year in this category. Every hour spent attending a course equals one credit. This includes for post-secondary studies in class or a lab. For courses offering Continuing Education Units, each CEU equals 10 credits.

A third category is informal activity. Activities in this category can include self study, reading a technical magazine, lunch and learns, watching or listening to videos and podcasts.

Participation is another category which requires members to actively serve. They can participate by serving on a committee or by mentoring or volunteering. This activity can include community service, such as sports or church activities. This category is calculated by each hour of service equalling one credit. Up to 10 credits can come from community service activities with a maximum of 20 credits for this category.

Another category is presentations. Members must verify they did a technical or professional presentation. The hours they dedicate to preparing the presentation as well as delivering it can be counted with each hour equaling one credit with a maximum of 20 credits for this category.

The final category is activities that contribute to the technical knowledge base of the public as well as the professions and students. Examples include contributing to developing codes and standards, registering patents, or publishing a paper in a peer-reviewed journal. The amount of credits earned varies depending on the activity the member completed. A maximum of 30 credits can be claimed in this category.

Changes to CPD program

Wimmer explained that the CPD program is changing with new bylaws in place. In 2024, the category of professional practice will be removed, reducing the number of categories to five. The program will evolve to emphasize a minimum amount of verifiable activity and credits. Members will be required to obtain and report 30 credits – instead of 80 — over two categories instead of three. This will mean APEGS will have similar requirements to other jurisdictions.

He explained this is part of other changes to the Act and bylaws. A committee is undertaking that review and proposing changes to modernize them. There are sections that are hindering APEGS' ability to properly regulate, Wimmer said. He encouraged those present to pay attention to the process and watch for announcements in the future.

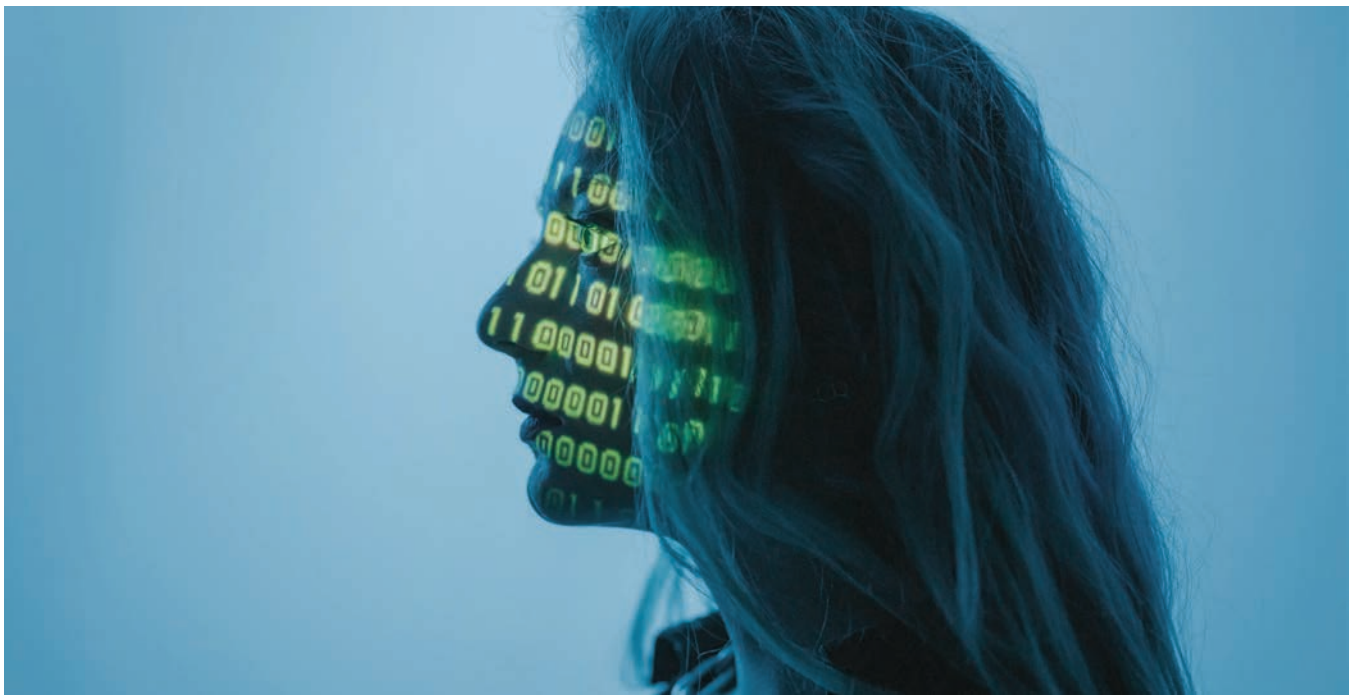
New Volunteer Opportunity – Member-Led Webinars

Are you an APEGS member who is an expert in your field? Do you want to share your expertise with fellow members? APEGS is looking for volunteer presenters for monthly member-led webinars starting in 2024. For more information or to volunteer, please contact the CPD Department at cpd@apegs.ca.

AI Ethics

Navigating Bias in the Digital Age

BY MARTIN CHARLTON COMMUNICATIONS



The excitement around artificial intelligence is greater than its capabilities at this time and people must remain cautious and curious as the technology rapidly evolves so we can learn and decide how to use it appropriately.

AI is more than a wave of technology, Ramy Nassar explained, saying it will fundamentally change what every profession does. During his presentation "AI Ethics: Navigating Bias in the Digital Age," Ramy Nassar provided some foundational information about AI before explaining the risks AI presents as well as how those risks could be mitigated.

Nassar is an author and award-winning keynote speaker and facilitator who helps organizations leverage the transformative power of AI + Emerging Technology and Strategic Foresight. With nearly 25 years experience in technology and as the former Head of Innovation for Mattel, he leads presentations and workshops with organizations around the world to drive innovation and transformative growth.

With a background in computer engineering and Design Thinking, Nassar has straddled technical, design and business-oriented roles, for clients including Cadillac Fairview, Apple, Air Canada, Facebook, New Balance, Rogers and CIBC. He is a regular speaker at international events including World Usability Congress, IxDA, Machine Learning Exchange, AI Business Summit and Mobile World Congress. Nassar teaches Design Thinking at McMaster University as well as guest lectures on a range of topics at Toronto Metropolitan University (formerly Ryerson) and the University of Toronto. He has been recognized as a top 40 under 40 award winner.

The abilities of this technology are accelerating faster than any one human can manage, Nassar said, with opportunities appearing for engineers and geoscientists to leverage this technology in their work. Monitoring infrastructure health, design automation, advanced simulation, safety and risk management, enhanced exploration and surveying, human resource management and other internal functions to a company are some that have significant promise.

Ramy Nassar

But these opportunities come with specific risks, for which he offered some mitigation strategies. First, the maturity of this technology should be contextualized. Not doing so presents a risk. Another risk is there is a massive challenge for organizations' leaders to balance the hype with real business uses. Still another is that there are data privacy and protection issues.

Risk of incorrect and biased information

Each is a major area to be explored and considered, but Nassar focused on the risk presented by incorrect and biased information. AI's algorithms rely on large amounts of data, which can contain biases from humans. There is the potential for AI to not only reflect our biases back to us but amplify them. How do we ethically and responsibly use AI when there is bias within the data it uses?

There are mitigation strategies to manage these risks. He encourages humans to recognize and understand our biases. Engineers and geoscientists specifically should recognize the specific risks biases can create when practicing their professions and what competencies are needed to avoid these risks.

AI in decision-making

The biggest challenge he sees with AI today is leaders getting excited about using AI to solve a problem but not having an unbiased set of data to train the AI's algorithm. Output based on flawed or biased data won't be appropriate or beneficial. Nassar would advocate for humans to be in-the-loop when it comes to working with AI, saying we can't yet trust the algorithms of AI to decide on our behalf – even if it does make the right decision 99 per cent of the time.

There needs to be accountability for the decision, Nassar said, pointing to people not being prepared to blame an algorithm. The public's response to humans being hurt in incidents involving autonomous vehicles demonstrates this, Nassar explained. Even though there is a lower rate of fatalities associated with them compared to human-driven vehicles, humans blame the company behind the technology when there is an incident of a human being harmed. Humans are expected by the public to be accountable for decisions made by technology.

Moving forward responsibly

So, what do we do about this situation we now find ourselves in with this technology? Nassar encourages humans to look beyond the advancement of technology to measure our success. It is important to develop skills and competencies, but what is most important to him is curiosity. Knowing the right questions to ask is more valuable than having the right answers because good questions will help us develop better mitigation strategies.

By asking questions, we will see issues in the data that should cause us to limit its use. We can identify gaps in the data sets we plan to use. We will see when data is being over- or under-sampled to be able to see what most contributed to the algorithms' outputs. The technology will require continuous validation and testing as well as cross-validation plus testing done in the real world. We need stakeholder collaboration and feedback that provides diverse perspectives as well as inclusive feedback loops.

Nassar said we should be able to explain what the technology is doing and how it arrives at delivering its output. He points to a need for ongoing education and training as changes occur and he encourages ethical review boards be involved in approving the use of AI. He reminds us of sentiment shared by Fei Fei Li. That is that AI does not have a conscience, but we humans do, so it is our responsibility to ensure it is developed and deployed ethically.

https://speakerscanada.com/keynote-speaker/ramy-nassar/

Ramy Nassar at the "Practicing the Professsions" event presenting on "AI Ethics: Navigating Bias in the Digital Age."

Ethical Situations

from the Perspective of the Engineering Co-op Internship Program

BY MARTIN CHARLTON COMMUNICATIONS

Thinking through the ethical situations faced by engineering students from the University of Saskatchewan and their employers was the focus of the presentation by Tracy McArthur, P.Eng., the Co-op Co-ordinator for the College of Engineering at USask. But she first provided a framework for ethical decision-making to navigate such situations.

McArthur shared an equation she uses to determine if a situation has ethical considerations. That equation is character + behaviour + right and wrong = ethical situation.

She encouraged people to view themselves holistically – as complex beings who are constantly learning surrounded by other complex beings on their own learning path in a world that is constantly evolving. She pointed out that discussing ethics is not always easy and requires compassion for oneself and others around you. Through that consideration, there are certain questions she would encourage be asked.

One of those questions is who decides what is right or wrong? Finding an answer to that question is made easier when there is a code of ethics to consult. A code of ethics identifies standards of conduct and is a support when making decisions. It can be a means of explaining why you must make the decision.

She pointed to the *Engineering and Geoscience Professions Regulatory Bylaws* in Saskatchewan, highlighting section 20 which explains that the code of ethics is to guide members' conduct and way of life, which would include how each member moves through life. Subsection 2 describes some values, characteristics and behaviours.

She also pointed to Engineers Canada's code of ethics, drawing attention to one line about interpreting the code. "The ethics of the profession is an integrated whole and can not be reduced to fixed rules." Another line that stood out for her is this one: "A more appropriate use by practicing professionals is to interpret the essence of the underlying principles within their daily decision-making

situations in a dynamic manner, responsive to the needs of the situation."

Underlying principles behind ethical behaviour

McArthur has identified five underlying principles: respect for life, competence, honesty, integrity and fairness. Respect for life is about serving people and the environment. It is being concerned about the safety, health and welfare of the public and the environment. She says that is not unlike the guiding principle of Respect within The Seven Sacred Teachings of many Indigenous Peoples... Even though engineers are taught to be intellectual and to rely on calculations, there is the notion of giving from the heart without expecting a return.

Competence, the second underlying principle, is about practicing only in the area where one has the necessary ability, knowledge, or skill to be successful. That requires one to be up to date on developments and knowledge in the area of competence and to obtain the services of a specialist when required. This would also include contributing to the knowledge of the industry and helping others to become more competent – such as students.

Honesty is the third underlying principle, which is about being truthful, sincere, open and trustworthy. Integrity, the fourth underlying principle, requires engineers to do the right thing despite the cost. It is about being accountable for your actions and reporting unethical engineering activities undertaken by others. Fairness, the fifth and final underlying principle, is about being impartial and delivering just treatment or behaviour without favouritism and discrimination.

Finding an ethical decision-making model

What McArthur had been looking for in her own career was an ethical decision-making model. She found one as she completed a Certificate in Career Development and Academic Advising delivered by the University of Calgary that included a course on Ethics for Career Development Professionals. She provided that model to those listening. It is made up of eight points, which are:

1. Recognize that an ethical dilemma exists.
2. Identify the relevant issues and parties involved.
3. Considering the underlying principles.
4. Consider potential solutions.
5. Examine risks and benefits of each alternative.
6. Re-visit the Code of Ethics and underlying principles – and get help if needed.
7. Choose the plan of action.
8. Evaluate the results.

She also offered a "quick check," which is three questions.

1. Would you want the decision announced publicly?
2. Would you make the same decision for everyone?
3. Is everyone being treated fairly by the decision?

Tracy McArthur, P.Eng., the Co-op Co-ordinator for the College of Engineering at USask, said she appreciated the opportunity to speak to more senior engineers about working with students who will be learning from them during their work terms, particularly about how to conduct themselves ethically.

Students navigating ethics

She provided examples of situations brought forward to her, most often by students, about their experiences in their co-op work terms.

In the first situation she shared, she said a student had been hired by an employer who committed to the student that the first half of their placement would be with one group in their organization and the second half would be in another. But when the halfway point was reached, the student was not moved, which frustrated them. Another student hired by the same organization wanted to stay where they were within the organization, which impacted the first student.

When the student shared their experience with McArthur, she used the ethical decision-making model to think it through. She went back to the five underlying principles. Of the five, she focused on honesty, integrity and fairness. The first student was told one thing would occur but it didn't. The placement was to provide the student an opportunity earn experience. They paid tuition and were not getting what they had been led to believe they would receive. Finally, one student's decision was impacting the first student, which was not fair.

In another situation, a student told her that results of water sampling were not recorded in a logbook because they did not meet standards. In that situation, McArthur looks at the principle of respect for life, saying that respect was not demonstrated. In another situation, it was not a student who reached out to McArthur, but their parent who was concerned the student was not getting adequate experience during their co-op work term. The parent felt the student was being taken advantage of by the employer but did not share with the student that they were contacting McArthur. In that situation, McArthur was initially not sure what to do, but ultimately advised the parent to speak to the student and encourage them to call her office. She also knew that her office would be visiting the workplace of the student and could see if the parent's concerns were shared by the student.

McArthur went on to present several more ethical situations and identifying which underlying ethical principle was involved with each situation.

Acting as a mentor to students

Having the opportunity to speak to those at this event pleased McArthur because those who attended will be hiring future engineers. She stated the importance for more senior engineers to remember that students and younger engineers have questions and learn from interacting with those with more experience. Most ethical situations she encounters involve questions about honesty, integrity and fairness.

She congratulated those who hire students and treat them well by providing them support and mentorship, saying they are going to be their colleagues soon. She encouraged all to live by the principles in the code of ethics and bring them in their professional practice, while recognizing that while mistakes can happen, taking accountability for those mistakes matters, too.

Does Your Next Meeting Need an Ethics Topic?

Monthly ethics moments are available to APEGS members for use in meetings. When an ethics moment is included in the minutes of a meeting, along with the start and end times of the ethics moment discussion, this time can count as part of the member's annual ethics requirement. If you would like this month's ethics moment, please email cpd@apegs.ca.

MASTER OF BUSINESS **ADMINISTRATION**

Transition from technical, engineering and project management to more strategic roles in business and leadership with the Edwards MBA. **edwardsmba.ca**

- Full or part-time program
- Immersive in-person classes
- GMAT is required*
- $100,000 annually in scholarships
- Start in Aug. 2024

Ladder your way to the Edwards MBA with the Graduate Certificate in Leadership.
edwards.usask.ca/leadership

EDWARDS
SCHOOL OF BUSINESS
UNIVERSITY OF SASKATCHEWAN

TOGETHER

*While a minimum GMAT score of 500 is required, it may be waived if you hold the P.Eng. designation. Evidence of the P.Eng. licence is required. Contact us at 306-966-8678 or mba@edwards.usask.ca to see if you qualify.

Act and Bylaw Review

APEGS is engaging in a review of the *Engineering and Geoscience Professions Act* and associated bylaws. The act and bylaws have not been reviewed since 1997. Review is important to help us regulate the professions more effectively. With the introduction of the *Labour Mobility and Fair Registration Practices Act* in May 2022, the time is right to evolve our processes and increase our responsiveness.

We are not alone. Other provincial professional regulators in Saskatchewan and engineering and geoscience regulators throughout Canada have gone or are going through the same changes as APEGS.

Themes of Change

1. **Simplify:** Move specifics from the act to bylaws and procedures
2. **Modernize Terminology:** Use terminology that is inclusive and easily understood by the public and reflects our role as a regulator.
3. **Expand Entity Regulation:** Give APEGS scope to audit and enforce standards of practice and investigate and discipline business entities, in addition to individual registrants.
4. **Increase Public Representation and Accountability:** Increase involvement of public representatives in the governance of APEGS and enhance our accountability to the public.
5. **Modernize Registration Framework:** Ensure registration categories and processes reflect current public expectations of inclusivity, fairness, transparency and timeliness.
6. **Improve Efficiency, Effectiveness and Transparency of Governance Processes:** Improve the ability for the council to represent members and maintain strategic oversight, while empowering the executive director and registrar to manage operations through a cohesive bylaw and policy framework, ensuring that the public understands what APEGS is doing to regulate in their best interest.
7. **Investigation and Discipline Transparency:** Improve transparency of processes and provide clarity on roles of APEGS, council and public. (Potentially develop an appeals committee separate from council.)

Schedule

September 2023 to November 2023 – review the act and bylaws and note desired changes, consulting with the Minister in the process

December 2023 – Provide Minister with draft amendments

January 2024 to May 2024 – Work with Minister to develop the draft legislative proposal

May 2024 to December 2024 – Stakeholder engagement

January 2025 to August 2025 – Prepare decision item for cabinet approval

September 2025 to December 2025 – Introduce bill through to royal assent

Commitment to Ongoing Communication

The task group will keep momentum and continue with our original thinking of reviewing and recommending changes and pass along to government to carry out their legislative process.

Watch for updates on progress through outreach channels: *The Edge Monthly* e-newsletter (emailed on the 15th of each month or next business day), *The Professional Edge* print magazine (mailed in June and December).

Notes from APEGS Council

The council meets four times a year to govern the affairs and business of APEGS. A record of council decisions is available on our website within two weeks after the meeting. To view the records of decisions visit our website under About/Governance.

Governance Evolution

We continue to evolve APEGS' governance structure to ensure appropriate lines of sight between committees and the council. The goals in realigning governing committees are to minimize redundancy in decisions, better manage the flow and timing of information, and improve transparency.

Currently, the council, which is comprised of elected members plus two public appointees, has three boards report to it – the Regulatory Board, the Professionalism Board, and the Governance Board. Each board has its own committees with volunteers. Committees submit recommendations through the appropriate board, which are the submitted to the council.

The next step on our governance journey is to distinguish committees as either operational or governance and align them accordingly. For example, operational committees, such as the Academic Review Committee and Experience Review Committee, would report to the executive director and registrar and staff who deliver the day-to-day operations. The governance committees and functions, such as the Audit and Risk Management Committee and the Nominating Committee, would answer the council.

Since the council would have a clear line of sight to the governance committees, the Governance Board would be stood down. APEGS anticipates these changes to occur following the annual meeting in May 2024. APEGS will work on the operational structure in 2024 and 2025 with the intent to implement changes following the annual meeting in May 2025. This phased-in approach aligns with the evolving clarity regarding the roles and responsibilities of the council, executive director and registrar, and volunteers.

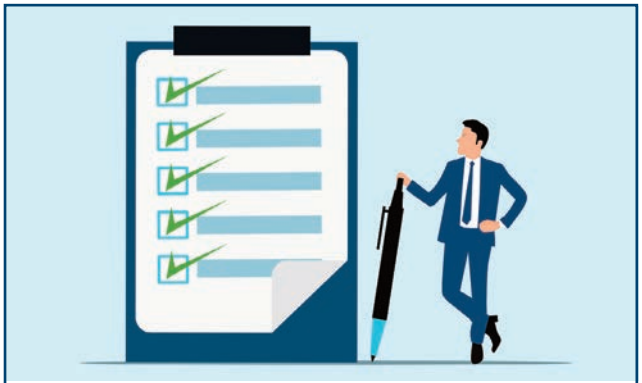
2023 Disciplines

In 2023, the Discipline Committee issued decisions and orders relating to one case. A panel of the committee found Scott Gullacher guilty on three counts of professional misconduct relating to the RM of Clayton's Dyck Memorial Bridge, and five municipal bridges, one located in each of the RMs of Scott, Caledonia and Mervin and two located in the RM of Purdue.

The decision and interim order were issued on January 24, 2023 and the final decision and order were issued on July 12, 2023. They can be found on the APEGS website under Complaints and Enforcement, Discipline Hearings & Notices.

Continuing Professional Development

The Continuing Professional Development (CPD) Program requires APEGS members to complete ongoing professional development activities to maintain and improve their competence. It encourages members to engage in lifelong learning to protect public health, safety, and welfare. The program provides tools for members to assess their current skills, knowledge, and abilities, determine activities to maintain or enhance them and report completed activities online to APEGS as professional development credits. For more information, navigate to the CPD menu at apegs.ca.



CPD Program Changes Coming in 2024

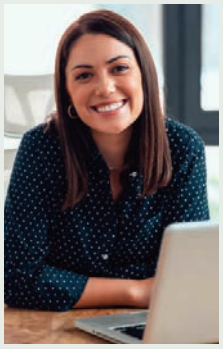
We are excited to announce that the CPD Program is undergoing some improvements that will take effect for the 2024 CPD reporting cycle. These include:

- A reduction in the number of credits needed each year
- Revisions to the list of CPD activity categories

We will share more details about these changes in 2024. Keep an eye on your inbox for updates!

Attention Licence Waiver Holders!

Members who hold a licence waiver for the entire year require a minimum of **30 credits obtained outside of professional practice** including one hour of verifiable ethics training, which can be claimed under Formal Activity as part of the 30 credits.



CPD Tip

The 'Reporting Elsewhere' option

Do you live outside of Saskatchewan? Are you also reporting professional development activity to another Canadian engineering or geoscience regulator?

If yes, you are eligible to report to APEGS using the 'Reporting Elsewhere' option. This is a quick process, but it must be completed on an annual basis. For a guide on how to complete this process, please visit our website and navigate to the **CPD/CPD Program Documents** webpage and scroll down to the **Reporting CPD** heading.

Do You Need CPD Coaching?

One-on-one coaching is available to any member looking for additional information about the CPD Program. Contact the CPD Department at cpd@apegs.ca to book an appointment.

CPD Reporting Deadlines

Members are reminded of the following CPD deadlines:

December 31, 2023 - Deadline to earn credits for 2023 and obtain 2023 ethics training

January 31, 2024 - Deadline to report your CPD information online to APEGS.

Online Ethics Modules

APEGS has free one-hour online ethics modules available to assist members in obtaining their ethics credit for the year. The modules are not mandatory and are offered as one option available to members.

Our current ethics module topics are:

Module 1 – Professionalism and Ethics

Module 2 – Conflict of Interest

Module 3 – Investigation and Discipline

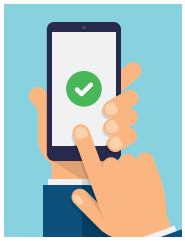
Module 4 – The Ethics of Continuing Professional Development

For more information and to access the modules, please visit the CPD menu at apegs.ca.

2024 Membership and Licence Fees Now Due

Fees notices were mailed in mid-November

It is the responsibility of members and the official representative for a Certificate of Authorization to make sure contact information is up to date, including your email address. If you do not receive your fees notice, contact APEGS. Annual fees for 2024 are due by December 31, 2023. Payment must be received prior to January 31, 2024 at 5:00 pm (CST) to avoid being ceased as a member.



How do I pay my fees?

Log into APEGS Central (member online profile) by clicking "Login" in the top right corner on any page of the APEGS website. If you have never used the system before, click on "Forgot your password" and follow the instructions.

Even if you are mailing a cheque or your company is paying for you, please click on "Pay Now" in APEGS Central to be guided through updating your profile. You can also use your profile to make all other fee payments, enter Continuing Professional Development (CPD) credits, renew Permission to Consult, manage your email/mail subscriptions and volunteer with APEGS.

What happens if I do not renew?

You would no longer have the privilege of practicing engineering or geoscience on projects or properties within Saskatchewan. Use of title in Saskatchewan is also a privilege of membership.

Members who do not retain their membership in APEGS and/or in another Canadian association will lose coverage under the National Secondary Professional Liability Insurance Program. Also, failure to maintain your membership will result in ineligibility for benefits under the group life insurance program offered through Manulife and Engineers Canada if you have subscribed to this insurance.

What if I am not working in Saskatchewan?

Members who are retired or not working (at anything) in Saskatchewan can retain membership and may be eligible for a waiver of the annual licence fee. The Licence Waiver Application Form is available on the APEGS website under Members/Application Fees & Licence Waiver.

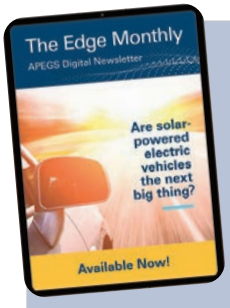
What if my membership ceases and I need to reinstate?

Memberships that have ceased are subject to a 15 per cent fee to reinstate in the same calendar year. Members who notify the APEGS office in writing of their intent to resign their membership on or before January 31, 2024 may reinstate their membership and licence during the calendar year without the payment of a reinstatement or application fee. The late payment penalty for the holder of a Certificate of Authorization is 15 per cent of the annual fee.

For reinstatement procedures for subsequent calendar years, see the APEGS website under Apply.

Eligibility for Life Membership

Members who are 65 years of age or more and retired are eligible to apply for Life Membership. The Life Member Application Form is available on the APEGS website under Members/Life Membership.



READ *The Edge Monthly* e-Newsletter

APEGS introduced *The Edge Monthly* e-newsletter in August 2022 as a source of timely and relevant information for members about matters relating to licensing and regulating the engineering and geoscience professions. Look for an email from APEGS at communications1@apegs.ca on the 15th or next business day of each month.

If you are not receiving the e-newsletter:

- Check your junk folder.
- Ensure you are subscribed.
  1. Log into APEGS Central.
  2. Go to My Profile / Summary / Communications.
  3. Check "APEGS informational emails."
- Contact the APEGS office for assistance.

It has been a year since we introduced the e-newsletter, so it is time for a review. We are surveying the participants of APEGS Connect, the survey panel of 1,000 APEGS members and will be making changes based on the results of the survey.

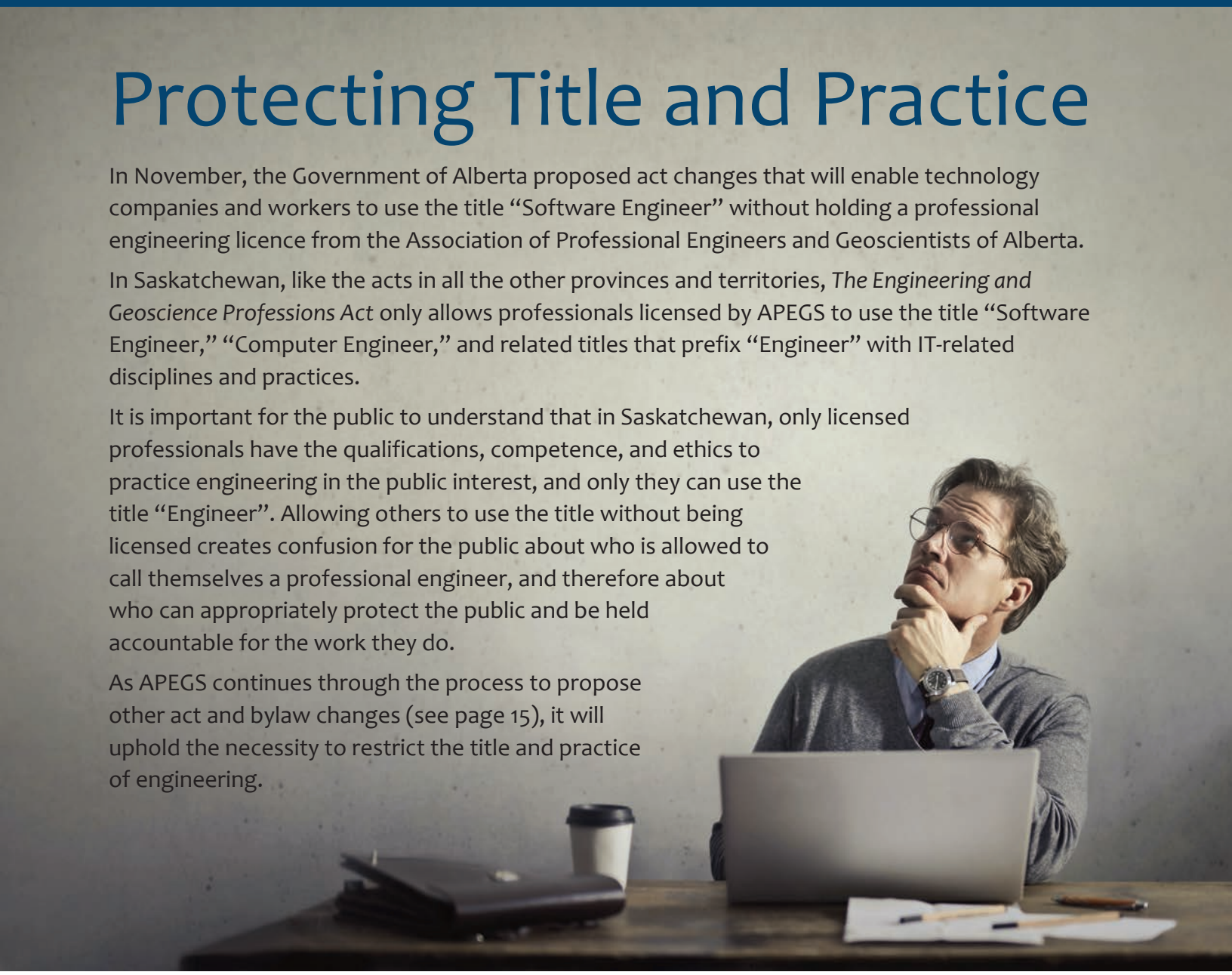
Protecting Title and Practice

In November, the Government of Alberta proposed act changes that will enable technology companies and workers to use the title "Software Engineer" without holding a professional engineering licence from the Association of Professional Engineers and Geoscientists of Alberta.

In Saskatchewan, like the acts in all the other provinces and territories, *The Engineering and Geoscience Professions Act* only allows professionals licensed by APEGS to use the title "Software Engineer," "Computer Engineer," and related titles that prefix "Engineer" with IT-related disciplines and practices.

It is important for the public to understand that in Saskatchewan, only licensed professionals have the qualifications, competence, and ethics to practice engineering in the public interest, and only they can use the title "Engineer". Allowing others to use the title without being licensed creates confusion for the public about who is allowed to call themselves a professional engineer, and therefore about who can appropriately protect the public and be held accountable for the work they do.

As APEGS continues through the process to propose other act and bylaw changes (see page 15), it will uphold the necessity to restrict the title and practice of engineering.



Why do I need to be licensed with APEGS?

Professionals engaging in engineering or geoscience work in Saskatchewan must be licensed. The government of Saskatchewan has granted engineering and geoscience professionals the privilege and the responsibility of self-regulation as APEGS under the authority of The Engineering and Geoscience Professions Act. APEGS licenses and regulates approximately 15,000 engineering and geoscience registrants.

Being licensed allows the public to be confident that engineers and geoscientists have the qualifications, competence and ethics to protect the public interest and the environment. It also means that engineers and geoscientists can be proud of belonging to professions with a reputation for excellence and a commitment to enhancing the quality of life, health, safety and well-being of all Canadians.

Member Profile

Amira Abdelrasoul, Ph.D., P.Eng.

What is your personal background (hometown, schools, family, etc.)?

Originally from Egypt, specifically Alexandria, I had the privilege of growing up in a coastal city. Growing up by the ocean, with its endless horizon symbolizing unlimited possibilities, has profoundly shaped my perspective on life and career. This experience has significantly influenced my life and aspirations, teaching me to embrace challenges with a sense of adventure and to approach my career with a mindset of endless possibilities and growth.

Why did you choose engineering and what is your area of specialty?

Several experiences sparked my interest in chemical engineering. My dad was a chemist, my brother is an engineer and most of my family members are either chemists or engineers. I was inspired by their experiences and I wanted to combine both fields as a chemical engineer to gain a broader vision. I was interested in making a real impact and becoming the kind of engineer that the world needs. I was particularly interested in exploring critical problems and synthesizing new materials, especially for the biomedical field.

Where and when did you study engineering/get your degree and how would you describe your experience?

I earned my Bachelor of Science (B.S.) in Chemical Engineering from Alexandria University in Egypt. Following that, I pursued my Master of Science (M.S.) in Chemical Engineering at Kuwait University, where I achieved an exceptional cumulative GPA of 4.00/4.00. Subsequently, I completed my Doctor of Philosophy (PhD) in Chemical Engineering at Ryerson University (currently Toronto Metropolitan University) in Toronto, Canada, with an outstanding cumulative GPA of 4.33/4.33. My PhD thesis focused on membrane science and technology. Each of these educational experiences has been instrumental in expanding my knowledge, skills and career. I particularly cherish my undergraduate experience in Egypt, as it provided a comprehensive fundamental program that equipped me with the essential knowledge I continue to apply in my work. I am deeply proud of my PhD, which holds a special place in my heart due to its significant impact. My academic journey was marked by notable achievements, including the prestigious Governor General Gold Medal, the most prestigious academic honour in Canada and the Outstanding Doctoral Thesis Award in recognition of my exceptional research contributions.

What jobs/roles have you held as an engineer?

I've had the privilege of holding various engineering roles, gaining exposure to diverse experiences in different countries, including Egypt, Kuwait and Canada. I've worked in both academic and industry settings, which have provided me with a unique blend of experiences. In the academic environment, I actively engaged in teaching, research, academic activities and collaborative projects that utilized different software and advanced technologies. In industry, I gained significant experience as both a product development engineer and a polymer process engineer, with a primary focus on research and development, material sciences and nanotechnology. These diverse experiences have equipped me with a broad skill set and a profound understanding of engineering principles.

What have you appreciated about your career opportunities and experiences?

I've appreciated several aspects of my career opportunities and experiences, but one that stands out the most is my ability to contribute to problem-solving. The most rewarding facet of my work, particularly in research, is the direct impact it has on improving the lives of individuals, especially kidney-failure patients. It's an incredible privilege to be part of the efforts to find solutions to critical health problems. Knowing that the research and work I do

Member Profile: *Amira Abdelrasoul*

may help enhance the quality of life and potentially save lives is both motivating and inspiring. This sense of purpose has been a driving force throughout my career and it's deeply gratifying to see how our contributions can make a significant difference in the lives of those who need it most. This appreciation for the real-world impact of my work continues to inspire me in my professional journey.

Who has inspired or mentored you in your career? What insight or wisdom did they impart?

Throughout my career, I've been fortunate to have the support and guidance of great mentors in the field of chemical engineering. These mentors have provided me with invaluable insights and wisdom that have profoundly shaped my career path. Their continued mentorship has been instrumental in my professional growth and I deeply value the ongoing support that I always receive from my mentors who believe that learning doesn't end with a degree. This belief has driven me to launch and chair a Women in Engineering chapter in 2018 to promote and support the success of female undergraduate and graduate chemical engineering students at University of Saskatchewan.

What activities or interests do you enjoy outside of work?

What I enjoy the most is my time with my kids and the fun we have together. These moments not only provide a break from the demands of work but also serve as a source of inspiration and motivation to recharge my positive energy.

Anything else you want to say?

In closing, I'd like to add that I'm incredibly proud of my journey as an engineer. Throughout the years, I've had the privilege of working on projects that have not only expanded my technical expertise but have also allowed me to contribute to meaningful solutions especially when it comes to helping kidney failure patients. Looking ahead, my aspirations as an engineer in my research program are boundless. I'm passionate about staying at the forefront of innovation within my field and continually pushing the boundaries of what's possible. My ultimate goal is to create an artificial wearable kidney based on filters compatible with the body to help kidney-failure patients and solve dialysis problems.

Council Election 2024

Important Dates:

The Nominating Committee confirms nominees by January 19, 2024.

Nominees are announced on February 20, 2024.

Voting for the election opens March 11, 2024 and closes on polling day, April 8, 2024.

The new council is inducted at the annual meeting on May 4, 2024.

Member Grants

Through the University of Saskatchewan and the University of Regina, APEGS offers six merit-based grants of $7,500 each to encourage existing APEGS members to further their education in engineering or geosciences or attain an MBA.

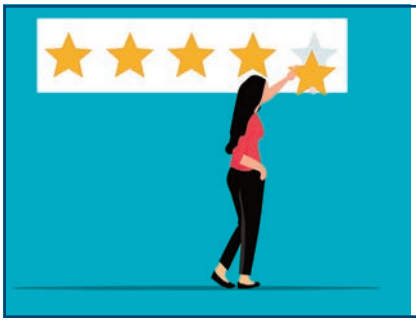
Eligibility requirements

Members returning to post-graduation studies at either university in the field of engineering or geoscience or for an MBA program are eligible to apply. Applicants are evaluated in the following areas:

- Accomplishments in the practice of professional engineering or professional geoscience which indicates exceptional potential.
- Demonstration of leadership, volunteerism and community involvement.
- Service to the professions in public education, understanding the role of professionals in society and/or active participation in engineering/geoscience associations, societies and institutes.
- Reasons for pursuing the post-graduate degree, goals, personal statement, how their studies will contribute to the professions.

How to Apply

Applications may be sent to APEGS any time throughout the year. Applications received by Dec. 31 of each year are considered and awarded early the following year. Go to www.apegs.ca and select Member Grants under the Members menu for the application form and more information.



Members' Perspective of APEGS Survey

APEGS will be conducting a short member survey to find out what members think about APEGS. The 1000-member survey panel, APEGS Connect, has already been invited to respond to the survey. APEGS is asking additional members to participate to ensure we have as many responses as possible. Keep an eye out for a request in the January e-newsletter to participate in the survey.

Celebrating Our Own

Allyson Desgroseilliers, P.Eng., to lead Association of Consulting Engineering

Canada Newswire - Allyson Desgroseilliers, P.Eng., was named Chair of the ACEC Board of Directors for the 2023-2024 term at the ACEC annual general meeting on Oct. 11.

Desgroseilliers is the Vice-President of Environmental Management for Earth & Environment, Prairies and North at WSP Canada. She is a Professional Engineer registered in Manitoba and Saskatchewan.

She joined the ACEC-Canada Board in 2018 and served as Treasurer as well as chair of its Planning and Governance Committees. She is also a past-chair of ACEC-Manitoba.

Desgroseilliers believes climate change is important as is the long-standing and critical role of ACEC and its member companies in addressing economic, societal and environmental challenges facing Canada.

"In light of devastating wildfires, heat waves, floods and the incredible impact this has on our built and natural environments, it is not only urgent to address these challenges but also to ensure that we move toward a net-zero future in a sustainable and ethical way," Desgroseilliers said.

Desgroseilliers cited the long-awaited National Infrastructure Assessment as an advocacy goal.

"This will ensure a strategic and long-term approach to planning new and replacing existing infrastructure that will meet Canada's needs. Climate change and resiliency are life-cycle challenges that require life-cycle solutions."

PTRC receives Carbon Storage Award at national conference

SaskToday - The Petroleum Technology Research Centre (PTRC) was awarded the Carbon Storage Award at the Carbon Capture Canada Conference this fall for its work on the Aquistore deep saline storage project.

"PTRC is thankful for the acknowledgement of the importance of this pioneering project, with thanks to all our partners in demonstrating the safety and security of long-term geological storage of CO2 from SaskPower's Boundary Dam [carbon] capture [and storage] facility," the PTRC said in a news release.

The PTRC thanked the Government of Saskatchewan and Innovation Saskatchewan's support of its world-leading CCS initiatives and the commitment of its many research and development partners, universities and SaskPower employees that make Aquistore a globally-sought-after project for its data, expertise and knowledge.

"Aquistore has been a bell-weather project for years, demonstrating that CO2 can be safely and efficiently stored in a deep saline aquifer, thus reducing emissions from a coal-fired power station, but also demonstrating that safe and effective storage can assist many different industries, from steel to cement to power generation and refining," said Ranjith Narayanasamy, P.Eng., CEO and president of the PTRC.

The PTRC added that Aquistore is about to reach the milestone of 600,000 tonnes of stored CO_2.

Photo credit: ACEC-SK.

Russell Clunie, Sr., P.Eng. (left) receives the 2023 Mentor Award from Brett LaRoche, P.Eng., ACEC-SK Vice Chair.

Mentor awarded for sharing more than six decades of engineering experience

Russell Clunie, Sr., with Clunie Consulting Engineers Ltd. of Prince Albert, was named the recipient of the 2023 Mentor Award from ACEC-SK.

The Mentor Award honours a member firm employee credited by their mentees and peers for having provided valuable advice and support. Through a significant commitment of time and effort, the winner has contributed to the success and growth of their firm by building their mentees' professional skills and abilities.

Clunie has been in the industry for 63 years and is currently the owner of Clunie Consulting Engineers Ltd. Despite his numerous achievements and over 60 years of experience as an engineer, he remains humble and approachable, always willing to lend an ear and provide guidance. He considers mentoring among the most rewarding parts of his job. The lack of support when he first started is also why he has a strong desire to help others.

Six people nominated him for the award. This included Gord Broda and two of his sons.

“He has a strong message to deliver but delivers it in a very direct (and) efficient way. People absorb the information; they’re not scared to ask questions,” said Broda in a video produced by ACEC -SK.

Clunie embodies the essence of what it means to be a mentor. His technical abilities and deep knowledge of the industry are unparallelled. Clunie has seen many changes through his six decades of consulting work. He has seen vast improvements in technology and methodology and has adapted to take the most valuable lessons from the older ways and combine them with the newer methods.

Beyond his technical competence, Clunie's heart and leadership abilities set him apart as an exceptional mentor. Clunie’s door is always open and he is always open to questions or comments from anyone at the office.

His son, Clunie Jr., also provided his thoughts about his dad’s teaching style.

“He provides you with enough and expects you to go out and deliver,” he said.

Clunie's commitment to his team’s professional growth and development is evident in the support and trust he invests in each member. Under his mentorship, they are given the space, time and resources to reach their full potential as professional engineers. Clunie has always fiercely supported and defended the engineers who work under him.

Clunie treats his team like family. He goes above and beyond to ensure their well-being and success, regardless of the circumstances. Clunie's genuine care and concern for each individual fosters a supportive and nurturing work environment, enabling them to thrive both personally and professionally.

Clunie consistently demonstrates his dedication to excellence and upholds an extremely high level of ethics and standards in his work. His expertise serves as a constant source of inspiration and motivation for the engineers, technicians, draftspersons and surveyors at Clunie Consulting Engineers Ltd.

One of the most remarkable aspects of Russell's mentorship is his ability to pass along his vast engineering and construction knowledge while instilling these core values in others. The foundation on which Clunie has built his reputation and his company is one of integrity, honesty, dependability and a sincere concern for the people he works with, the clients he serves and the general public.

Clunie goes above and beyond to ensure that everyone he works with understands their responsibilities and can contribute effectively to the project's success. He possesses an extraordinary ability to assess and combine project requirements with client needs, project schedules and the various challenges encountered during design and construction. His calm, effective and sound decision-making has consistently resulted in the successful outcome of projects across Western Canada.

Photo credit: ACEC-SK.

Ryan King, ACEC-SK Chair, presents the 2023 Future Leaders Award to Carolyn Wright, P.Eng.

ACEC-SK awards Future Leaders recipient

Carolyn Wright, P.Eng., was awarded the Future Leaders Award by ACEC-SK.

Her early years in Saskatoon shaped her into a compassionate and driven individual passionate about helping others. She discovered that consulting engineering was the key to creating impactful change and providing communities with tangible benefits through engineering projects.

Growing up, Wright was very close with her father and grandfather, who are both civil engineers who own and operate Catterall & Wright (C&W), a Saskatoon-based municipal engineering firm.

She worked part-time during her summers as a high school student as a rod person for C&W’s surveyors, assisting in the field staking out sewer and water, sidewalks and streets and holding the rod for level and total station surveys.

After high school, she attained a biochemistry degree in 2009. Before starting her engineering studies, she travelled to South America for six months, visiting 10

countries in South America as well as Europe, Central America and Asia. She returned to study at the College of Engineering at the U of S, convocating with a bachelor's degree in civil engineering in 2015.

Wright started full-time as a project engineer with C&W in 2015. Since then, she has gained experience in design, project management and contract administration of projects within the municipal engineering field. Her areas of practice include pavement assessment and design, site grading design, storm sewer system and drainage design, erosion & sediment control review and asset management planning. She completed the Construction Contract Administration Course sanctioned by Construction Specification Canada and is in the process of becoming a Certified Construction Contract Administrator (CCCA). She received her Professional Engineering designation from APEGS in early 2023.

She goes above and beyond for her clients to ensure their voices are heard and considered. They see her as practical, reliable and trustworthy, which means her clients come back to her again and again for project management, design and construction services.

She currently serves as the Chair of the Careers In Consulting (CiC) Committee for ACEC-SK. Wright was instrumental in helping develop the Leadership Certification Program that the CiC rolled out in 2022.

Lieutenant Governor Meritorious Achievement Award goes to former APEGS president

Dwayne Gelowitz, P.Eng., FEC, FGC (Hon), was honoured with the Lieutenant Governor Meritorious Achievement Award.

Gelowitz has made and continues to make, very significant engineering and social contributions to the consulting engineering practice in Saskatchewan and in Canada. He is also a devoted family person and a caring humanitarian with great sensitivity to his colleagues and those less fortunate. His remarkable achievements in his career flow from his innate ability to meld these many facets and interests while achieving recognition as a respected consulting engineer.

Gelowitz excelled as a student at the University of Regina, graduating with a BSc in Environmental Systems Engineering before beginning a brilliant engineering career that started at SaskWater and progressed through several consulting companies. with ever-increasing levels of responsibility, to become Senior Principal Engineer, Infrastructure, at Clifton.

He is the "go-to person" in "all things water" in Saskatchewan. His advice is readily sought, particularly in the fields of water resources and infrastructure. The

Photo credit: ACEC-SK.

The Honourable Russ Mirasty, Lieutenant Governor of Saskatchewan, (left) presenting Dwayne Gelowitz, P.Eng., FEC, FGC (Hon), the prestigious Lieutenant Governor of Saskatchewan Meritorious Achievement Award.

lengthy list of projects demonstrates the breadth of that advice - from projects in towns, villages and First Nations to being the Lead Engineer on multi-billion-dollar irrigation projects or securing the appointment as Technical Adviser to the Lender on a billion-dollar irrigation investment in Alberta.

The engineering and investment community knows Gelowitz as an outstanding engineer, approachable manager, innovative designer and long-term thinker. He is an experienced engineering manager and team-player who works with each client to provide investors, in both the public and private sectors alike, with advice that yields best-value solutions.

Gelowtiz views the role of a consulting engineer to be that of providing advice to investors - a truly wealth-creating profession. His superior leadership and project management skills as a consulting engineer are evident in the remarkable progression of ever-increasing responsibilities for all manner of complex assignments. His ability to motivate multi-disciplinary teams and propose solutions underline his advanced judgment and decision-making skills.

He has spent his entire professional life practising, promoting, mentoring and otherwise improving the engineering profession in Saskatchewan and Canada. Gelowitz is an advocate of continuous learning in engineering, readily sharing his knowledge with clients and other members of the consulting fraternity through presentations at conferences and industry gatherings. As a

Principal Engineer at Stantec and Clifton, he has proven to be an active, hands-on teacher who is constantly coaching younger engineers and encouraging colleagues, by example, to participate in activities outside the office.

Gelowitz excels at leadership, both in the profession and in his community. He was continuously active in the Regina Engineering Society after graduation, joining the executive before he became a P.Eng. and was elected president in 1991. He was elected to the board of ACEC-SK, serving as a director for five years, chair for a term, followed by lengthy service as a committee chair and a national director of ACEC.

Then, he was elected to the APEGS Council, becoming President of APEGS for a term and a member of the Executive Committee for four years. During this time, he also served as a Director of Engineers Canada. For his service to APEGS and the engineering profession, he was awarded the Brian Eckel Distinguished Service Award, but he has served many other organizations in a similar fashion. Some of these are the Water Committee of the Saskatchewan Chamber of Commerce; City of Regina Purchasing Advisory Committee; Western Canada Water and Wastewater Association; and the Canadian Society of Civil Engineers.

Gelowitz has always stepped up when leadership has been required. He is a true "servant leader," putting organizational interests first, but fostering innovation and positive change in the organizations he serves. He continues to make a significant contribution to the profession and consulting industry through his commitment to multi-disciplinary teamwork, equity, respect and diversity, creating a welcoming environment that fosters young professionals to rewarding careers in consulting engineering.

For his overall achievements, he was named a Fellow of Engineers Canada (FEC) and an Honorary Fellow of Geoscientists Canada (FGC (Hon.)).

Gelowitz has also volunteered his time significantly to not only the profession of engineering, but also within the community as well, through the Knights of Columbus, church and coaching hockey. Gelowitz exemplifies service to the community and to the greater good of our city through his efforts, dedication and commitment.

Showcase Your Work in the APEGS' Annual Report for **2023**

The images in our annual report for 2023 will showcase the most recent work of Saskatchewan's professional engineers, engineering firms, professional geoscientists, and geoscience firms.

- Projects/work must be currently underway or been completed in 2023.
- Must involve registrants or companies registered with APEGS.
- Must be captioned with a sentence that explains the image and identifies any people within it.

Submit at least one high-resolution photo along with the description to apegs@apegs.ca.

News From the Field

Photo Credit: *Financial Review*

BHP considers nuclear energy for Jansen mine

Financial Review -- Nuclear energy is being considered by BHP to power its Jansen potash project to help the Australian mining giant achieve its net-zero emissions target by 2050.

The mix of energy sources for the mine would ultimately depend on SaskPower, Rag Udd, president of Minerals Americas at BHP, told The Australian Financial Review.

"We're pursuing carbon-neutral electricity at Jansen and aiming to get that by the mid-2030s and we are working closely with the provincial crown utility provider to look at several options and technologies to actually enable that. Wind, solar or nuclear are potential options that are out there," said Udd.

SaskPower spokesman Joel Cherry said nuclear power is being considered but has not been confirmed.

"SaskPower is considering nuclear power as a future supply option," Cherry said.

"We currently have no nuclear power in the province. And we won't make a decision on whether to build a small modular nuclear reactor until 2029."

Every energy technology possible, including small modular reactors, would be considered to power the mine to make it emissions-free and more cost-effective, said Simon Thomas, P.Eng., BHP's Saskatchewan-based vice-president of Projects Potash.

"We will look at whether or not other fuel sources can be used as a method of generating heat – that's something that is out there for us to look at and consider," said Thomas.

BHP will need a lot of energy for the mine that extends one kilometre underground to what is essentially an ancient seabed of three-to-five-metre-thick seams of the potash nutrient.

Electricity from fossil fuels will initially account for about 60 per cent of the mine's Co2 emissions and gas used for heating the rest. But nuclear energy, whether from SaskPower or through a third-party small modular reactor provider, could replace much of that by the mid-2030s.

BHO has already developed a plan to have more than 80 per cent of its underground equipment and vehicles go electric, further reducing its carbon footprint. It is also looking to switch from other fuels to further reduce emissions, including natural gas which is used to generate heat in the processing of the potash.

Saskatchewan-based alliance explores CCS potential for minerals and power production

Gasworld.com - The International Minerals Innovation Institute (IMII) and the Government of Saskatchewan are looking to develop potential carbon-capture and storage (CCS) hubs anchored by minerals and power production.

These hubs have the potential to support the production of low-carbon hydrogen from natural gas since that process generates carbon dioxide which could be captured and sequestered.

The partnership will assess geological carbon storage in the southern half of the province, transportation options and will look to design effective policies for hub development and investment.

Innovation Saskatchewan, SaskPower and IMII are providing funding for the study with Enbridge contributing in-kind resources. BHP and The Mosaic Company represent the potash industry and are contributing subject matter expertise.

The study is being undertaken by the Petroleum Technology Research Centre, Enbridge and the International CCS Knowledge Centre.

A public report will be published when the study concludes later this year and will be available on the IMII website.

PTRC paper on compressed air energy storage

SaskToday.ca - The Petroleum Technology Research Centre (PTRC) has formulated a white paper on the development of compressed air energy storage (CAES) in Saskatchewan.

It would be one possible solution to produce cost-competitive, low or emissions-free capacity electricity.

Using available and commercially-proven equipment and known Saskatchewan geology, CAES could be used to fully integrate intermittent renewable energy sources into Saskatchewan's power grid.

The PTRC said CAES technology has been proven at the industrial scale in Germany and the United States and the PTRC added Saskatchewan is particularly blessed with the ideal geology to develop CAES projects.

CAES involves powering a compressor to store large volumes of air at depth in purpose-built salt caverns to later be released through a turbine during periods of high-power demand.

Grain dryer efficiency tough to pin down

Western Producer - Farmers pour a lot of crop and energy through grain dryers, but it's hard to tell how well or poorly those dryers are doing.

"There's not a lot of good, reliable data for what is the baseline," said Charley Sprenger, an Engineer-in-Training with the Prairie Agricultural Machinery Institute (PAMI).

Grain drying has become a bigger issue for farmers in recent years due to wet harvests and the spread of corn growing in Western Canada, because of much higher fuel prices and because of worries that carbon taxes might be applied to grain drying.

However, grain dryers come in all shapes, sizes, fuel sources and configurations. That creates the possibility that farmers are operating drying systems inefficiently and wasting money.

PAMI is compiling and collating existing research on grain dryers to assess their efficiency. It is testing common dryer technologies and experimenting with ways of operating drying systems to be efficient.

"There's really no uniform or widely accepted dryer performance standard," said Sprenger.

PAMI is comparing different dryers to perfect conditions for removing moisture from corn to see how close they get. It is examining capital costs, timing of drying, harvesting implications, heat recovery, comparing propane to natural gas costs, different fan systems, adjustable controls and other choices engineers and farmers could consider.

Educating students on artificial intelligence

Moosejawtoday.com - With OpenAI's ChatGPT dominating headlines, there is a lot of confusion about what AI is, how it should be used or whether it poses a threat or an exciting new frontier and Shaun Nanan, P.Eng., a computer engineering professor at Sask Polytech Moose Jaw, is eager to clarify the subject in layman's terms.

Nanan is passionate about the intersection of education with technology. He recently founded the Nanan STEM Academy, which his own children attend and which offers students a dramatic leg up in learning about the past, present and future of technologies like coding, 3D printing, AI, robotics and logical thinking.

"There's certainly risks to any new technology," said Nanan. "ChatGPT is one of the most popular right now and if you've tried using it, you know it's pretty good at answering questions. It uses deep-learning algorithms to produce a response, but sometimes the information can be false or biased and currently there's no accountability.

Nanan said that artificial intelligence is a tool designed to increase human productivity. Tools can be used for negative and positive ends and it's the job of the user to educate themselves on the ethical, legal and cultural concerns raised by new technologies.

As an educator, Nanan is responsible for aligning program development with the future of work. His industry contacts, program advisory committees and personal research all agree: Future workers will need to be experts at critically filtering information from the internet, understanding cybersecurity and controlling their personal data and skills which also protect employers.

"We've been using AI for a long time. One of the earliest forms is the spell-checker, which was actually developed in the '70s," Nanan explained. "When it was first released, people were just absolutely amazed, but today we don't think twice about it, unless it isn't working properly."

"I believe AI tools needs to be embraced. ... AI cannot replace human creativity and imagination. You can ask ChatGPT to write lyrics to a rap song, but it's not Kendrick Lamar."

Mining industry leads way in adopting advanced tech

BNN Bloomberg and CBC - Mining companies are leading the way among Canadian businesses in adopting advanced technology such as artificial intelligence, according to a new report published by the Vancouver Economic Commission.

The report cited data collected by Statistics Canada in 2022 which found that 30.9 per cent of mining businesses adopted some advanced technologies - the highest

adoption rate of any industry.

Artificial intelligence (AI) was the main technology businesses chose to adopt, with about a third of businesses in natural resource extraction, like mining and oil and gas, applying the technology in some way.

"Almost one-third of surveyed businesses in mining, quarrying and oil and gas extraction used AI technologies," the report read.

"Commonly cited reasons were to develop new or improved processes or operations as well as for process flexibility and cost reduction."

AI technology has also helped companies make what have historically been dangerous jobs much safer, with automation sometimes eliminating the need for humans to be present at a mining site.

Nutrien, which has been working to develop tele-remote technology at its network of six potash mines in Saskatchewan, successfully mined an entire production wing at its underground Lanigan site last fall without a single human setting foot in the area.

Using radar, cameras, advanced sensing systems and cutting-edge technologies powered by AI, Nutrien operated its massive potash boring machines from a control room a few hundred metres away from the active mining face.

"It was just a huge success for us," said Shannon Rhynold, P.Eng., Nutrien's vice-president of potash engineering, technology and capital.

"Traditionally in potash mining, you've got these 250-tonne, massive pieces of equipment. There was always an operator sitting in the cab, running the joysticks, watching for various geological markers," she said. "One of the big challenges has been, 'how do you remove them from that machine?'"

The feat – the result of several years of intensive engineering work and experimentation – was a company first, with the goal of making potash mining safer by removing workers from the most hazardous underground locations.

Canada funds $74 million for new nuclear deployment in Saskatchewan

PowerEngineering.com - The Canadian government has approved up to $74 million in federal funding for small modular reactor (SMR) development in Saskatchewan, to be led by SaskPower.

This funding will support pre-engineering work and technical and regulatory studies, environmental assessments and community and Indigenous engagement.

SaskPower has selected the GE Hitachi BWRX-300 for potential deployment in Saskatchewan in the mid-2030s. The provincial power utility anticipates construction of its first SMR to begin as early as 2030, with a targeted in-service date of 2034. Additional facilities could begin construction as early as 2034.

As part of the utility's planning and regulatory work, SaskPower previously identified two areas to potentially site SMRs. The Estevan study area includes the areas around Boundary/Rafferty Dam and around the Grant Devine Dam. The Elbow study area includes an area around Lake Diefenbaker, from Gardiner Dam to the Diefenbaker Dam.

The Estevan site is close to the Boundary Dam power station, which is Saskatchewan's largest coal-fired power plant. The Gardiner Dam site plays host to around 186 MW of hydropower-generating capacity.

Cameco closes Westinghouse purchase

Pipelineonline.ca – Cameco now owns just under half of one of the world's top nuclear reactor-building companies, Westinghouse.

Cameco recently announced its acquisition of Westinghouse in a strategic partnership with Brookfield Asset Management.

For the expenditure of US$2.1 billion, Cameco now owns a 49 per cent interest. Brookfield owns the remaining 51 per cent in Westinghouse, one of the world's largest nuclear services businesses.

It comes at a time when Saskatchewan and SaskPower are heading down the path of nuclear power development in a big way.

When Pipeline Online asked Premier Scott Moe in August about expanded development of nuclear power, he mentioned that 1,000-megawatt reactors might be considered. Up until that point, SaskPower has been only talking about 300-megawatt small modular reactors.

Cameco offers the 1,000-megawatt AP1000 reactor and will soon offer a 300-megawatt small modular reactor, based on the design of the AP1000.

Saskatchewan looking at up to nine nuclear reactors

Pipelineonline.ca - Just how many nuclear reactors is SaskPower planning for?

SaskPower president and CEO Rupen Pandya told Estevan City Council the Crown corporation was looking at two small modular reactors near Estevan and four near Elbow.

That's an increase of two units compared to the original announcement made in the spring of 2022, when SaskPower initially said it intended to build small modular reactors in this province.

The number of reactors appears to be in flux. Don Morgan, who was Crown Investments Corporation and SaskPower Minister until a cabinet shuffle, said in a radio interview regarding building General Electric-Hitachi 300-megawatt small modular reactors (SMRs), "Depending on availability of money, we should be looking probably at four or six." But in the same interview, he added, "We should be probably planning for seven, eight or nine."

Northern Sask. uranium mine, mill closer to reality

CTV News - A major uranium project in northwestern Saskatchewan has cleared a significant regulatory hurdle.

NexGen Energy said its proposed uranium mine and mill to be built on the Athabasca Basin north of La Loche known as "Rook I" was granted full approval after an environmental assessment carried out by provincial officials.

Once complete, it will mine and process uranium ore from the Arrow Deposit. Discovered in 2014, the deposit begins 100 metres below the surface and extends as deep as 950 metres, according to NexGen.

According to the company, this is the first time in more than 20 years for any company to receive this kind of approval for a uranium project.

With provincial approval in place, the project is now awaiting completion of a federal review and assessment process from the regulator, the Canadian Nuclear Safety Commission.

NexGen says the mine's anticipated lifespan is estimated at 43 years, which includes four years of construction, 24 years of operation and a 15-year decommissioning and reclamation plan.

Scientists link geological features to untapped uranium deposits

Mining.com - Researchers at the University of Regina are studying how uranium deposits in Saskatchewan's Athabasca Basin formed more than 1.5 billion years ago to help figure out the best places to look for untapped resources.

"We're trying to understand the geological factors that control the formation of these deposits so that we know what features we should be looking for to find more uranium resources," Guoxiang Chi, P.Geo., a geologist working on the project, said in a media statement.

Chi, his PhD student, Morteza Rabiei, and colleagues used the Canadian Light Source at the University of Saskatchewan to analyze samples of quartz from areas known to contain uranium and nearby barren regions, the quartz having formed at the same time as the Athabascan uranium ore.

Understanding the conditions under which uranium ore is likely to form can help mining companies know where to look.

"We have to have a 3D understanding of the structures that control mineralization," the geologist pointed out.

"By taking all of this into consideration, we can improve our predictions and reduce the risk of unsuccessful mineral exploration."

Sask. faces shortage of 5,000 skilled mining workers by 2030, report says

CBC News - Saskatchewan needs to train or recruit thousands of new skilled workers in the mining industry if it wants to realize its economic potential, according to a new report from consulting firm Deloitte.

Deloitte says job vacancies for skilled mining positions have grown by more than 130 per cent in the past four years and if these jobs go unfilled companies cannot operate at full capacity.

Ron Hyggen, CEO of the Lac la Ronge Indian Band's Kitsaki Management, says they are training band members for mining industry jobs, but are also recruiting from across Canada.

He said companies, government and educational institutions need to do a better job at promoting the industry. They also need to be better at accommodating younger workers, who value flexibility and other factors.

He said Kitsaki is helping its own members get the education they need and has longstanding partnerships with companies in the uranium sector and others, but that more is needed.

"It's a major concern, for sure," he said.

Partnership signed for 5-MW geothermal project

Thinkgeoenergy.com and company news releases - DEEP Earth Energy Production and Ormat Technologies have

signed a Notice to Proceed Agreement for a partnership to launch the first 5-MW conventional geothermal power plant in Canada.

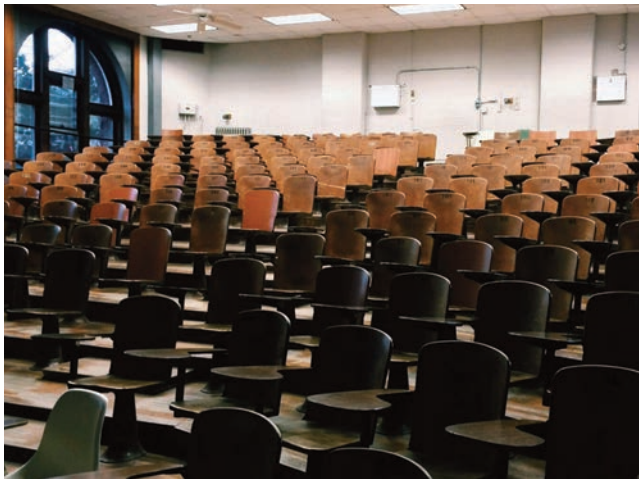
This development comes after years of collaboration between the two parties and is a notable first step to bringing the geothermal project online.

"We are grateful to have such a strong and committed partner as DEEP prepares to become Canada's first commercial conventional geothermal power producer. Together, we will revolutionize sedimentary geothermal power, incorporating DEEP'S first-in-the-world horizontal well design and Ormat's ORC power generation equipment. This is a transformative step forward in Canada's decarbonization strategy," commented DEEP Earth Energy's President & CEO, Kirsten Marcia, P.Geo.

The first phase of development of the geothermal power project in southeast Saskatchewan is for a 5-MW capacity power plant using an ORC unit and utilizing steam from two production wells complemented by two injection wells.

The power purchase agreement for the facility has already been signed with SaskPower.

More recently, third-party consultant GeothermEx confirmed that the geothermal resource in Saskatchewan can sustain thermal energy production for 40 years based on DEEP's development and operations plan.



Potential new Saskatchewan School of Mines

Mining.com and University of Regina - Colorado School of Mines recently entered a partnership with the University of Saskatchewan and is holding meetings with the provincial government about potentially establishing a Saskatchewan School of Mines.

In December 2022, The University of Regina and Colorado School of Mines signed a memorandum of understanding agreeing to collaborate on research, business and academic opportunities to build on their shared commitment to energy and environmental resource sustainability.

Students display experiential learning at Project Day

University of Regina - University of Regina students in their fourth year with the Faculty of Engineering and Applied Science showcased their ingenuity at the Faculty's annual Capstone Project Day.

"Capstone Project Day is an event that allows our students to demonstrate how they've applied hands-on learning to real-world problems and challenges," said Dr. Phillip Choi, P.Eng., Dean of the Faculty of Engineering and Applied Science.

Industrial Systems Engineering
Among the industrial systems engineering students at Project Day were Andrew Rowe, Chance Smith, Dawson Halstead and Erik DeRosier and their project, Static Intermixer for Blended Co-Extrusion Based 3D-Printing.

Electronic Systems Engineering
For their project, *Full Body Human-Machine Interface for Balance Rehabilitation*, electronic systems engineering students Isaac Labrie-Boulay, Harith Abdulkareem and Benjamin Pullar teamed up with researchers from the Faculty of Kinesiology and Health Studies to develop a human-machine interface system for virtual reality games used for balance rehabilitation.

Software Systems Engineering
Having moms who developed foot problems served as motivation for software systems engineering students Xiao Chu Zhao (Jack) and Ahras Ali, who created a mobile app that helps people manage foot health.

Creating the model for the app using artificial intelligence was a daunting task and one they had to learn from scratch.

"AI scared me, but when we took this project on and started diving deeper into it, it was OK," Ali said. "Instead of a test, this is an actual application that we can show companies and employers what we've been able to accomplish and show that we have the skills that they are trying to apply in their industry."

USask engineering student leader wins 3M fellowship

University of Saskatchewan - Shanleigh McKeown, described as a tour de force in the world of engineering student leadership, has won a 3M National Student Fellowship.

McKeown, who grew up in Saskatoon and Humboldt, will graduate in June with a degree in environmental engineering from the University of Saskatchewan College of Engineering.

While pursuing her engineering degree, McKeown's leadership positions in student government have been:

- President, Saskatoon Engineering Students' Society;
- President, Western Engineering Student Societies Team (WESST) for two consecutive academic years;
- Western Canadian Ambassador, Canadian Federation of Engineering Students (CFES);
- President, CFES, representing 85,000 engineering students across Canada.

McKeown has also received scholarships recognizing not only her achievement but her resilience:

- Engineers Canada Student Leadership Scholarship, focusing on leadership, resiliency and vision for the engineering profession and community;
- Elizabeth La Award for Women in Engineering, highlighting community involvement, contributions to leadership and community and barriers to education that the recipient has overcome.

McKeown's win is the third consecutive year that a USask student has been chosen for a fellowship and second time an engineering student has been selected. Samia Sami, Engineer-in-Training, (BE '21 Electrical) was selected in 2021.

Photo Credit: University of Saskatchewan

USask Engineering graduate earns Governor General's Silver Medal Award

University of Saskatchewan - Growing up, Alex Mayhew's favourite question was, "Why?"

"I think my parents have told me that me asking 'why?' as a kid sometimes got a little much because no matter what they said, that was the follow-up question," said Mayhew, whose innate curiosity about how things worked, paired with his love of science and math, ultimately led him to the College of Engineering at the University of Saskatchewan.

He graduates at the top of his class with an average of 95.85 per cent, earning the APEGS Gold Medal and one of the two Governor General's Silver Medals.

He joined the University of Saskatchewan Space Team (USST) during his second year in USask Engineering, getting involved with the RADSAT-SK cube satellite project and helping with development of the USST's new rocket project.

RADSAT-SK faculty supervisor Sean Maw, P.Eng., speaks highly of Mayhew both as a student and team member.

"Alex has been a model engineering student throughout his undergraduate career, exhibiting exemplary conscientiousness, hard work, maturity and insight," Maw said.

Road safety project learns from Saskatchewan's safest intersections

University of Saskatchewan - A College of Engineering master's student, Shaheli Senanayake, is on a mission to make Saskatchewan roads safer for pedestrians and drivers.

Her project takes a unique approach to road safety research. It offers an original perspective that focuses on what Saskatchewan's best-performing intersections are doing right to help improve safety.

"Traditionally, efforts to improve road safety have concentrated on places with a history of many accidents," Senanayake said. "However, this research takes a different approach. It focuses on intersections that are doing well in terms of safety."

About 200 intersections in Saskatoon and Regina will be studied by Senanayake over a three-year period.

The expertise of her research supervisor, Dr. Emanuele Sacchi, P.Eng., an associate professor in the Department of Civil, Geological and Environmental Engineering at USask, along with intersection data collected from satellite images and local traffic accident data, will help Senanayake analyze which geometric elements of intersections appear to make them a low-collision site.

Senanayake plans to present her results in 2024.

Genome Canada supports innovative USask agricultural research

University of Saskatchewan - A research project led by the University of Saskatchewan's Dr. Patrick LloydSmith (PhD) and Dr. Sean Prager (PhD) has received funding to enhance climate-forward research projects in the field of sustainable and resilient agriculture.

Both are with the College of Agriculture and Bioresources. Prager's work focused on the habitation of beneficial insects in pasture-use grasslands and Lloyd Smith is helping develop economic models to measure the impacts

and perceived value of bringing in native plant species.

Dr. SeokBum Ko, P.Eng., with the College of Engineering, is also involved developing artificial intelligence models to better predict carbon storage in soil using the data gathered during the course of the project.

Drones tracking down water stress relationship

Western Producer – Researchers are using drones to study the correlation between the thermal temperature of a plant and water stress, which typically means a shortness of water.

"I'm using an unmanned aerial vehicle to collect the thermal electromagnetic radiation that comes off of crops and using that to correlate it to crop volumetric water content in the soil to try and create a relationship," said Emily Cline, a master's student in civil engineering at the University of Saskatchewan.

The two-year project wraps up this fall once the crop is off. They have been flying the drone over different crop plots and quarters of land once a week to get thermal images, with pixels every metre.

Evan Derdall, P.Eng., a research engineer at Agriculture Canada who is Cline's project supervisor, says drones are the best way to exercise thermal technology.

"To get a full infrared, that's basically our only option right now," said Derdall. "There's satellite thermal infrared sensors, but the resolution, you're looking at a few pixels per quarter section."

The hope is once the temperature-water relationship is determined, farmers or contracted companies will be able to monitor the temperatures using drones and eventually use satellites when the technology becomes more advanced.

In a similar drone project, Phillip Harder and Warren Helgason, P.Eng., are using drones equipped with light detection and ranging (lidar) technology.

The lidar uses lasers that hit target points of the canopy and ground to measure the height and density of the crop canopy. Many lasers reflect off the top of the canopy, but any gaps will have the lasers hit the ground, giving them an image of the vegetation.

Helgason, an associate professor at the university's department of civil geological environmental engineering, is Cline's academic supervisor. Harder is a research associate at the Centre for Hydrology.

"We're hoping to demonstrate that this is a more robust and reliable way to quantify crop variability versus multi-spectral approaches," said Harder.

Harder said measuring the special variability of the crop can give farmers a stronger sense of what is going on in the field.

Saskatchewan's Economic Assessment Tribunal includes engineer

CJME/CKOM/Canadian Press - Ken From, P.Eng., FEC, FGC (Hon.), has been named to the Economic Assessment Tribunal created by the Saskatchewan government under the Saskatchewan First Act.

From is a former CEO of SaskEnergy and the Petroleum Technology Research Centre.

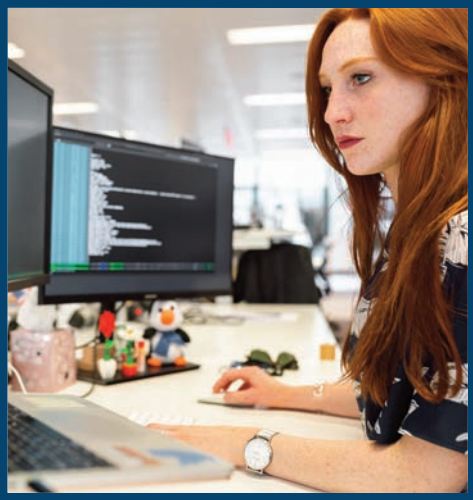
The tribunal will focus on three main areas: The Clean Electricity Regulations; federal fuel standards; and the oil and gas caps. It will examine federal laws and programs and put a dollar value on what the government calls potential harms to the province.

It will start by reviewing the federal government's proposed Clean Electricity Regulations. The first report on the Clean Electricity Regulations is expected to come out in May.

The tribunal will be chaired by Michael Milani, a senior partner at law firm McDougall Gauley LLP in Regina. Dr. Janice MacKinnon, a former NDP finance minister of Saskatchewan, will be vice-chair. Others making it up are Dr. Stuart Smyth, a professor of agricultural and resource economics at the University of Saskatchewan; and Estella Peterson, an oilsands heavy equipment operator from the Cowessess First Nation who serves as part of Suncor Energy's Aboriginal Ambassador program.

Tribunal members are appointed for a three-year term and will operate under the Ministry of Justice.

News Beyond Our Borders



Experts weigh in on Professional Engineers Ontario's removal of Canadian experience requirement for licensing

Newcanadianmedia.ca - Professional Engineers Ontario's Canadian experience requirement for accreditation may be transitioned to a competency-based assessment.

As Professional Engineers Ontario works toward removing the Canadian experience component of the accreditation process for internationally trained professionals, some, including on social media, are wondering how these professionals will adapt to a Canadian environment.

If you come from a warm country, for instance, do you know how to deal with snow loads on buildings? As a civil engineer, have you ever dealt with the contraction of steel in very cold temperatures?

Roydon Fraser, president of Professional Engineers Ontario [PEO], says that while these are legitimate concerns, the Competency-Based Assessment [CBA] used in British Columbia for many years, is another way to assess experience and assuage the public's concerns.

The adoption of the CBA framework has changed the landscape on how experience is assessed, says Mark Fewer, CEO and registrar of Professional Engineers and Geoscientists Newfoundland & Labrador (PEGNL).

Fewer said the CBA's focus is not solely on the amount and type of experience acquired, or where it was acquired, but rather on "demonstrated competencies, which has helped eliminate some of the challenges including removing the one-year Canadian experience previously faced by applicants."

It's also why both domestic and international applicants must be able to demonstrate their competencies under this framework, he added.

In September 2022, PEGNL, which receives 40 per cent of international applicants annually, fully implemented a CBA framework for evaluating experience.

Fewer said the framework focuses on "outputs – a demonstration of one's understanding and abilities – vs. inputs – what and how much of something one has."

As a result of adopting this framework, Fewer said PEGNL has eliminated the 12-month Canadian experience requirement.

Additionally, while some of the competencies under the CBA are identified as Canadian environment competencies, which best demonstrate an applicant's knowledge and or experience of Canadian regulations, codes and standards, Fewer said the experience examples provided to demonstrate competency in these areas do not necessarily have to be acquired within Canada.

Not all see it that way. While some professionals saw PEO's recent removal of the Canadian experience requirement as a positive step towards inclusion and diversity within the profession, Stephanie Holko, president and chair of the board of the Ontario Society of Professional Engineers (OSPE), said there are people who feel Canadian experience is essential to understanding codes and regulations.

B.C. introduces International Credentials Recognition Act

Global News - British Columbia has introduced legislation that would make it easier for internationally trained professionals to work in the province.

Bill 38 – the *International Credentials Recognition Act* – will help regulatory bodies improve the credential recognition process for these professionals.

Manitoba and Ontario have also all previously announced programs to ease the credentialling process for internationally trained professionals.

Job seekers from outside Canada have shown far greater interest in coming to work in the country, according to a previous Indeed report.

Overall, in the third quarter of 2023, 14 per cent of clicks on Canadian job postings on Indeed were made by job seekers from abroad, more than double their six per cent share in mid-2019. It will affect 29 different professions including engineering and architecture.

The provincial government expects the full implementation of Bill 38 by the summer of next year.

Photo Credit: Royal Canadian Mint

Royal Canadian Mint issues commemorative coin honouring engineer

CNW - The Royal Canadian Mint is issuing a new $1 commemorative circulation coin honouring Elsie MacGill, an exceptional Canadian who broke barriers as an engineer and leading advocate of women's rights.

Her lifelong advocacy for women's rights included her appointment to the Royal Commission on the Status of Women, in 1967.

Manitoba opens first potash mine

CJNB - The first potash mine in Manitoba has officially opened.

It's located in Harrowby, near the Manitoba-Saskatchewan border and will produce around 250,000 tonnes of the mineral, which is primarily used in fertilizer, per year.

The Potash and Agri Development Corporation of Manitoba has already invested over $12 million in the project. They've also committed to sharing 11 per cent of net profits with local First Nations, the Manitoba Métis Federation and other local governments.

The Gambler First Nation is also a 20 per cent equity partner.

Meanwhile, this is expected to be the most environmentally-responsible potash mine in the world.

The Manitoba Government explained the facility will be a carbon-neutral facility which will help it leave behind a smaller environmental footprint than traditional methods.

Helium Developer Association of Canada established

Gasworld.com - Canadian helium companies have come together to establish the Helium Developer Association of Canada (HeDAC) to address growing demand for a long-term, secure helium supply chain.

Representing those looking to explore, develop and produce helium in Western Canada, the association has a mandate to create public awareness and align industry and governments in advancing helium supply.

Helium plays a key role in many medical applications, including magnetic resonance imaging. It is also pivotal for semi-conductor and fibre optic manufacturing, small modular reactors, quantum computing, industrial welding and manufacturing, space applications and more.

Canada's helium resources are estimated to be the fifth-largest in the world but account for less than two per cent of global helium production. Most of the world's helium is produced in the U.S. and unstable political environments such as Russia, Qatar and Algeria.

Much of Canada's helium resources are in southeastern Alberta and southwestern Saskatchewan.

Retirements from mining create risks

Mining.com - While mining is crucial to any nation's national security and to the production of energy infrastructure and electric vehicles, actual production of the critical minerals needed globally is not keeping pace.

It's estimated the world will need to produce over the next 20-25 years the amount of copper that has been produced throughout all human history, said Walter Copan, Vice-President, Research and Technology Transfer at Colorado School of Mines.

'Grey tsunami'

Meanwhile, the mining industry is facing a critical-skills gap, compounded with the so-called "grey tsunami" with regard to the amount of retirements anticipated.

Copan noted academia has seen a decline in programs that relate to mining, engineering and extractive metallurgy.

"This industry has lost its lustre, with regard to being attractive to the next generation of leaders at all levels in the sector and the lack of interest in the geosciences more broadly," Copan said.

"Mining, mineral processing and then the downstream production of the materials that we rely upon for all aspects of the energy sector [are] at risk because of these shortages and I find the statistic staggering that we are anticipating a retirement of more than half of the U.S. mining workforce over the next six years, that's 221,000 workers that are expected to retire by 2029," Copan said.

The pipeline of people servicing the sector from the leadership level to engineering and extractive metallurgy are being replaced only at a trickle in the United States, Canada, Australia and in Europe.

Australia, Canada and U.S. merge geo data

Miningnewsnorth - The U.S. Geological Survey has released a compilation of national-scale geological, geophysical and mineral resource datasets from Australia, Canada and the United States.

Part of a larger collaboration to better understand the critical minerals potential across Australia, Canada and the United States, the federal geological surveys from the three countries have merged national-scale geological, geophysical and mineral resource information into a single dataset that is expected to enhance critical mineral discovery.

"Geology doesn't stop at the border and neither does our data," said U.S Geological Survey scientist Anne McCafferty, who led the data compilation effort.

"Scientists will now be able to look at geological and geophysical data seamlessly across both Canada and the United States, as well as make direct comparisons to Australia."

The tri-national geologic, geophysics and mineral resource data release includes more than 40 earth science data layers, including a new map of variations in the Earth's natural magnetic field for the entirety of Canada and the U.S that geoscientists can use to develop three-dimensional representations of geology underground.

Critical Minerals Mapping Initiative

The tri-national geo-data release is part of the Critical Minerals Mapping Initiative, a partnership forged in 2019 to support the establishment of a diversified supply of critical minerals in Australia, Canada and the U.S.

"This joint data release speaks to our continued commitment to improve scientific co-operation and data sharing between the U.S. Geological Survey, Geoscience Australia and the Geological Survey of Canada," said Geological Survey of Canada scientist Christopher Lawley.

America's heavy dependence on countries like China for critical minerals and an overall lack of knowledge about many of these elements needed for clean energy, high-tech devices and military hardware was a primary driver behind the formation of CMMI.

In addition to data-sharing, CMMI combines the expertise brought to the table by each of the nation's geological teams.

"Because each country has expertise in different fields, bringing all of these experts together can create a strong foundation of mineral information that can be used by policymakers, resource managers, industry and others to help meet the needs of all three countries' economies and security," USGS penned in a 2020 announcement of the critical minerals collaboration.

This geological partnership will also help Australia, Canada and the U.S. co-ordinate supply chains for the minerals critical to the clean-energy goals and manufacturing sectors in all three countries.

Geological Survey of Canada

A team led by the Geological Survey of Canada used the tri-national geophysics datasets created under CMMI and machine-learning techniques to map Mississippi Valley-style zinc deposits in Australia and North America.

One way the combined geological information has already been leveraged is as a much larger and more diverse dataset for artificial intelligence and machine learning mineral exploration techniques.

A CMMI team led by the Geological Survey of Canada has already used the data layers to map the potential for certain types of zinc deposits in all three nations.

The sediment-hosted zinc deposits this investigation focused on often host gallium and germanium, a pair of technology metals important to chipmaking that have gained attention due to China's dominance in their supply and restrictions on exports.

The international team of geoscientists is using similar techniques to model the potential for other critical mineral systems across Australia, Canada and the U.S.

Sweden to lift ban on uranium mining

Mining.com - Sweden's Climate Minister, Romina Pourmokhtari, has unveiled plans to lift the nation's ban on uranium mining, thereby paving the way for an expanded nuclear energy capacity.

Pourmokhtari told The Times that a majority within the Swedish Parliament supports the ban's removal.

The government has outlined the construction of a minimum of 10 large reactors within the next two decades.

Sweden's nuclear power reactors provide about 40 per cent of its electricity.

In 1980, the government decided to phase out nuclear power. In June 2010, Parliament voted to repeal this policy.

Sweden accounts for 80 per cent of the European Union's uranium deposits and currently engages in uranium extraction as a byproduct during the mining of other metals.

Canadian site nominated to mark Anthropocene

The Canadian Press - A team of geologists has concluded, after studying sites around the globe, that a tiny, deep lake in southern Ontario should mark the birth of the modern world.

A few layers of sediment from around 1950 at the bottom of Crawford Lake, they say, show more clearly than anywhere else how human activities have changed the planet's functioning to the extent that a new geological epoch should be declared: the Anthropocene, or the age of people.

"It's a bit sobering," said Francine McCarthy, a Brock University geologist who was on the research team for the Anthropocene Working Group of the International Union of Geological Sciences.

"Within that short span of time, the system flipped and can't go back to the way it used to be."

Her group says the lake along the Niagara Escarpment should be considered the location for the so-called "Golden Spike" marking the start of the Anthropocene. The recommendation was announced at the International Congress on Stratigraphy in Lille, France.

Geologists are to debate the issue, including whether the Anthropocene should be declared at all. The matter is to come to a final vote at the International Union of Geological Sciences in August 2024.

That will bring to a close a debate geologists have been having since 2009: have humans altered the planet's functioning profoundly enough to change its geology and if so, should a new geological epoch be declared?

Some geologists initially suggested a new epoch should begin with the Industrial Revolution, when fossil-fuel combustion began in earnest.

But many currently prefer the year 1950.

That's when plutonium-239 begins to show up in geological strata. The element does not occur in nature and is the result of widespread nuclear weapons testing.

The year also coincides with the beginning of the so-called "Great Acceleration," a time when everything seemed to suddenly take off.

A 2015 paper in the journal Anthropocene Review produced 12 graphs on everything from population to GDP to fertilizer use to dam construction to energy consumption to international travel. They all spike dramatically right around 1950.

Many of these accelerations show up in the geological record.

The scientists chose Crawford Lake because of the remarkable clarity and depth of its sedimentary record. Because of its significant depth -- 24 metres -- and narrow surface of a few hectares, Crawford's deeps never mix and are essentially cut off from the world.

Answering Call to Action 92 through design

The Georgia Straight - Canada is in a housing crisis. It is a challenge relevant to many Canadians across the country but is of particular significance to Indigenous Nations.

For those who will be at the forefront of supporting First Nations in achieving their self-determined community plans, one small part of the effort to address this challenge is to implement number 92 of the Truth and Reconciliation Commission's 94 Calls To Action.

For the engineers who may be involved in designing and building these communities, this can be achieved by taking a holistic, human-focused and collaborative approach to design. An empathy-driven approach.

What is empathy-based engineering?

Empathy-based engineering focuses on the user's needs and takes a more people-centred approach to engineering design. It strives to understand and empathize with the preferences, experiences and expectations of the user,

ultimately building a product that meets the needs of today by taking into consideration the experiences of the past – while leaving a better world for future generations.

Addressing the on-reserve housing crisis should look like cultural collaboration, fostering an environment primed for thoughtful design by consulting and working shoulder-to-shoulder with First Nations groups to understand what is important to them.

Empathy in housing design can also naturally drive solutions that are more sustainable long term. In this way, empathy is also an ethical responsibility – and one that is often forgotten in favour of developing homes quickly.

Mechanical engineers among most-in demand careers

CICnews.com - According to Randstad, an employment agency and consulting firm with over 60 years of industry experience, the three most in-demand jobs across Canada are developers, human resource managers and mechanical engineers.

To build your financial future

The Engineers Canada-sponsored Financial Security Program offers a range of plans with Canada Life to help you grow your savings, then turn your savings into income for your retirement years.

Personalized guidance to help you reach new heights

As an engineer or geoscientist, you know that nothing should be built without a solid foundation. That's where your personal health and wealth consultant comes in. They're licensed professionals who can:

- ☑ Meet with you online – when it's convenient for you
- ☑ Help guide you through all stages of your financial journey
- ☑ Talk to you in more than 10 languages

Take it from those who have met with a health and wealth consultant:

97%
said they felt valued

98%
felt they were spoken to in a way that was easy to understand

99%
said all their questions were answered on their personal needs.

Plus, being part of a group plan means you get to enjoy lower-than-retail fees* – which means more money for you!

Learn more today!
canlife.co/engineerscanada

engineerscanada
ingénieurscanada

A plan **built** just for you.
For life as you know it

*Lower investment management fees, when compared to typical individual investment and retirement savings plans.

Calendar of Events

Below are some featured events. Please see the Events calendar online for a full list of events: **https://events.apegs.ca/**

Saskatoon Geotechnical Group – Mitigating Landslide on Hwy. 40 (A Toolbox of Solutions)
Saskatoon, SK
January 17, 2024
https://www.saskatoongeotech.com/events/mitigating-landslide-on-hwy-40-a-toolbox-of-solutions

LEED Green Associate Training
Live webinars (or on demand)
January 13, 2024
February 10, 2024
https://leadinggreen.com/online-leed-green-associate/

ACEC-SK Future Leaders Conference
Saskatoon, SK
February 28-29, 2024
https://www.acec-sk.ca/events/acecsks_2024_future_leaders_conference.html

PDAC: The World's Premier Mineral Exploration & Mining Convention
Toronto, ON
March 3-6, 2024
https://www.pdac.ca/convention

SAVE THE DATE - APEGS Spring PD Days
Regina, SK
March 4-5, 2024

APEGS Awards Banquet
Regina, SK
March 7, 2024
https://www.apegs.ca/event/awards-banquet

Saskatoon Geotechnical Group – Tailings Dam Breach Assessment Methodology
Saskatoon, SK
March 20, 2024
https://www.saskatoongeotech.com/events/tailings-dam-breach-assessment-methodology

University of Regina – Inspiring Leadership Forum: Go Far, Together
Regina, SK or livestream
March 27, 2024
https://www.uregina.ca/inspiringleadership/index.html

SAVE THE DATE: APEGS Annual Meeting and Professional Development Conference
Saskatoon, SK
May 3 & 4, 2024

SUMA Convention and Tradeshow – Refresh, Renew, Refocus
Regina, SK
April 14-17, 2024
https://suma.org/events/conventions-and-tradeshows

Find Us on Social Media:

X: @APEGS_SK

Facebook: @APEGS.sk

LinkedIn: Association of Professional Engineers & Geoscientists of Saskatchewan (APEGS)

PUBLICATION MAIL REGISTRATION NUMBER: 40034203