PEG

WINTER 2015

Planning and Preparation

The Association of Professional Engineers and Geoscientists of Alberta | apega.ca APEGA

WE SPECIALIZE IN SIMPLE, COST-EFFECTIVE AND RELIABLE FACILITY DESIGNS.

Gold-plated designs are out of place under any market conditions. That's why we focus on cost-effective engineering that simplifies facility operations and maintenance. We streamline equipment and design specifications to remove costly overdesign and minimize complexity.

Put our experience to work for your project.
Learn more at **vistaprojects.com**

Vista Projects
Engineering oil & gas facilities

Contents

WINTER 2015

FEATURED PHOTO:
PAGE 70 ››

FEATURES

DEPARTMENTS

PRINTED IN CANADA

MIX
Paper from responsible sources
FSC® C011825

PEG

VOLUME **6** | NUMBER **4** | **WINTER** 2015

(Print) ISSN **1923-0044**

(Online) ISSN **1923-0052**

Editor **George Lee** ✉ glee@apega.ca

Administrative Assistant **Catherine Hiemstra** ✉ chiemstra@apega.ca

US POSTMASTER: PEG (ISSN 1923-0044) is published quarterly in Spring, Summer, Fall and Winter, by the Association of Professional Engineers and Geoscientists of Alberta, c/o US Agent-Transborder Mail 4708 Caldwell Rd E, Edgewood, WA 98372-9221. $15 of the annual membership dues applies to the yearly subscription of The PEG. Periodicals postage paid at Puyallup, WA, and at additional mailing offices. US POSTMASTER, send address changes to PEG c/o Transborder Mail, PO Box 6016, Federal Way, WA 98063-6016, USA.

The publisher has signed an affiliation agreement with the Canadian Copyright Licensing Agency.

Please return Canadian undeliverables to: APEGA, 1500 Scotia One, 10060 Jasper Ave., Edmonton, AB T5J 4A2. Publications Mail Sales Product Agreement No. 40062712

APEGA CONTACT INFO

HEAD OFFICE

1500 Scotia One
10060 Jasper Avenue NW
Edmonton AB T5J 4A2
PH 780-426-3990
TOLL FREE 1-800-661-7020
FAX 780-426-1877

www.apega.ca

email@apega.ca

CALGARY OFFICE

2200 Scotia Centre
700 Second Street SW
Calgary AB T2P 2W1
PH 403-262-7714
TOLL FREE 1-888-262-3688
FAX 403-269-2787

BRANCH CHAIRS

Calgary **Adekunle (Ade) Okusanya,** *P.Eng., MBA* calgarybranch@apega.ca
Central Alberta **Sonny Nagra**, *P.Eng.* centralalbertabranch@apega.ca
Edmonton **Sadiq A. Pirani**, *P.Eng.* edmontonbranch@apega.ca
Fort McMurray **Unokhaso (Uno) Monofi**, *P.Eng.* fortmcmurraybranch@apega.ca
Lakeland **Natasha Pounder**, *P.Eng.* lakelandbranch@apega.ca
Lethbridge **Adam St. Amant**, *P.Eng.* lethbridgebranch@apega.ca
Medicine Hat **Said Said Yussuf**, *P.Eng.* medicinehatbranch@apega.ca
Peace Region **Brian Morrison**, *P.Eng.* peaceregionbranch@apega.ca
Vermilion River **Dustin Wiltermuth**, *P.Eng.* vermilionriverbranch@apega.ca
Yellowhead **Vacant**

It's almost time for APEGA's

Friday, February 19, to Sunday, March 20, 2016

Have you reset your password yet?

On September 28, 2015, APEGA reopened the Member Self-Service Centre (MSSC) at apega.ca. If you've attempted to login since then, you know that you were required to reset your password to gain access to your account.

If you haven't been to the MSSC since then, please go there now — particularly if you plan to vote during the election. APEGA's electronic voting system is run through the MSSC.

Visit apega.ca to get to the MSSC.

Need Password Reset Help?

Call 1-800-661-7020 and press 2 when prompted.

APEGA

Planning and Preparing for What Can't be Known

BY **CONNIE PARENTEAU,** *P.ENG., FEC, FGC (HON.)*
APEGA President

In Canada, we enjoy a high standard of living. Public services like fire and police protection, healthcare, and much more are readily available. We sometimes complain about them, but at the end of the day the issues we have can often be chalked up as so-called first-world problems.

Perhaps because we have so much, we sometimes surrender our personal responsibilities to others. We're along for the bus ride. My challenge to all Members, however, is to stop being simply a passenger. Step up and step out to make a difference — even when what may happen is unknown.

One opportunity to do so is by taking part in APEGA's legislative review. We are the regulators of engineering and geoscience in Alberta, and these days we're peering into that proverbial but perpetually cloudy crystal ball. I'm sure you're doing the same in your professional and personal lives, particularly in light of the recession Canada is experiencing and the downturn that persists in the oil and gas industry. We must continuously look ahead, and we must do so in multiple roles: as individuals, as Professional Members of APEGA, as regulators, and as members of the public.

When you think about it, Planning and Preparation — capitalized because they're the theme for this PEG — are not about knowing *what* will happen. They're about knowing *something* will happen. Sure, we look at the trends and make our best assumptions. But really what we're doing is planning and preparing for the worst, while keeping ourselves in a position to succeed no matter what. We need to poise ourselves to act on opportunities as they arise. We need to have the right tools at hand, and we need to know how to use them.

Many of APEGA's tools are within the *Engineering and Geoscience Professions Act (EGP Act)*, which is owned by the people of Alberta through the Government of Alberta. APEGA will recommend legislation to the government that needs to have relevance for decades down the road to ensure that the professions of engineering and geoscience are regulated appropriately to protect the public. We don't pretend to know the specifics of the Alberta of 2045, but we are certain that an Act that was created in the 1980s is not what we need.

How do we know this? Frankly, the Act is showing its age. Expectations placed on regulators — and of all bodies that serve or interact with the public, from governments to corporations to everything in between, are greater than they've ever been. We need an Act that understands and communicates the social partnership APEGA is building with Albertans. An Act that is more reflective of our times. An Act that allows, with clarity, APEGA to be quick and nimble. An Act that's flexible enough for a future we can't predict with certainty.

Many of you have been involved in our legislative review process so far. Right now, the fall consultations have just wrapped up. More information about what we heard this fall from you and other stakeholders is either posted or will be soon on the legislative review website, which you can reach through apega.ca. As well, a story on where we are now and where we're going with the review appears in this edition of *The PEG*.

If you haven't taken part in the process yet, there's still time. A third round of consultations on the Act itself starts in late February and ends in March. Soon after, we'll begin work on the General Regulations, and soon after that the Bylaws. Member and stakeholder input continues through those two phases.

In April of 2016, Members will be presented with a report of the proposed recommendations Council has endorsed to present to the government to use as guiding principles in negotiations for changes to the Act. I need to emphasize here that you will not be voting on these principles or approving the Act itself. That's because the Act does not belong to APEGA or Members. It's our job as an Association to gather input from you and other stakeholders, which we're doing. It's the government's job to accept, reject, or revise what we present.

We've looked at the legislation guiding other regulators. We've listened to Permit Holders, individual Members, and the public. We've counted on the work of our champions collaborative to get the word out at the Branch level and hear what the grassroots of the organization has to say.

As I said, another round of consultations is about to start. So please watch your inbox for the e-PEG to find out more, and do your part in developing the APEGA of the future. A future in which every Professional Member of APEGA will ultimately be living out the decisions that make up our new legislation.

MORE ABOUT PLANNING AND PREPARATION

When I learned that the theme for this edition of *The PEG* is Planning and

President's Notebook

Preparation, I thought of the challenges those two words present. It's interesting to me to look at what we're doing on the legislative review front — and really on many other fronts in the organization — while hearing various speakers at various events confirm that our approaches are sound. No, the speakers aren't offering a clear picture of what Alberta will be like 30 years from now (and to be fair, none of them purported to be doing so). But many of them, as it turns out, have a lot to say about planning and preparation.

Two specific things come to mind, both of which I alluded to earlier in this column. One is the need to plan for the worst. The other is the role of individual responsibility — the self in self-regulation.

Optimism is important in life. So why prepare for the worst? Why come up with a plan for the most egregious and dramatic events imaginable? Doesn't that mean you're just dwelling on the negative?

Yes. Please, dwell on the negative. But dwell on it in a positive way. Develop a plan that will get you through the worst of events. It just makes sense for Alberta families, for example, to prepare for tornadoes. Chances are they'll never have to deal with one. But having a plan in place makes windstorms all the more survivable.

There's a certain confidence that comes from a well-rehearsed and clearly written plan. It allows you to do a thing that successful humans are good at: compartmentalize. Once your plan is in place, you can confidently and optimistically get on with the other things your life demands.

In times of crisis, there is only so much that the institutions you've come to rely upon can do for you. This is the individual responsibility part. As Members of a self-regulating organization, we need to always remember our own roles. So let me take this opportunity, once again, to encourage you to take part in the consultation process in the legislative review.

Here's another thought. As you plan your own professional future, please take a close look at what you are doing to fulfill APEGA's mandatory Continuing Professional Development requirements. You have a professional obligation in this area, of course, but there's practical purpose, too. It's to your advantage to personalize your program and make it relevant to your career and your practice, now and in the future.

Is your program, for example, relevant in an economic climate that features oil selling at under $40 a barrel? And is your program relevant in a world of high public expectations placed upon professionals, regulators, governments, and other organizations?

APEGA offers professional development options to help you plan and prepare. Read about the details elsewhere in this *PEG*.

EVERYDAY LEADERSHIP

Members still bring up my column from the summer 2015 *PEG*, titled Everyday Leadership — Pass it On. It's really rewarding to write about something that means so much to me personally and find out that it resonates widely.

So I'll end by thanking our champions collaborative for being everyday leaders in legislative renewal. The skills and knowledge you are developing and practising are building a better APEGA. You've engaged your fellow Members in a process critical to the future, and you've passed leadership on to others.

And since this is the last *PEG* of 2015, let me wish the best of the new year to Members and readers.

Questions or comments?
president@apega.ca

Planning to Become a Better Regulator? There's a Cost

BY **MARK FLINT,** *P.ENG.*
APEGA Chief Executive Officer

Prediction is very difficult, especially if it's about the future.

-**NIELS BOHR,** *Physicist*

Regardless of whether you believe it was Niels Bohr or Yogi Berra that coined the above ironic insight into the unknown, when the topic of planning comes up it usually elicits one of two divergent reactions. Some people will experience a pre-dormant eye-glazing, followed by a period of deep unconsciousness. For others, endorphin production spikes and an ensuing, unregulated level of hubris drives them to produce highly complex and colourful plans that will transform the universe.

Regardless of where you sit on the spectrum, the unfortunate truth is this: "If you don't know where you are going, you might wind up someplace else." OK, that one was Yogi Berra. Apparently.

This issue of *The PEG* is devoted to planning and the future. As we close out the third year of our current strategic plan and enter into its last year, we do so knowing that 2016 is a year of transition for APEGA. We have dedicated the past three years to building capacity aimed at improving many of APEGA's current systems and functions.

The year 2016 arrives during a dramatic economic shift, which has resulted in some significant economic impacts here in Alberta. As we transition from our current strategic plan and prepare to launch APEGA's new strategy in 2017, how will APEGA position itself to achieve the aim of being a more capable regulator? Let me explain the three main thrusts, plus a unique opportunity that needs careful attention.

The first line of effort is aimed at continuing to improve operational excellence. APEGA has done much over the past few years to improve business practices, but we have lots left to do. Second, we are going to revamp APEGA's Continuing Professional Development program to improve its effectiveness, and we will include an ethics component stemming from our own learnings and from events in other jurisdictions. The third element is to improve the Professional Practice Management Program so we can deliver better value to our Permit Holders by enhancing their role in self-regulation.

Last, but no less important, is that unique opportunity I mentioned. It's the commemoration of the 100th year of our professions in Alberta, which arrives in 2020.

APEGA's Council and senior leadership team have been engaged in developing strategy over the past year. We have a clear understanding of what we want to achieve. But as I have already alluded to, we are conscious of the challenges that lie ahead, both in terms of what we want to do and how much it will cost. Clearly, the questions are: "So why bother building a new plan at all? Why is it so important to do these things, anyway?"

The Alberta Energy Regulator has recently taken measures to define what a world-class regulator should be in order to be effective and maintain its social partnership. That's good regulatory news in Alberta, but as we scan the regulatory landscape there's clear pressure on regulators across Canada to better fulfill their mandates.

Ordre des ingénieurs du Québec (OIQ) faces serious pressure from its oversight body, Office des professions du Québec. OIQ has now been directed to overhaul its governance and other processes to enable it to attract and retain high-quality employees and to better protect the public. OIQ announced that it was going to raise Member dues by $100 to pay for the changes. This created a veritable rebellion within its ranks, which has resulted in significant upheaval in its leadership.

In British Columbia, the review of the failure of the tailings dam at the Mount Polley mine suggests steps could have been taken to prevent this environmental disaster. Sharing such lessons learned is critical in creating a climate of learning within our professions. Nevertheless, APEGBC Members recently rejected their Council's attempt to initiate a professional development program — the precise type of program needed to ensure the communication of professional learnings and therefore help prevent failures like the one at Mount Polley.

Professional Engineers Ontario (PEO) did an outstanding job of working with the Elliot Lake Inquiry following the collapse of the Algo Mall parkade, a collapse that killed two people. Although many of PEO's recommendations are still being considered for implementation, some PEO Members do not support implementing their own self-regulating organization's recommendations.

CEO's Message

In Alberta, we know we need to strengthen our current regulatory systems and tools, and we're working on that. But we also have to evolve to counter emerging regulatory threats such as those mentioned above. If we don't figure out how to do it ourselves, we could find ourselves in the unenviable position of being directly regulated through other forms of government oversight.

Addressing the priorities of the 2017—2019 strategy is important work — important work that requires resources. And while people are understandably sensitive when the issue of resources arises, I offer the following in regards to our main source of resources: our annual Member dues.

As many of you know, APEGA currently charges dues that are about average when compared to our regulatory peers across Canada. Also, our dues are very modest when compared to those of other professional self-regulatory organizations in Alberta. I'm not suggesting that just because our annual dues are lower than almost every other profession in Alberta that we should raise them. But I am suggesting that it is consistent with every other regulator that we fund our regulatory needs.

In short, professional regulation will take more money than it traditionally has.

To strengthen our existing regulatory functions and to develop a more robust capacity to address emerging regulatory issues, as well as to execute on APEGA's strategy, we will need to significantly increase revenue starting in 2017. While we have not discussed detailed options with Council, I could foresee a scenario where we would need to increase APEGA's current overall revenue by more than 50 per cent by year 2020. This could potentially include an increase to Member dues of $200 to $300!

To prepare for the future, starting in 2016 APEGA will conduct a review of its revenue structure, aimed at building a more appropriate funding model to sustain the regulation of the professions. It will include a review of the application fee structure to develop a fee-for-service approach, linking the costs of applications for licensure proportional to the amount of effort and services needed to process them.

While I expect that some Members will have questions and concerns about this review, there will be no changes to any of our existing funding approaches without a substantive dialogue within APEGA's Council and without Council's approval. Over the next year, should you have questions or comments regarding the future of APEGA's finances, I remain at your service to answer those questions and to understand your thoughts on our future and any implications there may be for self-regulation.

I anticipate that there may be a significant response to this article, especially in the context of global economic factors, their impact on Alberta's economy, and the fact that many of our Members are losing their jobs. Please send me your comments at the email address below. I will do my utmost to respond to all of them, but if the demand is high I might not be able to do so directly. I do commit myself, however, to reading them all.

Questions or comments?
ceo@apega.ca

It's almost time for APEGA's

Friday, February 19, to Sunday, March 20, 2016

Have you reset your password yet?

On September 28, 2015, APEGA reopened the Member Self-Service Centre (MSSC) at apega.ca. If you've attempted to login since then, you know that you were required to reset your password to gain access to your account.

If you haven't been to the MSSC since then, please go there now — particularly if you plan to vote during the election. APEGA's electronic voting system is run through the MSSC.

Visit apega.ca to get to the MSSC.

Need Password Reset Help?

Call 1-800-661-7020 and press 2 when prompted.

APEGA

Nominations Set for Election 2016

The self-nomination period is now over and the list of candidates for APEGA's Election 2016 is set. In all, 11 APEGA Professional Members are seeking three-year terms on Council. Three other Members are in the running for President-Elect/Vice-President.

Bylaw amendments approved in 2015 allowed APEGA's Nominating Committee to review all candidates (self-nominated as well as those it recommends) at the same time. The new process also allows the committee to identify those candidates that it endorses. This is significantly different than process used in past elections.

Your new President will be Steve E. Hrudey, P.Eng., PhD, FEC, who will officially take office at the APEGA Annual General Meeting, April 22, 2016, in Edmonton. Dr. Hrudey was the successful President-Elect candidate in the 2015 election. Connie Parenteau, P.Eng., FEC, FGC (Hon.), will continue on the APEGA Executive as Past-President.

Names of all 2016 candidates were announced in a December e-PEG, available online at apega.ca. Full candidate statements will be published in the spring edition of *The PEG*, to be distributed in February. The spring edition will also include complete voting information. In January, APEGA will post candidate and further voting and election information at apega.ca and in the Member Self-Service Centre, accessible through the APEGA website.

Polling will be open:

Friday, February 19, to Sunday, March 20, 2016

If you have questions about the election, please call us at 1-800-661-7020. During polling, we will have someone available to answer your questions 24/7. You can also email us anytime at elections@apega.ca and we will get back to you within two business days.

ELECTRONIC VOTING

To vote in the election, you will need to access your account in the Member Self-Service Centre (MSSC). For security reasons, on September 28 APEGA began requiring that Members reset their passwords.

If you haven't reset yours yet, please do so in time to cast your ballot.

If you need assistance with your password reset, call 1-800-661-7020 anytime and press 2 when prompted.

NOTICE OF ANNUAL GENERAL MEETING

In accordance with Bylaw 16(2) of *The Engineering and Geoscience Professions Act*, official notice of the Annual General Meeting is hereby given.

Friday, April 22, 2016 | 2 p.m.
Shaw Conference Centre
Edmonton, Alberta

Attendance Qualifies for CPD Credit

Luncheon 11:30 a.m. – 1:40 p.m. | See pages 41-43 for more information on APEGA Summit 2016 Annual General Meeting & Conference

Proudly brought to you
by Professionals in
Engineering and Geoscience

APEGA

www.apega.ca

A NEW YEAR, A NEW OPPORTUNITY TO HELP OUR YOUTH

The holiday season has ended, but there's still time to give back.

With your donation, the APEGA Education Foundation is able to fund outreach programs that help students reach their full potential by sparking their interest in the engineering and geoscience professions.

Donate today at **apegaeducationfoundation.ca** or call **888-262-3688** for more information.

APEGA | education FOUNDATION

Building a Female Engineering Foundation

Operation SMART in Fort McMurray, a program supported by the APEGA Education Foundation (AEF), introduces girls to engineering by encouraging them to explore, ask questions, solve problems — and get their hands dirty

-photo courtesy Girls Inc.

BY **CORINNE LUTTER**
Member & Internal Communications Coordinator

Building geodesic domes, newspaper towers, and robots is tons of fun. But for Layla Dillon, 11, the best part about taking part in Operation SMART (Science, Math, and Relevant Technology) was meeting real-life engineers and learning about what they do at work.

Design buildings? Check.

Develop websites? Check.

TOWER TIME
Operation SMART participants learn how to manage project resources by building towers using only newspapers.

Optimize assembly lines? Extract oil from sand? Convert raw materials into everyday products? Check, check, and check.

"I think it would be interesting to go into engineering, and there are lots of different jobs that you can do when you finish (school)," says Layla.

She was one of 30 girls, aged 12 to 14, who took part in the nine-week program this fall. It's one of several programs offered by the Fort McMurray branch of Girls Inc., a non-profit organization that empowers young women in Canada and the U.S. to break free from gender stereotypes and develop their confidence.

Operation SMART started in Fort McMurray four years ago, through the volunteer efforts of several APEGA Members. Three-hour sessions are held on Saturdays from late September through November. A variety of hands-on activities — like egg drop challenges, circuit construction and building Rube Goldberg machines — give students a chance to explore, ask questions, and solve problems.

"It's fun — brainstorming ideas and learning new ways of doing things," Layla says.

Thanks to a $4,000 grant from the APEGA Education Foundation (AEF), the program was able to expand its curriculum in 2015. This allowed the addition of an extra class — computer science and web development. On the final day of the program, students got to create their own website, girlsincsmart2015.com, a place for sharing their favourite Operation SMART experiences.

"Our goals are to give the girls an idea of what engineering is and introduce some of the different disciplines within engineering," says D'Andre Wilson-Ihejirika, P.Eng. She designed the Operation SMART curriculum and coordinates its volunteers, most of whom are APEGA Members.

YOUR GIFT TO THE PROFESSIONS

The APEGA Education Foundation makes it easy for Professional Engineers and Professional Geoscientists to give back to professions that have enabled them to enjoy fulfilling and rewarding careers.

When you give to the foundation, you're investing in the future of the engineering and geoscience professions. Your gift will live on in perpetuity — not only through endowments created and built through your support, but through the meaningful work of young people entering the professions, creating wealth, sustaining the environment, and enhancing the quality of life in our communities.

FOUR WAYS TO DONATE

- Attach a cheque for the foundation to your annual APEGA membership renewal form and mail it in.
- Donate online through the APEGA Member Self-Service Centre.
- Donate online or begin monthly donations through CanadaHelps.org.
- Download a donation form from the AEF website at apega.ca/AEF and mail in a cheque.

During classes, lively talks about engineering concepts and project management augment the hands-on learning. "Students have to think about the problem they're trying to solve, how much time they have to solve it, the budget they have to stick within, the materials available to them, and other factors," says Ms. Wilson-Ihejirika.

The all-girl environment lets girls be girls. "It allows them to be in a safe space where they can learn and make mistakes, and they don't have to feel like they're being judged in any way."

Ms. Wilson-Ihejirika, currently on maternity leave from her job as a project development lead with Suncor Energy Inc., is a passionate supporter of science, math, engineering, and technology (STEM) education. The founder of BrainSTEM Alliance — a company that helps organizations incorporate STEM into their programming — she offered to help Girls Inc. get Operation SMART off the ground.

"I thought it would be good to expose girls in Fort McMurray to engineering, especially with all the oil sands activity here. A lot of the local industry is based around engineering, science, and math," she says. "I wanted to work with Girls Inc. so we could put this program in place, so the girls could see that there's a lot of career opportunities right here in their hometown."

As a young girl in the Bahamas, Ms. Wilson-Ihejirika didn't know much about engineering. "I just ended up choosing engineering because I had to choose something to study," she says. "I had always liked math and science, especially chemistry. I kind of stumbled upon engineering and said, OK, let's try this out. Then I went to university and realized I really liked it."

She came to Canada in 2006 to study chemical engineering at McGill University in Montreal, then, at the University of Toronto, completed a master's degree in chemical engineering and applied chemistry. An internship with Suncor brought her to Fort McMurray. Soon she was volunteering with Operation SMART.

"We really want to expose girls to engineering and show them that it can be fun — show them the creative side of engineering and how they can make a difference," says Ms. Wilson-Ihejirika.

Word is getting out and demand is growing. Since its inception four years ago, Operation SMART has increased to 30 participants from 10, About 20 volunteers — mostly female P.Eng.s and Engineers-in-Training — are vital to the program's success.

"The girls get to meet a bunch of female engineers. They see women can do these roles just as well as men can and are comfortable doing them," says Ms. Wilson-Ihejirika.

Chemical engineer Loree D'Orsay, P.Eng., is one of those volunteers. She works with Ms. Wilson-Ihejirika at Suncor and has been an Operation SMART volunteer from the beginning.

One of her aims is to help girls build confidence in themselves and their abilities. "I've heard a lot of girls say they can't do math. That it's a boy thing. So every message and every example that you can give a young girl — that they're just as capable as boys are — is important. By exposing girls to women who have gone into the engineering field — that's a strong message that they can achieve their dreams."

Ms. D'Orsay still remembers when engineering students visited her high school in Nova Scotia. One of them pulled a ballpoint pen out of his pocket and talked about all the engineering that went

MAY THE FORCES BE WITH YOU
Operation SMART volunteer Amie McGowan, P.Eng., discusses force and energy with participants as they design Rube Goldberg machines.
-photo courtesy Girls Inc.

DIVERSITY STEPS

The APEGA Education Foundation funds several Alberta outreach programs — like Operation SMART — that encourage students to explore math and science and to imagine their futures in the engineering and geoscience professions. Outreach programs are the first step to ensuring healthy and diverse professions.

As part of its new business plan, the foundation — a Member-run group that operates at arms-length from APEGA — aims to increase its outreach funding from $95,000 to $145,000 annually. This will help attract more Alberta youths, especially girls and Aboriginals, into Professional Engineering and Professional Geoscience careers.

into designing and manufacturing the seemingly simple tool. "I was hooked."

That's the feeling she hopes Operation SMART participants will get. It's another reason why interactive activities are so important.

"Seeing how something works and doesn't work allows them to grasp concepts easier, rather than just talking about things," Ms. D'Orsay says. "We encourage them to speak their minds and talk about what they're learning. Giving them an opportunity to take the lead on projects builds their confidence."

Of course, there are always some girls who are resistant to the program — at first, anyway. One such participant let it be known how boring she thought the classes would be.

Recalls Ms. D'Orsay: "After we started doing some of the activities, we couldn't get her to stop and go home. The girls were building roller coasters using marbles — the more tricks and loops they had, the more points they got. She wanted to improve her design. Just seeing that passion develop is really rewarding."

To see the world of engineering through fresh eyes is also gratifying, she says. "It takes you back to a simpler place. I always leave with a big smile on my face."

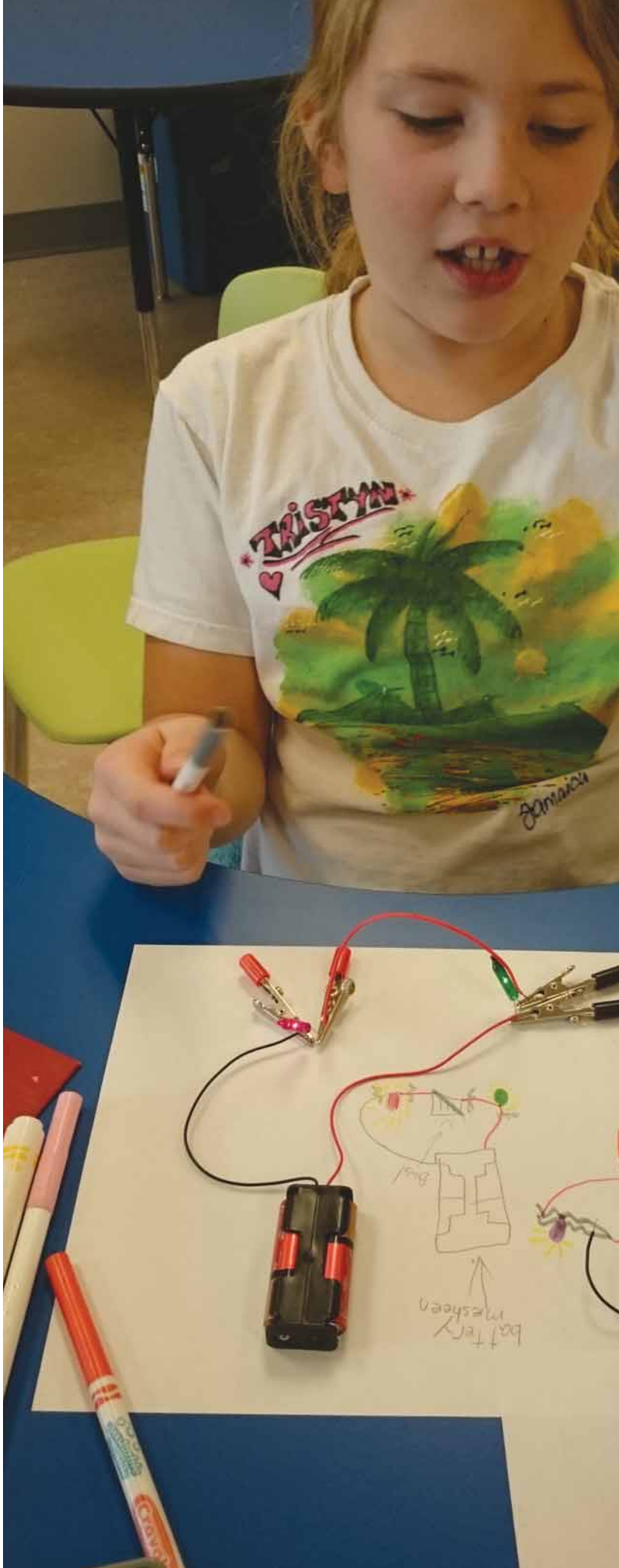
This year was the first time Ivy Zhang, E.I.T., volunteered with Operation SMART. Also with Suncor, the civil engineering E.I.T. wanted to share her love for engineering with young students. She taught the girls about buildings, bridges, and geometry while they created structures with straws, tape, and the construction toy system K'NEX.

She inspired the students — and they inspired her.

"Sometimes the girls came up with designs that were a bit weird — or might not work — but they tried them anyways. I learned from them to always keep my mind open to different ways of solving problems and to be enthusiastic about my work," she says.

Ms. Zhang grew up in a family of engineers. Both her parents and an uncle were early role models in the profession. They showed her that engineering is a fulfilling career. So, too, did her professors and the supervisors that she worked under during her summer student terms. "They were all people who were passionate about engineering and encouraged me to always strive to be the best I could be," she says.

By volunteering with Operation SMART, Ms. Zhang hopes to do the same for its participants. "My hope is that they take



CIRCUIT TRAINING
Students learn about electrical engineering by creating a simple circuit and drawing a circuit diagram.
-photo courtesy Girls Inc.

these memorable experiences into consideration as they begin to plan their further education and careers. That they can picture themselves in STEM fields once they've had a chance to interact with female role models who are like an older version of themselves."

Even though more women are choosing STEM careers all the time, significant gaps remain. At the post-secondary level in Canada, about 20 to 30 per cent of engineering students are female, depending on the school. That number increases to about 45 per cent for geoscience. In the workplace, the number drops even further. Yet only about 14 per cent of APEGA's Professional Members are women.

By offering a supportive environment, Operation SMART aims to remove obstacles that might keep girls from discovering STEM opportunities before they even know or understand what they're all about.

GETTING PAST THE YUCK FACTOR

One of those obstacles? The yuck factor.

"Girls get to a certain age and think they aren't supposed to get dirty or messy. It's a message that they get — girls have to be neat," says Girl's Inc. Executive Director Ann Dort MacLean.

At Operation SMART, though, that stereotype is checked at the door. Whether they're building electronic flip-flops that light up when you walk, making slime, or cleaning up broken eggs that didn't survive the egg drop, girls are encouraged to dive right in.

"We want them to connect with the fun part of it and not worry about the yuck part of it," says Ms. Dort MacLean.

Another strategy of Operation SMART: Let participants make big, interesting mistakes. Rather than protecting them from failure, Operation SMART encourages students to solve problems on their own — ask questions, assess risks, and take chances

"Some of the best inventions happened because of mistakes, especially in science," explains Ms. Dort MacLean. "It's important for kids to know that it's OK to make mistakes, as long as you learn from them. You don't have to be perfect. You just have to analyze and figure it out. Because that's what engineering is all about: identifying and solving problems."

Although it does include individual learning activities, a big part of Operation SMART is team building. Group projects help encourage collaboration and cooperation. Teams may compete against each other in challenges, but they work together afterwards to analyze their projects and propose solutions.

"There's a lot of dialogue and conversations, so the girls really feel like it's their program," says Ms. Dort MacLean.

It's all about reconnecting girls with science.

"Up until about age 12, girls are as interested in science, and as good in science, as boys are. When they hit 12, the message that

> "The girls get to meet a bunch of female engineers. They see women can do these roles just as well as men can and are comfortable doing them"
>
> **D'ANDRE WILSON-IHEJIRIKA,** *P.ENG.*
> *Operation SMART*

they're getting, either subliminally or directly, is that science isn't something that girls are good at, that they do, or should want to do. We want the girls to develop the strength and the skills to make their own decisions."

IT'S COMPLICATED

After taking part in Operation SMART, 11-year-old Gabriella Gonzalez isn't ready to commit to an engineering career just yet.

But she has a much better appreciation for what Professional Engineers do. "I would describe engineers as complicated," she says. And her love of science is growing.

"My favourite activity was when we got to build a structure out of spaghetti and marshmallows. The building we made was really tall but it wasn't very stable," she says. Still, her team learned a valuable lesson from that miscalculation: triangles are the strongest shape.

"You learn something new in every class," she says. "It's fun to solve problems using my own ideas and creativity."

FAN GIRL
Applying electric circuit concepts to build a battery powered fan.
-photo courtesy Girls Inc.

The Buzz

ALBERTA BUDGET BOOSTS INFRASTRUCTURE SPENDING

Alberta infrastructure projects were updated ina big way by the provincial government, in its 2015 budget tabled in October. The province says the investment — a 15 per cent increase in capital spending that adds up to $34 billion over the next five years — will drive job creation in the engineering and construction industries, which have been hit hard by the energy sector slowdown. Included in the funding is $3.8 billion for schools; $4.7 billion for roads and bridges; $2.2 billion for health facilities and equipment; and $4.4 billion for other new projects and programs.

Smaller municipalities will get $119 million to support rehabilitation and construction of roads and bridges through the newly restored Strategic Transportation Infrastructure Program. The remaining $4.6 billion for roads and bridges will go to projects throughout the province, including $2.9 billion for the Edmonton and Calgary ring roads. Calgary's ring road is set to be complete in 2022, while the final northeast portion of Anthony Henday Drive in Edmonton will be done next year. Also included is funding for work on Highways 63, 28, and 19.

Another major project — the Calgary Cancer Centre, featured in the fall *Buzz* — will get $830 million, although that falls short of the estimated $1.3 billion total cost. The province says the centre, which was expected to open in 2020, will now open in 2023-2024.

The 2015 budget featured a record $6.1-billion deficit. The province will run $18 billion in operational deficits to the 2019-20 fiscal year, but plans to balance its books after that.

-Corinne Lutter

TRANFORMATION AHEAD FOR WHYTE AVENUE BROWNFIELD

Edmonton's Whyte Avenue has continually evolved over the last two decades, with the arrival of new restaurants, pubs, and shops. Building facades have undergone facelifts and new structures have appeared, transforming the historic area into one of the city's hippest neighbourhoods. But all the while, the fenced-off lot at the southeast corner of 105th Street has remained undeveloped.

The former site of a gas station underwent nearly 20 years of remediation because of contamination from leaking tanks. With the site now cleaned up, Calgary developer Wexford Developments has announced plans to transform the brownfield into a 132,000-square-foot mixed-use development. It will be called the Raymond Block, after the Raymond Hotel that occupied the site in the 1900s.

The $40-million project will offer 21,000 square feet of retail, restaurant, and office space on its bottom two storeys and 96 luxury apartments on its top four floors. Designed by the APEGA

PRIME TIME
Raymond Block, a new development on Edmonton's trendy Whyte Avenue, will soon be built at the site of a former gas station. It took nearly 20 years of remediation work to clean up the prime real estate, which was contaminated by leaking gas tanks.
-artist's rendering courtesy Wexford Developments

Permit Holder DIALOG, the Raymond Block will have a facade that resembles nearby historic buildings.

-Caitlin Crawshaw

BRIGHT DAYS FOR CALGARY'S SOUTHLAND LEISURE CENTRE

The City of Calgary is making the most of Alberta's sunny climate. In September, the city unveiled its largest solar panel installation so far, a 600-panel system on the roof of Southland Leisure Centre. It was built in partnership with ENMAX's Enhanced Energy Services Program.

About the size of an NHL hockey rink, the $380,000 installation will produce between 161,000 and 184,000 kWh of electricity annually. That's enough to power 24 homes a year — although these panels will be helping offset the leisure centre's costs. In fact, the city expects the system will pay for itself in 14 years. Southland is also being used as a test site, as the city explores options for more solar projects for its new and existing buildings.

-Jacqueline Louie

PILOT PLANT PUTS CARBON CAPTURE TECHNOLOGY TO THE TEST

An Alberta-based company is breaking new ground with the development of new carbon capture technology that grabs CO_2 from the atmosphere and turns it into fuel. Carbon Engineering is testing the patented technology at its newly opened pilot plant in Squamish, B.C. The $9-million facility will capture about one tonne of CO_2 per day, the equivalent of taking 100 cars off the road each year. But the ultimate goal is to prove the technology can work on a much greater scale.

It works by moving large volumes of air through equipment that absorbs CO_2 in a liquid solution, then transforms the solution into calcium carbonate pellets. After the pellets are heated to about 900 C, they break down and release pure carbon, which can be used to produce synthetic fuels. If all goes well, the company plans to build a first-of-its-kind commercial plant around 2017.

Carbon Engineering was founded by Harvard climate scientist David Keith and is backed by a notable list of investors, including Bill Gates.

-Jacqueline Louie

SLASH CARBON EMISSIONS, WIN XPRIZE

Speaking of CO_2, the NRG COSIA (Canadian Oil Sands Innovation Alliance) Carbon XPRIZE is calling on entrepreneurs, companies, and researchers to convert carbon emissions into something that's useful to the world. The goal: to slash greenhouse gas emissions.

America's largest independent power producer, NRG Energy Inc., and several of Canada's largest oil sands producers are donating a total of US $20 million to fund the challenge.

-Jacqueline Louie

SHELL'S QUEST REDUCES CARBON EMISSIONS

Shell Canada has officially opened Quest, the world's first oil sands carbon capture and storage (CCS) project. The $1.35-billion project captures CO_2 from Shell's bitumen upgrader near Fort Saskatchewan, then pipes its 65 kilometres north to Thorhild County, where its pumped over two kilometres underground and permanently stored in rock formations.

Since testing began in September, over 200,000 tonnes of carbon has already been sequestered. The system is designed to store more than one million tonnes of carbon emissions per year, or about one-third of the emissions produced by the upgrader. To put it into perspective, that's about the same amount of emissions created annually by 250,000 cars.

Quest was financed by Shell and its partners, Chevron Canada and Marathon Oil Canada, as part of their effort to reduce the effects of global warming. The provincial government also contributed $745 million for construction and operating costs for the first 10 years, while the federal government provided $129 million for engineering and design work.

-Corinne Lutter

CHINESE FREIGHT COMPANY PICKS EDMONTON AS ITS CANADIAN HUB

Air China Cargo has chosen Edmonton for its first freight service between

TURNING CO_2 INTO $CaCO_3$ (left)
Jane Ritchie, P.Eng., Lead Process Development Engineer with Carbon Engineering, shows the company's pellet reactor system, which takes carbon dioxide captured from air, and turns it into calcium carbonate beads for further processing.

FUEL FOR THOUGHT (above)
Inside the Carbon Engineering pilot plant, where carbon dioxide is transformed into fuel.

-photos courtesy Carbon Engineering

mainland China and Canada. Since September, the carrier has been landing at the city's airport, transporting everything from live animals to electronics to oil and gas equipment. Besides connecting Edmonton directly to Shanghai, the service delivers freight between Alberta and Texas.

Edmonton was picked because of its sophisticated transportation network and government support. Although not a household name in Canada, Air China Cargo is one of the top cargo companies in the world, with 175 destinations and 1,285 global truck routes.

-Caitlin Crawshaw

FLOOD MITIGATION APPROVED FOR CALGARY AND NEIGHBOURING COMMUNITIES

A major reservoir and several other flood mitigation projects have been approved as part of a provincial plan to protect Calgary and upstream communities from severe flooding along the Elbow River. The work — which comes with a $297-million price tag — will help protect the communities from the type of severe flooding that hit southern Alberta in June 2013 and caused $6 billion in damage. The province is also providing Calgary with an extra $150 million over 10 years for other local flood mitigation projects.

Since the 2013 flood, which was the costliest natural disaster in Canadian history, dozens of mitigation ideas have

been proposed by municipalities, consultants and residents. A research firm from the Netherlands, hired by the province, concluded the $264-million Springbank Off-stream Reservoir, combined with $33 million in local mitigation projects in Bragg Creek and Redwood Meadows were the best options. Other ideas that have been dismissed include a dry dam upstream at the confluence of McLean Creek and the Elbow River, and a diversion tunnel under the city.

Preliminary engineering work has begun on the 70.2-million-cubic-metre reservoir, located about 15 kilometres west of Calgary. This, combined with other flood mitigation efforts and improvements to the Glenmore Reservoir, would protect against a 2013-level flood. Work in the smaller communities may include dikes and drains. Landowners impacted by the reservoir plan to fight the development as it moves through the environmental assessment stage.

A Bow River working group has been established to investigate other flood mitigation and watershed management solutions. Five new studies are also underway to identify river hazards and develop new flood inundation and hazard maps for the Bow, Elbow, Sheep, Highwood, and Peace Rivers.

-Corinne Lutter

GREEN TRANSIT COMING TO MEDICINE HAT

Medicine Hat is getting more than $14 million from the province's Green Transit Incentives Program to improve public transit in the city. The GreenTRIP funding, announced in early November, is for 36 new buses and other improvements to the transportation network that will make public transit more comfortable, safe, and accessible.

The city just renovated its Transit and Fleet Services Building so it could switch to buses fueled by compressed natural gas, which increases efficiency and produces fewer emissions than diesel.

-Corinne Lutter

-photo courtesy City of Calgary

-photo courtesy Business Wire

RAY CATCHERS (top)
Located atop the Southland Leisure Centre, the City of Calgary's largest solar panel installation will produce between 161,000 and 184,000 kWh of electricity each year.

200,000 TONNES AND COUNTING (bottom)
Since September, Shell's Quest Carbon Capture and Storage (CCS) project has already sequestered over 200,000 tonnes of CO_2 in underground wells.

BY **GAIL HELGASON**
Freelance Contributor

SCIENTISTS DISCOVER WORLD'S LONGEST CHAIN OF VOLCANOES

Australian scientists have discovered the world's longest chain of continental volcanoes, according to the Australian National University in Canberra.

The 2,200-kilometre chain across eastern Australia was created over the last 33 million years. It is nearly three times the length of the Yellowstone hotspot track in North America, says research leader Dr. Rhodri Davis of the Research School of Earth Sciences.

This volcanic activity is surprising because it occurs outside of tectonic plate boundaries, where volcanoes usually are found. The research, reported in the journal *Nature*, could help scientists better understand the movement of the continents throughout Earth's history.

CAMPUS EARNS ITS WINGS WITH GLOBAL PROJECT OF THE YEAR

Is that a winged flying saucer? That's one way onlookers have described the first building developed on Florida Polytechnic University's new campus. The 15,050-square-metre Innovation, Science and Technology Building has been named Global Project of the Year by the *Engineering News-Record* (New York).

It features a curvilinear roof with 94 aluminum sunshades in the shape of wings. Powered by hydraulic cylinders, they move with the sun to provide either light or shade inside the building. Engineering for the $60-million project was provided by Thornton Tomasetti, Anderson Lane and TLC Engineering for Architecture. The building was designed by famed architect Santiago Calatrava.

ENGINEER, CHEERLEADER AND MOM DESIGNS CHILD-SAVING CLIP

Electrical engineer and former cheerleader Marcie Miller of Chandler, Ariz., has given parents something to cheer about. Ms. Miller, employed by Intel, has invented a device to prevent the deaths of children in hot cars, *TODAY Parents* reports.

The Intel Smart Clip is equipped with sensors, and it clasps onto a child's car seat. If a parent walks away with the child still in the seat, an app on the parent's smartphone sounds an alarm.

Ms. Miller, who was a cheerleader for the Arizona Cardinals professional baseball team, says her family helps inspire her work. Having a daughter recently brought home the danger of hot cars. More than a dozen children die in hot cars each year in the United States, often because the caregiver has forgotten the child is in the rear seat.

ENGINEERING PROGRESS MADE IN MEDICAL PROSTHETICS

Thanks to researchers at the National University of Singapore Faculty of Engineering, medical prosthetic devices may soon become more flexible and comfortable. The researchers have developed a wearable, liquid-based sensor that is small, thin, and flexible — not to mention durable and cost effective to produce.

Conventional tactile sensors often restrict natural body movements and fail or wear out easily. The university says the newer technology has wide applications for smart medical devices, wearable consumer electronics, robotics, and more.

Biomedical engineering researchers at North Carolina State University (Raleigh, North Carolina) have also achieved recent progress in this field. The researchers there have developed software allowing powered prosthetics to tune themselves automatically.

As prosthetics must be customized for individuals, this innovation is expected to improve comfort and reduce fitting times.

HOT DESKING HIGHLIGHTS WORLD'S SMARTEST OFFICE SPACE

Does your dream workplace include peace and quiet, lighting and temperatures customized to your individual needs, and changing work spaces to fit your schedule? Then you might want to check out The Edge, an Amsterdam office building being hailed as home to the world's smartest office space.

The 2,500 employees of Deloitte, the building's main tenant, share 1,000 desks, a concept called hot desking. When employees arrive each morning, sensors guide them to a parking spot, then to the best work area based on their schedule. Possibilities include a sitting or standing desk, a work booth, a meeting room, a balcony seat, and a concentration room. *Bloomberg News* (New York) reports that the building, developed by OVG Real Estate, contains 28,000 of these sensors.

Employees use their smartphones to adjust light and temperatures to their individual preferences, find colleagues, and even manage exercise routines.

Cited as the world's greenest building by a British rating agency, The Edge also features super-efficient LED panels powered by Internet cables, and solar panels that produce more electricity than the building uses.

-artist rendering courtesy Ronald Tilleman/OVG Real Estate

3D PRINTING HITS A HIGH NOTE

Here's music to the ears of those following the growth of 3D printing technology: a French musician and engineer has developed an electric violin using a classic Stradivarius as his prototype, reports *CCTV News*.

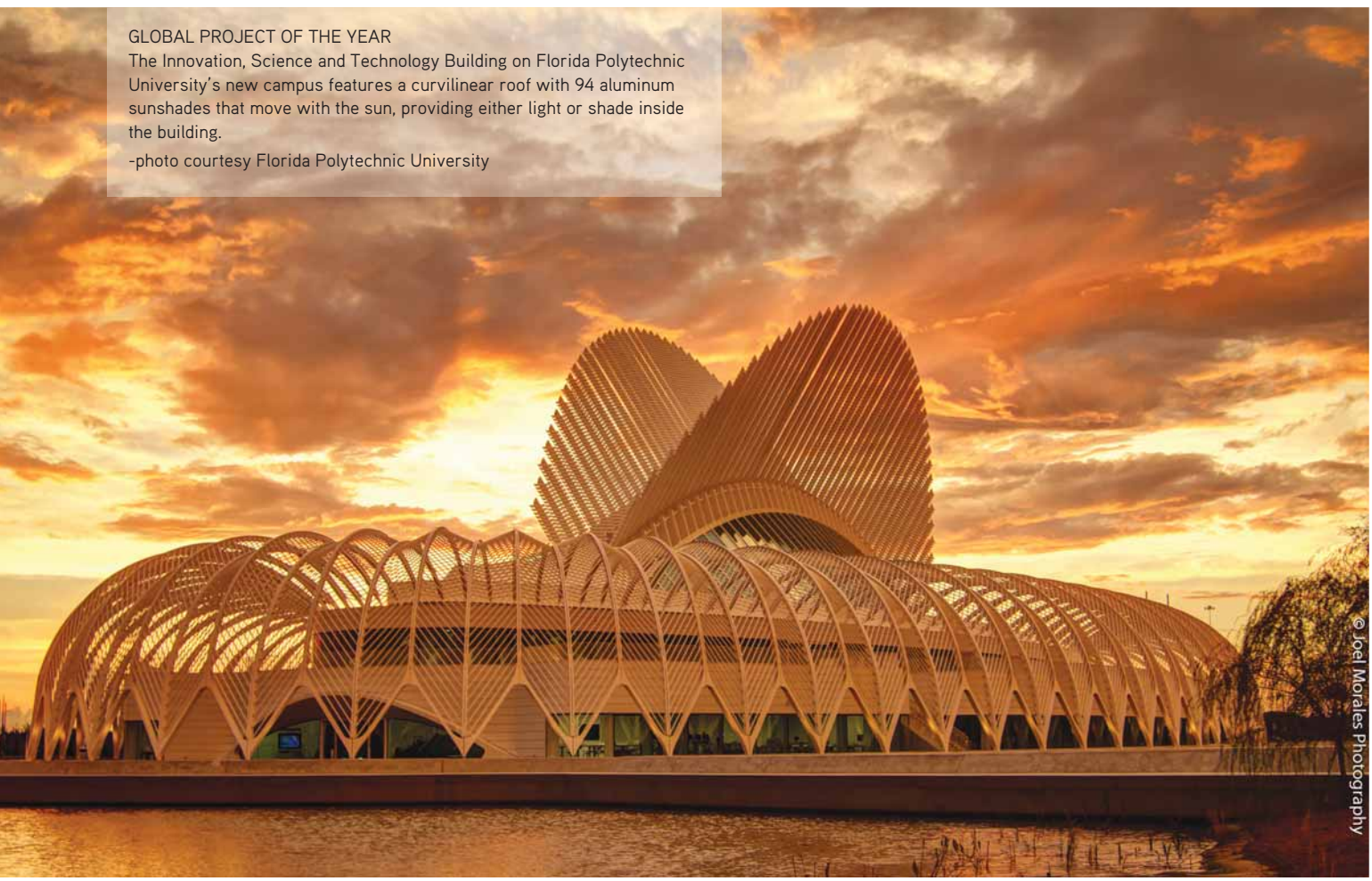
Laurent Bernadec made the instrument using translucent resin and a process called stereolithography, which creates objects by fusing together layer upon layer of thin materials. Trained as a mechanical engineer as well as a violinist, he says the instrument is lighter than other electric violins and sound waves are not impeded by glues and screws.

In other signs of 3D printing's growth, a Swedish 3D manufacturer, Arcam AB, reports difficulties in keeping up with orders for engine makers and airplane manufacturers creating parts. As well, the *Economist* (London) reports that researchers at the Massachusetts Institute of Technology have recently succeeded in using glass instead of plastic to print objects like optical prisms.

WORKING ON THE EDGE
The Edge, a revolutionary office space in Amsterdam, is touted as the world's smartest office space. It's also been assessed the greenest building in the world by British rating agency BREEAM, which gave it the highest sustainability score ever awarded at 98.4 per cent.

GLOBAL PROJECT OF THE YEAR
The Innovation, Science and Technology Building on Florida Polytechnic University's new campus features a curvilinear roof with 94 aluminum sunshades that move with the sun, providing either light or shade inside the building.

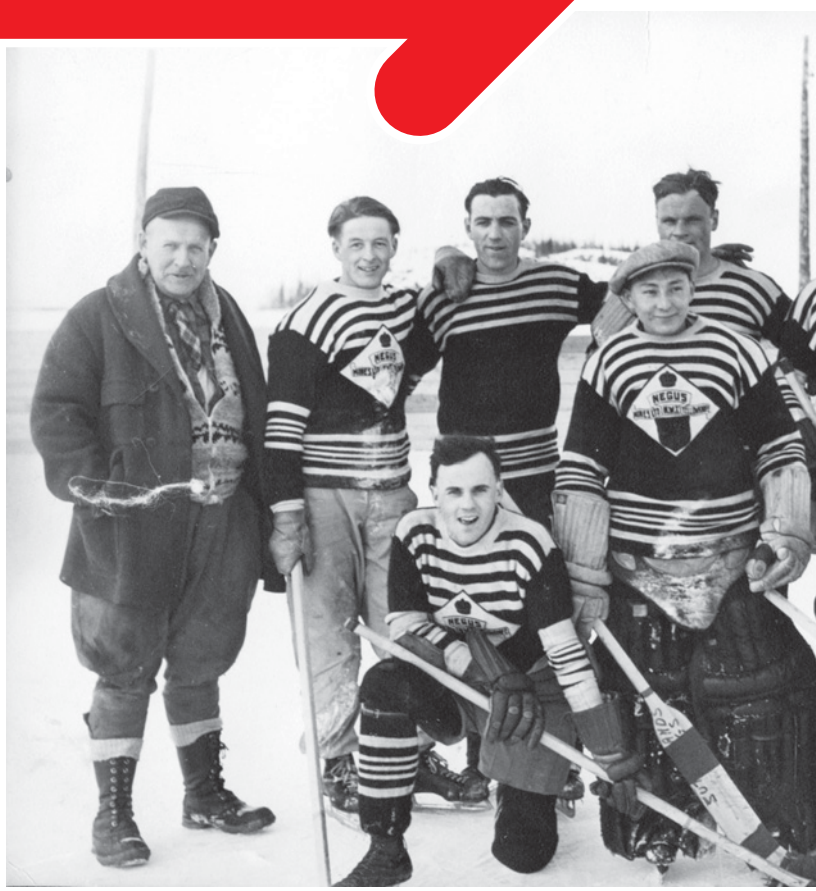
-photo courtesy Florida Polytechnic University



© Joel Morales Photography

Movers&Shakers

COMPILED AND WRITTEN BY **GILLIAN BENNETT**
Content Developer



LIFE MEMBER'S LIFE OF ADVENTURE

He has borne witness to, and taken part in, some of the most influential events of the past century. A Member of APEGA for 58 years, **Thomas Morimoto, P.Eng.**, was honoured for his 97 years of life adventures with an Alumni Honour Award from the University of Alberta on September 24.

Born in 1918 in Edmonton, Mr. Morimoto grew up in Fort McMurray, where his father had a barber shop, and later he farmed potatoes and hunted muskrats there. Fort McMurray at that time was a gathering place for eccentrics and adventurers, the U of A reports. He met his fair share, including two governor generals, bush pilots and Mountie Alfred King, famously shot by the Mad Trapper Albert Johnson.

While trading muskrat skins near Fort Chipewyan, Mr. Morimoto found a position as a radio operator with Canadian Airways' northern operations. He had learned Morse code and manned the radio at a small-scale plant at Bitumount, where the first oil sands separation plant was developed by private industry. Later, he worked in Robert Fitzsimmonses' oil sands plant, where he began to consider a career in oil and gas.

In the 1930s, Mr. Morimoto travelled to Yellowknife to stake his claim after gold was discovered. He worked in the Negus mine for a while, sampling rock and supplying rock to the miners.

With the escalation of the Second World War, Mr. Morimoto felt it his duty to enlist. He tried to join the air force, but at 5-2 and 119 lb., he didn't meet the height and weight requirements. A friend, who was a lieutenant, suggested his radio skills might be of use in the signal corps. He applied, and with the lieutenant's help, had an extra couple inches added to his height record to meet the 5-4 minimum requirement. The weight requirement was overlooked — the doctors conceded he was from the North and probably hadn't had much to eat.

Mr. Morimoto joined the 3rd Canadian Division as a radio operator. To this day, he is believed to be the only person of Japanese descent to have taken part in the D-Day landings on Juno Beach.

Despite his war contributions, Mr. Morimoto faced discrimination for his Japanese heritage, both during and after the war. At a rehabilitation course, he was told he wouldn't get into university because of his ethnicity. He applied anyway and was accepted into chemical engineering at the University of Alberta. After completing a bachelor's degree, he was hired by the fuels division of the Research Council of Alberta to work on reducing the ash content of coal. He continued his studies, obtaining a master of science degree in chemical engineering while also working as an assistant research engineer.

After university, Mr. Morimoto worked as an engineer at the Canadian Celanese plant in Edmonton, Polymer Corporation in Sarnia, Ont., and Brown and Root in Calgary. He then became Chief Process Engineer at a new company called Mon-Max. It was a joint venture of Fred Mannix's construction company and Montreal Engineering, Canada's largest engineering firm.

Mr. Morimoto left Mon-Max to work as a consultant until 1977, when he was invited to join a project in Dubai. Canadian oilman Angus Mackenzie had established Scimitar Oils Ltd. as

A LIFE WELL-LIVED
Life Member Thomas Morimoto, P.Eng., has lived through some of the most influential timess of the last century. Pictured as a goalie with a hockey team in the Northwest Territories and, at right, with his wife Kim.
-photos courtesy University of Alberta

part of a joint venture with the Dubai government. The resulting Dugas Project aimed to profit from the natural gas flared from Dubai's oilfields. Mr. Morimoto started as a consultant overseeing the design of the Dugas plant, but soon moved up to Vice-President of Scimitar, where he was responsible for the plant's engineering and operations. As production in the oilfields soared, Dugas produced 30,000 barrels a day of propane and butane and 150 million standard cubic feet of dry gas. The Dugas Project and Scimitar Oils were an international success.

Mr. Morimoto retired from Scimitar in 1987. He wrote a memoir chronicling

UNDER 40 SUCCESSES
James Couto, P.Eng., and Sean Mascarenhas, P.Eng., (right) both demonstrated the leadership qualities necessary to be featured in Control Engineering's Leaders Under 40.
-photos courtesy Autopro Automation Consultants Ltd.

his life and adventures, entitled *Breaking Trail: From Canada's Northern Frontier to the Oilfields of Dubai*. He was also a recipient of the Queen Elizabeth II Diamond Jubilee Medal.

WORLDWIDE RECOGNITION FOR GEOSCIENCE EXPERT

A long-time expert in quaternary geology, **Nathaniel Rutter, OC, P.Geol., FGC, FEC (Hon.)**, became the first recipient of the Distinguished Service Medal from the International Union of Quaternary Research (INQUA) in Nagoya, Japan, last summer.

Dr. Rutter registered with APEGA in 1976 and was appointed Chair of the University of Alberta's geology department in 1980. Today, after 40 years of teaching and research, he's a Distinguished University Professor Emeritus of Earth and Atmospheric Sciences and an internationally recognized authority on topics like glaciation and climate change.

As the first Canadian President of the INQUA, Dr. Rutter founded its official journal — the periodical *Quaternary International* — and was its editor-in-chief for 10 years. He was also Chairman of the INQUA Global Change Committee and was awarded honorary membership in 1999. He has participated in scientific commissions and committees, including the International Geologic Correlation Program Scientific Board of UNESCO, and the International Geosphere-Biosphere Program.

Dr. Rutter has authored over 300 scientific papers and carried out quaternary research in countries including China, Namibia, Russia, Argentina, Mongolia, and France. He has volunteered on APEGA committees since 1986 and currently serves on the board of the APEGA Education Foundation.

He travelled to Japan in July to receive the Distinguished Service Medal from the INQUA, which continues research in fields such as climate change, natural hazards, and civilization.

LEADERSHIP BEYOND THEIR YEARS

They might be young, but two APEGA Members are already garnering attention in *Control Engineering*'s Leaders Under 40 list.

James Couto, P.Eng., is all about improving process and efficiency. He has to be to balance work as the youngest project manager contracted at **Autopro Automation Consultants** and as the president of his own company, **Couto Consulting Ltd.**

Mr. Couto has a diploma of technology in automation and instrumentation from the British Columbia Institute of Technology, and a bachelor's degree in electrical engineering from Lakehead University.

He worked for **TransCanada Pipelines Ltd.** as a project manager before joining Autopro Automation Consultants Ltd. as a junior engineer. Now a project manager and a senior engineer, he has been praised by the company for his mentorship abilities and excellent balance of people and technical skills. His desire to explore a business perspective and move

away from the purely technical side of things led him to pursue an MBA at the Haskayne School of Business.

In addition to his work with Autopro, Mr. Couto owns and operates his own company, Couto Consulting Ltd., in Calgary. With a goal to combine his passion for engineering with a desire to drive renewable energy innovation in Canada, he is currently involved in a new Canadian renewable energy start-up company called Solerta.

Outside of work, Mr. Couto has supported World Vision Canada, Engineers Without Borders, and the Enbridge Ride to Conquer Cancer.

Sean Mascarenhas, P.Eng., progressed very quickly in his career, leading major projects in his first five years. Also on the Leaders Under 40 list, Mr. Mascarenhas graduated with a bachelor in electrical engineering from McMaster University.

As a senior engineer with Autopro Automation Consultants Ltd., Mr. Mascarenhas has proven his ability to lead large projects, such as a large distributed control system upgrade. He is known for consistency when it comes to getting projects done on schedule, and on budget, and to a level of quality that often exceeds expectations.

Recently he was electrical lead on a greenfield project for a major petrochemical producer — the largest project in Autopro's 25-year history. In this role he managed a team of more than 20 technical staff and interfaced with the client and subcontractors to ensure quality standards were met.

Mr. Mascarenhas is also an avid football enthusiast, volunteering as a high school football coach for the past six years and winning a city championship in 2015.

ROYAL WELCOME FOR INTERFACIAL EXPERT

He's a world-renowned expert in interfacial sciences known for the quality, importance, and impact of his work. **Zhenghe Xu, P.Eng.**, has been elected a fellow of the Royal Society of Canada.

PRACTICAL INNOVATOR
Zhenghe Xu, P.Eng., elected as a fellow of the Royal Society of Canada, has a long record of undertaking research with practical applications for industry.

Dr. Xu studied minerals engineering at the Central-South Institute of Mining and Metallurgy in China, before moving to the United States to complete his PhD in materials engineering science. He was an assistant professor at McGill University before moving to Edmonton to join the Department of Chemical and Materials Engineering of the Faculty of Engineering at the University of Alberta. A professor and researcher there for the past 15 years, his main research area is interfacial sciences as applied to natural resources processing and utilization.

Dr. Xu's expertise in mineral processing technology has allowed him to address challenges faced by the oil sands industry. He has used science and technology to advance bitumen recovery and reduce its environmental impact. Dr. Xu's projects always include a path to industrial practice, and his research has been utilized in fields such as oil sands separation, mineral processing, surface and interfacial science, absorption of environmental pollutants, and clean coal science.

In 2009, Dr. Xu was chosen to be part of a Royal Society panel led by **Steve Hrudey, P.Eng., PhD, FEC**, that looked at the environmental and health impacts of Canada's oil sands industry. Dr. Hrudey is President-Elect of APEGA.

Dr. Xu has published over 330 peer-reviewed scientific journal papers and holds three U.S. and one Canadian patent. He is the NSERC Industry Research Chair in Oil Sands Engineering at the U of A and the Canada Research Chair in Mineral Processing. He is a past recipient of the Frank Spragins Technical Award of the APEGA Summit Awards and this year also received the Syncrude Award for Excellence in Sustainable Development.

QUEST TO CAPTURE CARBON

A project by **Fluor Canada Ltd.** has been named Global Best Project for 2015 by *Engineering News-Record*. As reported on *Business Wire*, the Quest Carbon Capture and Storage Project is a commercial processing facility that captures direct carbon dioxide emissions from **Shell Canada's** Scotford upgrader near

Fort Saskatchewan. Fluor was the engineering, procurement, and construction contractor on the project and provided preliminary design services.

Fluor implemented its 3rd Generation Modular Execution approach in the early phases of the project, reducing the facility's plot space by 20 per cent through modularization. The approach reduced the project's capital costs by nearly 30 per cent and reduced disruptions to the existing facility and construction schedule. Despite more than 1.3 million hours on the project, it achieved zero lost-time incidents.

The $1.35-billion Quest project opened in November and is Shell's first commercial-scale carbon-capture-and-storage facility. It is expected to capture and store more than one million tons of carbon dioxide emissions a year. *See the* Buzz *on page 17 for more details on the Quest project.*

Global Best Projects honours the global project teams behind outstanding design and construction efforts.

CRYOBIOLOGY, TRICORDERS, KILLAM AWARDS

When she arrived in Edmonton 19 years ago, **Jane Elliott, P.Eng.**, had never heard of cryobiology. Today, she's a key member of a world-leading research team in the field. She has been awarded a Killam Annual Professorship for her work in cryobiology and thermodynamics.

Dr. Elliot graduated from the University of Toronto with a B.A.Sc. in engineering science and an M.A.Sc. and PhD in mechanical engineering. After completing her PhD, the *UAlberta News* reports she was drawn to the University of Alberta for its strength in colloidal and surface thermodynamics. Joining the U of A's Faculty of Engineering as a professor in the Department of Chemical and Materials Engineering, she was soon exposed to the institution's collaborative atmosphere. A colleague from the Department of Laboratory Medicine and Pathology introduced her to the field of cryobiology — the effect of extremely low temperatures on biological systems — and mentioned the need for thermodynamics expertise.

Cryobiology has a major role in the preservation of cells and tissues for medical transplantation. This led to an interdisciplinary cryobiology research group that explores cryopreserved tissues and their role in transplantation. The team has cryopreserved articular cartilage of the knee, and a new cartilage protocol means the cartilage can now be collected and stored for longer amounts of time. This makes distribution and coordination easier for people needing reconstructive surgeries.

The Killam Professorship also recognizes Dr. Elliot's teaching abilities. She believes there's a strong connection between research and teaching, and often brings her research into the classroom to inspire students to learn more about the subject.

Dr. Elliot currently serves on the editorial board of *Cryobiology* journal. She is the Canada Research Chair in Thermodynamics and has served on the Physical Sciences Advisory Committee for the Canadian Space Agency. Her research was recognized in the *Time* magazine article *Canadians Who Define the New Frontiers of Science.*

Jie Chen, P.Eng., took a risk when he left an Ivy League posting at Brown University for a position at the University of Alberta. A university news story reports he was looking for a fresh start in a more multi-disciplinary environment. He found what he was looking for, and the resulting collaboration led to research that is considered one of Canada's top medical breakthroughs. He was also awarded the prestigious Killam Annual Professorship.

Dr. Chen received a B.Sc. in electrical engineering from Fudan University in China, before moving to the United States to complete a master's and PhD in electrical and computer engineering.

From the moment Dr. Chen arrived at the U of A he was exposed to opportunities for interdisciplinary collaboration. Interested in the biomedical field, he met a dentist who was exploring the use of ultrasound to stimulate the growth of dental tissue. The dentist needed a smaller, less

bulky device, and asked Dr. Chen if he could design something. This started a cross-campus collaboration in Low Intensity Pulsed Ultrasound (LIPUS), which was recognized in 2006 by *Reader's Digest* as one of Canada's top medical breakthroughs. His U of A biotech company is focused on the dental ultrasound device and the product is currently in phase two of clinical trials.

Dr. Chen is currently developing a non-invasive, hand-held biosensor with touchscreen. Similar to the tricorder of Star Trek fame, the device will conduct medical tests to diagnose, monitor, and predict health conditions in a matter of minutes. The device can identify more than 50 common diseases and predict a person's future health changes.

Despite his exciting research and biomedical developments, Dr. Chen considers himself an educator first. A professor in the U of A Faculty of Engineering's Department of Electrical and Computer Engineering and an adjunct professor in its Department of Biomedical Engineering, his passion for the subject matter is evident. He receives consistently high scores in student evaluations, and many students seek him out because of his reputation for clearly explaining complex subject matter. Dr. Chen sees this as mutually beneficial, as stronger students are invited to join his lab and help advance his research.

Dr. Chen has contributed to 85 journal articles and holds seven patents. He is a research officer at the National Institute for Nanotechnology at the U of A.

SILVER CERTIFICATION FOR PERMIT HOLDER

APEGA Permit Holder **Roche Ltd., Consulting Group** is the first Canadian engineering firm to achieve silver in the Progressive Aboriginal Relations (PAR) certification recognition program. The company was granted the certification by the Canadian Council for Aboriginal Business in September.

It acknowledges Roche's efforts to develop sustainable and innovative partnerships with Aboriginal communities in Quebec. President and CEO Alex Brisson says the company's goal is "to generate a positive impact in the communities — and also contribute to the greater welfare and development of the people who live there."

Roche has a dedicated team that specializes in community relations and encourages the hiring of Aboriginal employees. In 2015 it instituted its Aboriginal Relations and Partnerships Policy, to further cement the company's commitment to Aboriginal community development.

The PAR certification includes independent assessments of Aboriginal relations in four key areas: employment, business development, community investment, and community engagement.

NATHANIEL RUTTER, P.GEOL. . .
. . . international medal man

WHO'S MOVING WHERE

AES Engineering has announced that **Sunny Ghataurah, P.Eng.**, is the Managing Director of a new office that opened in Calgary on November 1. AES Engineering is one of B.C.'s leading electrical engineering providers and Mr. Ghataurah will be dividing his time between the company's Calgary, Victoria, and Vancouver offices.

Manas Shome, P.Eng., has been appointed Principal Water Resources Engineer at **Matrix Solutions Inc.** Dr. Shome has more than 25 years of experience in hydrology and hydraulic engineering research and frequently serves as an expert witness at regulatory hearings.

Erwin Sison, P.Eng., and **Albert Lee, P.Eng.**, have co-founded a new company. Seagora is an online marketplace for selling or buying surplus oilfield equipment. It matches buyers and sellers of inventory in Alberta.

This And That

For most professionals, retirement is both an ending and a new beginning. In fact, they often rediscover skills and talents they never had time to explore during their professional careers. That's certainly the case for retired APEGA **Life Member Wayne Elsner, P.Geol.**, who continues to try new things and encourages others to find ways to keep busy and contribute to society.

Mr. Elsner spent 30 years as a geologist in industry before retiring in 2007. After putting considerable thought into what he would do next, he decided he needed to find a constructive way to spend his time.

For Mr. Elsner, that meant writing a novel. He gave himself a timeline of five years to finish it. Now eight years later, he has completed not just one but 13 books, publishing two of them in a series titled the *Tannion Series*.

Described as urban fantasy action adventure, the books follow a protagonist who gains superhuman powers. It has consistently high ratings from readers, who are anxiously awaiting the third installment.

In addition to his writing, Mr. Elsner and his wife love to travel and have now visited more than 88 countries.

Building a Road?

With eight different Biaxial Geogrids, four Triaxial Geogrids, and multiple woven and nonwoven geotextiles, we can save you money, aggregate, time & carbon emissions on any trafficked structure construction project.

Let Nilex help you make a Smart Choice.

Biaxial Geogrid • TriAx® • Geotextile

Smart. Choice.

nilex.com | 800.667.4811

NILEX
CIVIL ENVIRONMENTAL GROUP

Congratulations

To Our 2015 Engineering Fellows

APEGA and Engineers Canada congratulate the 2015 recipients of the Engineers Canada Fellowship. APEGA Members awarded fellowships were honoured in recognition events in October in Edmonton and Calgary.

This program recognizes Professional Engineers and non-engineers who have made outstanding contributions to the engineering profession through their professional accomplishments.

Listed here are the names of the APEGA inductees. We gratefully acknowledges the time and effort they have given to the profession.

Mr. Allen Adams, P.Eng., FEC
Ms. Colette Bielech, P.Eng., FEC
Mr. Terry Brooker, P.Eng., FEC
Dr. David Evans, P.Geol., PhD, FGC, FEC (Hon.)
Dr. Ivan Fair, P.Eng., PhD, FEC, FGC (Hon.)
Mr. Leo Flaman, P.Eng., FEC
Mr. Frank George, P.Eng., FEC
Ms. Wanda Goulden, P.Eng., P.Geo. , FEC
Mr. Melvin Hess, P.Eng., FEC
Mr. John Hewitt, P.Eng., FEC
Dr. Steve Hrudey, P.Eng., PhD, FEC
Mr. Barry Laviolette, P.Eng., FEC
Mr. Bernd Manz, P.Eng., FEC
Mr. Keith McCandlish, P.Geo., FEC (Hon.)
Mr. Sadiq Pirani, P.Eng., FEC
Mr. Kevin Saretsky, P.Eng., FEC
Mr. Jeff Simms, P.Eng., FEC
Ms. Terri Steeves, P.Eng., FEC
Mr. Bruce Thorne, FEC

To Our 2015 Geoscience Fellows

APEGA and Geoscientists Canada are proud to congratulate the 2015 recipients of the Geoscientists Canada Fellowship. Honourees were invited to recognition events in October in Edmonton and Calgary.

The fellowships honour individuals who have given noteworthy service to the geoscience profession, through service to Geoscientists Canada, service to one of the constituent associations of Geoscientists Canada, or service in another capacity. The expertise and dedication of these professionals is a reflection of the thriving geoscience community in Canada and is a credit to their profession.

Ms. Mary Cowling, P.Eng., FEC, FGC (Hon.)
Dr. David Evans, P.Geol., PhD, FGC, FEC (Hon.)
Dr. Ivan Fair, P.Eng., PhD, FEC, FGC (Hon.)
Mr. Frank George, P.Eng., FEC, FGC (Hon.)
Ms. Wanda Goulden, P.Geo., P.Eng., FEC, FGC
Mr. Melvin Hess, P.Eng., FEC, FGC (Hon.)
Mr. John Hewitt, P.Eng., FEC, FGC (Hon.)
Mr. Barry Laviolette, P.Eng., FEC, FGC (Hon.)
Mr. Bernd Manz, P.Eng., FEC, FGC (Hon.)
Mr. Keith McCandlish, P.Geo., FGC , FEC (Hon.)
Mr. John Ogilvy, P.Eng., FGC (Hon.)
Mr. Kevin Saretsky, P.Eng., FEC, FGC (Hon.)

engineerscanada

APEGA The Association of Professional Engineers and Geoscientists of Alberta

GEOSCIENTISTS GÉOSCIENTIFIQUES CANADA

Continuing the Conversation

APEGA is exploring proposed changes to our governing legislation, and we need Member input. Consultations over the past year have already gathered feedback from thousands of stakeholders — and the process continues into 2016. If you want to have a say in how the engineering and geoscience professions are governed in Alberta, there's still time to bring your perspective to the table

The past year was a pivotal one for APEGA's legislative review process. Much happened in a short period of time, but we're pleased to report that we've made tangible progress on this strategic priority to review and reimagine the *Engineering and Geoscience Professions Act (EGP Act).*

Below is an update on what we've accomplished and what lies ahead in 2016.

COUNCIL ENDORSES RECOMMENDATIONS — WITH A FEW CHANGES

At a special meeting on October 6, APEGA Council endorsed all six proposed recommendations in the *We're Listening: Spring 2015 Consultation Summary*. This report, available online at apegalegislativereview.ca, includes full details on the six recommendations, as well as the feedback gathered from Members during our spring consultations. Topics reviewed last spring relate to Member-in-Training, Licensee, Professional Licensee, and Student membership categories, as well as issues surrounding the Registrar and statutory boards' authority to delegate and Alberta Building Code exemptions.

In response to feedback represented in the report, Council's endorsement included some clarifications to three of the six proposed recommendations. Council decided:

- to place a limit on the number of Members-in-Training (M.I.T.s) who can run for Council (to be determined by the Nominating Committee) and a limit on the number of M.I.T. positions on Council
- to create a new Limited Licence designation that includes the word Professional
- to remove the requirement for a Professional Member to be a Canadian citizen or have permanent residence status. However, a Professional Member must be a Canadian citizen or have permanent residence status to run for Council

FALL CONSULATIONS FEATURE REVIEW OF 15 MORE TOPICS

During fall consultations in October and November, discussions centered on proposed improvements to regulatory efficiencies. Represented in the 15 topics examined, among other changes, were:

- proposed increases to disciplinary and other fines
- how best to inform the public about disciplined Members and Permit Holders
- how best to inform the public about unlicensed individuals and companies without Permits to Practice practising or suggesting that they practise
- changes to APEGA's investigative process
- changes in APEGA's registration appeals process
- changes in the Registrar's authority

Feedback was collected until mid-December and the information gathered will be compiled into another report for Council's consideration. In February, we'll share Council's decisions on the information.

COMMITTED TO CHANGE

To date, over 2,200 Members and Permit Holders have provided feedback on the proposed recommendations, through dozens of consultations and meetings, and online feedback.

At the centre of the legislative review are the concentrated efforts of Members, Permit Holders, APEGA's senior leaders, and APEGA's Council, working together to address more than 180 proposed legislative changes.

By the end of March, we'll have processed about 160 of these proposed changes. This includes 47 that were dropped because they were duplicated or were administrative in nature and addressed elsewhere.

2016 AND BEYOND

There are three phases to the legislative review. The first phase, now underway, is a review of the *EGP Act* itself. This phase of the review will continue into 2016, with the next round of consultations beginning at the end of February and concluding in March. Discussion topics for this round will be confirmed by Council in February.

After that, we'll start reviewing the Act's General Regulations, and then the Bylaws. Proposed changes in these areas will be brought forward at AGMs in 2017 and 2019 respectively.

Any proposed recommendations that have been endorsed will go forward to the Government of Alberta for its consideration.

SIDEBAR

DID YOU KNOW?

The Engineering and Geoscience Professions Act (EGP Act) governs APEGA professionals and their practices — but the legislation actually belongs to the Government of Alberta. The province has encouraged APEGA to update the *EGP Act* and bring forward proposed recommendations.

STAY INFORMED, PROVIDE INPUT

- Review proposed recommendations by watching information videos or reading discussion briefs at apegalegislativereview.ca.
- Attend or participate in APEGA Branch or Permit Holder events and webinars, or meet with champions collaborative Members face-to-face. (The collaborative is a group of engineering and geoscience professionals who are engaging Members and Permits Holders in the legislative renewal process.) Watch for more information about these events in your electronic Branch News, the e-PEG, and the e-PEG Extra.
- Send comments or questions to legislative-review@apega.ca.
- Take the online survey. The next survey will be on the website in late February.

WHY YOU SHOULD TAKE PART

The *EGP Act* directly affects the practices of Professional Engineers and Professional Geoscientists in Alberta, defining your responsibilities and obligations as a professional. That's why it's important for APEGA Members to take part in the legislative review consultations now underway.

This is your opportunity to share your insights and opinions on important topics that will help modernize the Act, which hasn't had a major update in more than 30 years. Renewal will ensure that the provincial legislation continues to reflect modern business practices and will allow APEGA — and our Members and Permit Holders — to better protect the public interest.

Consultations and surveys held over the past year have gathered thoughtful feedback from Members, Permit Holders, and other stakeholders. We want to thank everyone who's been part of the discussions, encourage them to continue — and encourage those who haven't participated yet to get involved now.

The process will continue for several more years so there's still plenty of time. Your ideas will inform and influence our recommendations to the provincial government on any proposed amendments.

The Legislative Review in Your Words

We asked APEGA professionals why they attended fall legislative review consultations. Here's what they had to say.

"In the session I attended, I learned that APEGA is bringing forward a number of changes to the legislation that will strengthen the investigative process, which I was happy to see. I spent almost three years on the investigative committee and, in my opinion, the proposed changes will improve the investigative process so that it is fairer to Members under investigation while still protecting the public interest. I think that APEGA has done a superb job of engaging its Members in the legislative review process."

- **MARLIN SCHMIDT,** *P.GEOL.*
Edmonton Goldbar MLA

"I was practising in the United States and just moved to Alberta. I registered with APEGA this spring and I wanted to learn more about the self-regulatory process and all the changes that are proposed by the legislative review. It's very important to incorporate Members' ideas."

- **SUNIL GYAWALI,** *P.ENG.*
Edmonton

"I started as a Foreign Licensee and do volunteering whenever approached by international graduates, so it's helpful to understand how those arriving from other countries can become APEGA Members. APEGA is a self-governing organization, so it's also important that I give feedback and that every Member understands the responsibility that comes alongside that."

- **IMRAN KHAN,** *P.ENG.*
Calgary

"I'm a Responsible Member for Nexen in Fort McMurray. I want to have a voice in what happens. If Members want legislation in place that is beneficial to the Association, they have to participate. It's like voting. If you don't vote, don't complain."

- **GARY CHEETHAM,** *P.ENG.*
Fort McMurray

"APEGA is our Association. We need to make sure it's heading in the right direction. It's good to listen to others' opinions of the legislative changes, and hopefully that leads to a new set of regulations that work for all of us."

- **BRUCE STEWART,** *P.ENG.*
Beiseker

"It's important for Members to contribute to the legislative review process and give their opinions, as this is related to all of us and affects all of us. I wanted to make sure my voice is heard on the discussion surrounding publishing Member information during an investigation."

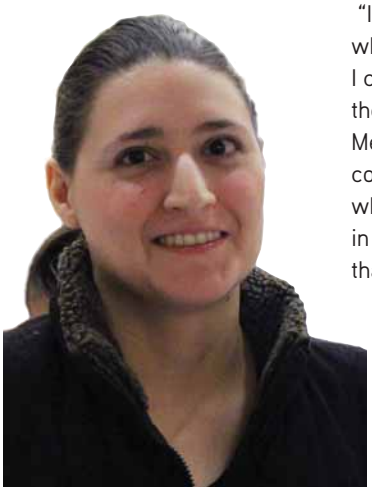
- **AZITA AZARNEJAD,** *P.ENG.*
Calgary

"I want to broaden my knowledge of APEGA and how the Association serves the public interest. The legislative review sessions are very informative and very important. APEGA is a self-regulating system, managed by the Members themselves, so I think it's the Members' responsibility to contribute their knowledge during this review process."

- **VAHID AYAN,** *Provisional Licensee (Eng.), PhD*
Edmonton

"I'm a Responsible Member for WSP Canada. The Act hasn't been changed for 30 years and lots of things need to be updated, so it's important to participate. There have been so many changes in industry. APEGA needs to be able to respond to issues, for example with discipline or enforcement, more promptly or appropriately."

- **GLORIA GERBER,** *P.ENG.*
Edmonton



"It's important to understand what will affect you as a Member. I came specifically to hear about the discussion surrounding Members' privacy. I think communities tend to be healthier when their population is involved in major decisions and legislation that impacts them."

- **MARINA REEVES,** *P.ENG.*
Calgary

"I'm interested to see the proposed changes and the direction APEGA is going in. I would encourage all Members to be a part of the legislative review process because it's their Association and it's their rules for guiding the professions."

- **MIKE NOWLAN,** *P.ENG.*
Chestermere

"I'm part of the legislative review champions collaborative. APEGA is one of the rare organizations that is run by Members. It's for the benefit of Members to be informed of the proposed changes and be engaged in the legislative review process. Every Member has a different experience and therefore brings a different perspective. If a Member has an opinion on the proposed changes, he or she can voice it."

- **ROGHOYEH SALMEH,** *P.ENG., PhD*
Calgary

"As a Permit Holder, this is a very important discussion for my company. We're professionals who maintain a high standard, and it's crucial for those providing professional services in Alberta to adhere to that. APEGA has the privilege of being self-governing and we need to participate in our governance to make sure that it remains at a high standard and is valued in Alberta."

- **CALVIN MCCLARY,** *P.ENG.*
Calgary

APEGA Plans 2016 Introduction of Competency-Based Assessment

The restructuring of this portion of APEGA's licensure process, featuring web-based tools, will make the connection between engineering experience and competency clearer, more efficient, and more consistent

A new competency-based assessment (CBA) tool APEGA is now developing will be rolled out in late 2016, helping clarify and streamline the registration of engineering applicants — especially those from other countries. The CBA approach will enhance how we evaluate the work experience and competency of applicants, making the process more effective and efficient.

Work began on the project early in 2015, and in March the Government of Alberta approved a partnership grant to support its creation and launch.

We're not starting from scratch, though.

The Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) officially adopted a CBA framework in June, after nine years of development and an 18-month pilot. We're using the sister organization's CBA as a model and starting point to build one customized for Alberta.

Geoscientists Canada, meanwhile, is developing a competency profile for Professional Geoscientists. Once it's complete, APEGA will look at adopting the profile. We anticipate rolling out a geoscience CBA system by early 2017.

A CBA system will make it easier for applicants to understand the exact experience qualifications required for licensure and how their skills will be recognized in Alberta. It will also make it less complicated for the APEGA Board of Examiners — which evaluates applications — to determine whether candidates meet those standards.

Competency-based assessment is one part of an overhaul of APEGA's registration system that will continue for the next few years. The process for academic assessments is also being revamped, and a major part of that project is being launched this month.

Starting January 14, Internationally Trained Applicants (ITAs) must contact World Education Services (WES) to obtain an academic credential evaluation report. WES will provide each ITA's report to APEGA and the report will be among the inputs used to assess each individual's academic qualifications. While the APEGA Board of Examiners will continue to evaluate academic qualifications, the additional support provided through the WES report is expected to both expedite the process and improve decision making.

For more information on the academic assessment change, please visit apega.ca

CBA IN DETAIL

CBA is about connecting experience to the actual competencies a Professional Engineer requires. In the B.C. model, applicants propose that they're proficient in seven core competencies, connecting them to their own experience. These are skills that all Professional Engineers — regardless of discipline — must be proficient in to ensure effective and professional practice in the service of the public interest.

Within the seven core competencies in B.C. are 33 required indicators. These are activities, actions, skills, or behaviours that an applicant could use to demonstrate a competency. To a certain level of expertise, applicants must demonstrate that they've attained the competencies and indicators within their experience.

Under the technical competence core category, for example, B.C. applicants provide specific and detailed examples of:

- how they applied an appropriate code or regulation to their work
- why they used it
- what the outcome was

They're also required to self-assess their level of proficiency on a five-point scale for each indicator.

In APEGA's current system, work experience is confirmed by three or more references. Under CBA, each competency listed by an applicant must be reviewed by a validator — someone familiar with the applicant's work. Skills can be confirmed by one or more validators, depending on the applicant's work history. Validators also rate the applicant's level of proficiency on the same five-point scale used by applicants.

The application goes to individual APEGA examiners for an initial review, then to the Board of Examiners itself for a final review and decision.

ENHANCED CLARITY AND UNDERSTANDING

Competency-based assessment makes the experience portion of assessment clearer, more understandable, and more consistent for applicants and the Board of Examiners. The new process will

be especially beneficial for ITAs. Last year, APEGA received over 9,200 applications, and nearly half of the applicants were internationally trained.

With CBA, applicants are given clear direction on specific competencies and the levels needed to obtain a Professional Engineering licence in Alberta. With the current process, applicants are asked to describe at least 48 months of work experience. The Board of Examiners then connects competencies to the experience described.

Asking applicants to make those connections and measure their value up front makes more sense for everyone. The experience part of the board's job is then about agreeing or disagreeing, partially or entirely, and asking for targeted experience when necessary.

Because CBA is a self-assessment tool, applicants will often determine right away that they need to improve particular competencies — before they submit their CBA documentation to APEGA.

Applicants understand early in the process what competencies it takes to be a Professional Engineer. They become partners in the process.

CBA is a fair, objective, and transparent way to measure an applicant's work experience and competencies, especially when experience is obtained outside of Canada. Even if the experience is not typical to Alberta — working in a rubber factory, perhaps — the competencies developed may be well suited to the province.

If the board finds that an applicant lacks competence in a certain area, the new system will make it easy for examiners to outline exactly what competencies need to be built upon while the applicant gains further experience. Applicants and supportive employers can then focus their energy in the right places, sending new information to the board sooner.

WHAT'S NEXT?

An online, competency-based assessment tool and a companion online self-assessment tool are expected to go live by late 2016. Before that, APEGA will consult stakeholders, including the Board of Examiners and applicants, to develop an Alberta core competency framework. A pilot project will be undertaken mid-year to test the tools and the process.

APEGA isn't the only engineering regulator joining APEGBC in adopting CBA. Several other engineering regulators are investigating the system's merits, although APEGA is the furthest along.

CBA will replace APEGA's current work experience review process only. Applicants will still be required to meet academic qualifications and have Canadian citizenship or permanent resident status.

HOW WILL CBA AFFECT EXISTING APPLICATIONS?

When the new system is brought online, individuals with applications in process will have the option to update their documentation using CBA.

More details on all aspects of CBA will be published:

- in future editions of *The PEG*
- online at apega.ca
- online in the Member Self-Service Centre

Job Title Housekeeping

APEGA builds and maintains public trust by striving to ensure that only Members use our titles and designations. Are you and your employer doing your part?

APEGA is reaching out to some of our Permit Holders in 2016 to encourage them to make an extra effort to use our titles and designations correctly. Employees and contractors must be licensed by APEGA if they practise engineering and geoscience in Alberta — or use job titles and designations associated with APEGA licensure.

Anyone who uses P.Eng. or P.Geo. must have met APEGA's academic, professional, and ethical standards, and must be a licensed Member. The same applies to most uses of words like engineer and geoscientist in job titles. Those who use them illegally are subject to action from APEGA and could even end up in court.

Why do we care and why should you care? One of our mandates as the Alberta regulator of engineering and geoscience is to protect the public from the misuse of these reserved titles. Members and Permit Holders share that responsibility.

In 2016 we'll be getting in touch with some of our Permit Holders directly through their Responsible Members and their human resources departments. Responsible Members are professionals who make sure that their company adheres to the *Engineering and Geoscience Professions Act (EPG Act), Regulations and Bylaws*. Human resources departments also need to know the rules, because they are involved in hiring and often develop or assign job titles.

QUESTIONS WORTH ASKING

You can do some job title housekeeping right now.

To help ensure your company complies with right-to-title provisions in the *EGP Act*, you and your human resources department should be answering yes to the following questions:

- Do your engineering or geoscience job postings specify that individuals must be licensed by APEGA or be eligible for an APEGA licence?
- Are job applicants who say they're engineers or geoscientists actually licensed by APEGA? Check names in the Member Directory at apega.ca
- Are employees who don't practise engineering or geoscience using titles that comply with the *EGP Act?*
- Do only employees licensed with APEGA have terms like engineer or geologist in their job titles? Check names in the Member Directory at apega.ca
- Are only employees licensed with APEGA using reserved designations like P.Eng., P.Geo., E.I.T., and G.I.T.? Check names in the Member Directory at apega.ca
- Are your Members-in-Training (M.I.T.s) — that is, Engineers-in-Training (E.I.T.s) and Geoscientists-in-Training (G.I.T.s) — working under the supervision of Professional Members of APEGA?

SIDEBAR

PROTECT THE PROFESSIONS

Help protect our professions. Do you know of a person or organization practising engineering or geoscience in Alberta without an APEGA licence or permit? Do you know of unlicensed persons or organizations using reserved titles or designations, or otherwise advertising or suggesting they're licensed to practise? Please let us know.

Complaints can be anonymous, and they're confidential.

If the individual isn't licensed, let us know by emailing compliance@apega.ca or by calling 1-800-661-7020 and asking for the Compliance Department.

You can be an active compliance advocate in several ways:

- Stay informed of the importance and roles of APEGA licences, permits, titles, and designations
- Report reserved title or practice violations to compliance@apega.ca or by calling 1-800-661-7020 and asking for the Compliance Department
- Pass on the information published here to fellow Members and the public

- When you hire contractors or subcontractors to practise engineering or geoscience, do the companies have Permits to Practice and are the individuals Professional Members? Find out by checking our Member Directory and our Permit Directory, before selecting a contractor

TITLING TIPS

Companies should also keep the following in mind, when it comes to the use of reserved titles:

- Members-in-Training can use reserved titles like engineer or geoscientist, but they have to clarify with the use of the words in training or an in-training designation. For example, Maria Garcia, Civil Engineer-in-Training, or Maria Garcia, E.I.T., can both be used in conjunction with a job title that uses the word engineer
- Some APEGA Member categories do not have the right to use an APEGA title, such as Applicants, Students, ASAP student members, and exam candidates. These individuals are not fully licensed by APEGA and should use alternative words to engineer and geoscience in their titles, like technician, manager, or data reporter
- APEGA looks at the use of reserved titles in context to decide whether licensure to practise is implied. If you are uncertain of a title or an alternative, contact compliance@apega.ca for clarification

STATISTICALLY SPEAKING

Collectively, cases involving reserved right to title and practising without a licence are known as compliance cases. As of early November this year, APEGA's Compliance Department had opened 284 right-to-title cases in 2015.

THE COMPLAINT PROCESS

- When APEGA's Compliance Department becomes aware of a potential infraction, it opens a case and the individual or company is contacted.
- The individual or company is informed of the infraction, told how to become compliant, and given time to comply. These duties are performed by APEGA staff and APEGA legal counsel.
- If an infraction persists, the case may go before the Enforcement Review Committee, which consists of APEGA volunteers with experience in various industries and disciplines. This committee of Members gives staff consent to apply for an injunction in the Court of the Queen's Bench.

Of those, 129 resulted from tips from Members not employed by the Association and the public. The others came from searches of directories, websites, and other records by APEGA staff or tips from staff. Nearly half of all cases were related to the misuse of a reserved title or designation.

After working with individuals and companies, we've been able to close 263 cases. Most of the time, the individual or company complied voluntarily. In some cases, however, we've had to take legal action. This involves seeking a Court Order through injunction from Alberta's Court of Queen's Bench to compel an individual or company to comply.

Connecting with Permit Holders is just one part of APEGA's ongoing efforts to create awareness about the appropriate use of reserved titles.

IMPOSSIBLE TIMELINES. COMPLEX SITE. DIFFICULT SOIL CONDITIONS.

Count us in.

Foundation Piling ◆ Excavation Support ◆ Ground Improvement

Keller thrives on challenges and excels where others struggle. Backed by the largest and most comprehensive independent ground engineering specialist in the world, and with over 30 years of local on-site experience, Keller Canada provides the largest variety of piling and geotechnical solutions in the country.

Engage us early to experience the true benefits of value engineering. Lower your total install cost today. Visit KellerCanada.com or call 780-960-6700 – Formerly North American Caisson Ltd.

KELLER Canada

THINK SAFE

BE AMONG EXCELLENCE
BE AT THE SUMMIT

The nominations for Summit Awards are in! Now it's time to celebrate the exceptional achievements of the recipients at our prestigious event. Mingle with the leaders, innovators, and the up-and-comers of our professions during the Summit Awards Gala reception and dinner.*

2016 SUMMIT AWARDS IN EDMONTON

Shaw Conference Centre
April 21 at 5 p.m.

For details and pricing, go to apegasummit.ca
or call 780-426-3990 or 1-800-661-7020.

* The Summit Awards Gala is part of APEGA's Annual General Meeting and Conference

APEGA

APEGA SUMMIT 2016

ANNUAL
GENERAL MEETING & CONFERENCE

APEGA Summit 2016 Annual General Meeting and Conference takes place at the Shaw Conference Centre in Edmonton from April 21 to 22, 2016. The Annual General Meeting and Conference brings Members, Permit Holders, government representatives, and other professionals together for two days of professional development, collaboration, and celebration.

SPONSORSHIP OPPORTUNITIES

Show your commitment to excellence by participating as an active partner in the APEGA Summit.

When you sponsor this event, you will have the opportunity to gain recognition and reinforce your organization's image within the professional engineering and geoscience communities.

APEGA has a variety of sponsorship levels to meet your needs.

For more information, contact Shirley Layne, CMP, Event Planning & Member Recognition Manager, at 780-426-3990 or 1-800-661-7020.

Sponsorship commitment deadline: February 19, 2016

PROFESSIONAL DEVELOPMENT

APRIL 21 AND 22, 2016
SHAW CONFERENCE CENTRE

Thursday, April 21: 8:30 a.m. – 4:30 p.m.
Friday, April 22: 8:30 a.m. – 11:45 a.m.

Earn up to 10 PDHs under the CPD Program

Managing resources wisely, staying current with trends in our professions, and meeting regulatory requirements are critical tasks for professionals like you. Engaging, educational sessions at Summit 2016 will support you in meeting your continuing professional development requirements.

SUMMIT AWARDS GALA

APRIL 21, 2016
SHAW CONFERENCE CENTRE

Reception, Awards Presentation, and Dinner: 5:00 p.m. – 9:00 p.m.

The annual Summit Awards Gala is APEGA's pre-eminent event of our professions. The APEGA Summit Awards recognize excellence in professional engineering and geoscience as well as the valuable contributions APEGA Members make to their communities. For more information, including a full list of awards, visit **apegasummit.ca**.

ANNUAL GENERAL MEETING AND LUNCHEON

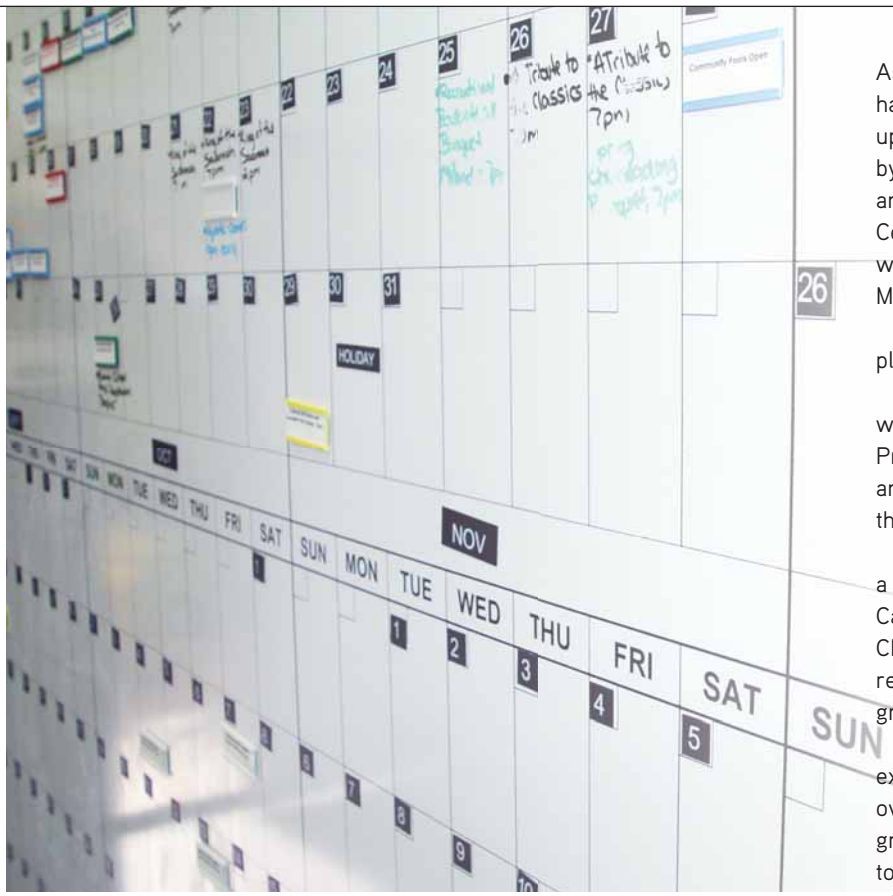
APRIL 22, 2016
SHAW CONFERENCE CENTRE

Luncheon: 11:30 a.m. – 1:40 p.m.
Annual General Meeting: 2:00 p.m. – 5:00 p.m.

Open to all Members and the public, the Annual General Meeting is your opportunity to discuss issues important to the professions, vote on matters brought before Council, and present motions for Council consideration.

Start Populating Your 2016 Professional Development Calendar — **Now**

APEGA's professional development offerings help Members build their careers, meet their continuing education needs — and meet their mandatory Continuing Professional Development (CPD) program requirements. Our newly revamped schedule starts in February, delivering value-added programming and tangible learning outcomes you can apply directly to your work



As an engineering or geoscience professional, you have a responsibility to serve the public interest and uphold public safety. One of the ways you do that is by maintaining, improving, and expanding your skills and knowledge. That's the core reason for APEGA's Continuing Professional Development (CPD) program, which mandates career-long learning for Professional Members.

With the new year starting, now is a great time to plan your 2016 professional development calendar.

A good place to start your search is APEGA's website. We offer a wide range of sessions to help Professional Engineers, Professional Geoscientists, and Licensees engage in continued learning and meet their CPD requirements.

But what if you're a Member-in-Training (M.I.T.), a Student, an ASAP student member, or an Exam Candidate, and therefore are not required to meet our CPD requirements? Good news — you're welcome to register for our PD sessions and take advantage of this great way to build new skills and advance your career.

As part of APEGA's efforts to enrich the Member experience, we've been revamping our PD offerings over the past year to deliver more value-added programming. We know that Members and employers want to invest their time and money on PD sessions that offer applied learning.

ENSURING TOPICS ARE RELEVANT

With that in mind, we've put together a PD schedule that delivers a diverse selection of engaging presenters and relevant topics. Our goal is to provide high-quality sessions that support your professional learning and growth. You'll leave each session with practical tools and takeaways that you can apply directly to your work.

Do you want to stay current on the latest technology? Learn best practices for supervisors? Develop financial management skills to advance your career? Our sessions, starting in February, cover these topics and many others.

FURTHER OPTIONS

In addition to our year-round PD schedule, Members can take advantage of a variety of offerings at the APEGA Summit 2016 Annual General Meeting and Conference, April 21 to 22.

See pages 42 and 43 for more information on the conference PD program.

Members can also take part in ongoing PD sessions organized by APEGA Branches across the province. These may include lunch or evening sessions, depending on the Branch. Details are posted regularly at apega.ca and in the e-PEG and Branch News electronic newsletters.

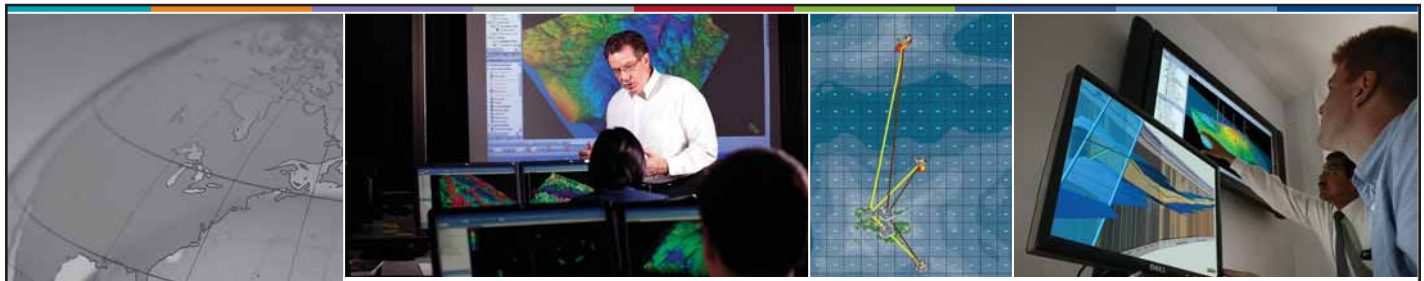
PD IMPROVEMENTS

- Research shows learning is linked to motivation, so we strive to keep our PD sessions engaging. We've introduced a new presenter proposal form to ensure that we offer quality, interactive sessions with active learning, and relevant, practical exercises. Presenters must outline the practical skills and knowledge participants will gain from each session, and what tools or supporting documents will be provided to help participants apply their learning afterwards. Our aim is to offer presenters who are subject-matter experts — and also effective at helping others learn.
- Not sure what PD session is best for you? We've enhanced our session descriptions and presenter biographies, and added session categories and recommended audiences for easier navigation of information. Categories are linked to the session's overall focus — communication skills, interpersonal skills, or technical knowledge, for example.
- We've introduced a new e-evaluation form so Members can provide feedback after their sessions. They can provide recommendations for the presenter and suggest PD categories or topics for future sessions.
- We're giving Members-in-Training more learning opportunities by opening all PD sessions year-round to M.I.T. pricing. In line with learning principles, this allows M.I.T.s to choose the PD they want, when they want it.

Other improvements we're looking at include half-day sessions and webcasts. We know Members are busy people and can't always get away from the office for a full day. Our vision is to make PD options more accessible while keeping them affordable.

A partial schedule of what we're offering appears on page 46 of this *PEG*. Also, please watch for updates in our electronic newsletters — the e-PEG, the e-PEG Extra, and the Branch News.

SEE ALSO: MANDATORY REQUIREMENTS ON PAGE **48** ››



APEGA Professional Development

Applying Cross-cultural Effectiveness at Work
Presenter: Marie Gervais, PhD, CE, CTDP
Calgary — February 17
Edmonton — February 25

Contract Administration & Avoiding Issues in Engineering & Construction Projects (2 days)
Presenter: George Jergeas, P.Eng., PhD
Edmonton — February 23-24
Calgary — March 29-30

Managing Change at the Speed of Life
Presenter: Shairose Lalani, CHRP
Calgary — February 25
Edmonton — March 8

Challenging Conversations Made Easy
Presenter: Maurice Fritze
Edmonton — March 1
Calgary — March 15

Engineering Better Team Member Performance with Coaching
Presenter: Russell Stratton, M.A., MCPID, MCMI
Calgary — March 2
Edmonton — March 17

Requirements for Licensure (Free)
Presenter: Enayat Aminzadah, B.A. (International Qualification Services Manager, APEGA)
Edmonton — March 9
Calgary — March 10

Improving Communication Skills with Neuro-Linguistic Programming
Presenter: Diana Ionescu, P.Eng.
Calgary — March 9
Edmonton — March 15

Strategies to Increase Speaking Success by Reducing Foreign Accents (Limit of 15 participants)
Presenter: Peggy Kayne, B.Sc.
Edmonton — March 22
Calgary — March 31

Finance Essentials for Nonfinancial Managers
Presenter: Frank Saccucci, MBA
Edmonton — March 29
Calgary — April 5

Sessions run 8:30 a.m.-4:30 p.m. unless otherwise stated

APEGA

MORE INFO
Professional Development Program
PD@apega.ca
or
Visit apega.ca/Events/pd.html

LOCATIONS
Edmonton
APEGA
Lindberg Conference Centre
1500 Scotia One
10060 Jasper Ave. NW

Calgary
APEGA
Windsor Conference Centre
2200 Scotia Centre
700 Second St. SW

EDMONTON BRANCH CALENDAR

LUNCHEONS

TUESDAY, FEBRUARY 16
President's Visit & Branch Volunteer Recognition
Connie Parenteau, P.Eng., FEC, FGC (Hon.)

TUESDAY, FEBRUARY 23
Location: Holiday Inn Conference Centre South, Evergreen Ballroom
4485 Gateway Blvd, Edmonton
North West Redwater Refinery Project Presentation
Ian MacGregor, Co-founder and Chairman, NW Refining Inc. and Enhance Energy

THURSDAY, MARCH 3
Location: Holiday Inn
2100 Premier Way, Sherwood Park
Value Added – Processing in the Heartland
Neil Shelly, P.Eng., Executive Director, Alberta's Industrial Heartland Association

---

Luncheons held at *(unless otherwise noted above):* The Westin Hotel, 10135 100th St., Edmonton

Schedule: 11:30 a.m. Registration
12 p.m. Lunch
12:30 p.m. Presentation

Cost: Members — $35 ($40 at door)
Non-members — $40 ($45 at door)
Students — $20

For updates, more information and to register:
www.apega.ca/events/branch-events.html

SPONSORS

CALGARY BRANCH CALENDAR

LUNCHEONS

THURSDAY, JANUARY 28
CALGARY BRANCH AGM & LUNCHEON
The Ten Year Story of the Sturgeon Refinery
Ian MacGregor, Chairman & CEO of NW Refining Inc.

THURSDAY, FEBRUARY 11
President's Visit
Connie Parenteau, P.Eng., FEC, FGC (Hon.)

THURSDAY, MARCH 10
Gas Market Outlook including LNG
Paul Ziff, Executive Vice President of Solomon Associates

Luncheons held at: Fairmont Palliser Hotel, 133 Ninth Ave. SW

Schedule: 11:15 a.m. Registration
11:45 a.m. Lunch

Cost: Members & Guests — $50
Students — $25
ASAP (APEGA Student Advantage Program) — $15

To register: **www.apega.ca/events/branch-events.html**
Or phone the Calgary APEGA Office at 403-262-7714, toll free 1-888-262-3688, noting dietary restrictions.

SPONSORS

APEGA Continuing Professional Development:
What You Need to Know to Meet Mandatory Requirements

Professional Members of APEGA must take part in APEGA's Continuing Professional Development (CPD) program and keep a record of their progress. Professional Engineers, Professional Geoscientists, Licensees, and Professional Licensees — all are subject to CPD program requirements

We take CPD seriously and Members should as well. If APEGA's Practice Review Board is not satisfied with your CPD efforts, regulations of the *Engineering and Geoscience Professions Act (the EGP Act)* allow APEGA to review your practice. If we send you a notice to produce a detailed annual activity record and you don't comply within 30 days, your name may be struck from the Member register. And at any time during a review, the Practice Review Board may recommend that APEGA's Investigative Committee also review your practice — which could ultimately lead to disciplinary action.

A successful CPD plan should consider your:

- scope of practice and duties
- current level of knowledge and skills
- short-term needs and objectives
- long-range plans

You should have a clear purpose aimed at some combination of maintaining, improving, and expanding your skills and knowledge.

To meet CPD requirements, you must:

1. complete at least 240 Professional Development Hours (PDHs) over three years
2. maintain a written record of CPD activities. An activity record spreadsheet, available at apega.ca, can help you keep track. You may be required to submit your activity record on request
3. report your CPD hours annually. You can report your hours online using the Member Self-Service Centre. You need to provide the number of PDHs you've accumulated over the 12 months prior to your annual membership renewal date

Six categories of professional development can earn you credits. You must include activities in a least three of them.

- **Professional Practice.** 15 hours of engineering or geoscience work equals one PDH. A maximum of 50 PDHs per year may be claimed in this category.
- **Formal Activity.** Includes professional development programs, courses, and seminars; courses offered by universities, technical institutes, colleges, suppliers, employers, or technical societies; and courses offered in traditional classroom settings, by correspondence or video, or online. One hour of course attendance equals one PDH. One Continuing Education Unit (CEU), for courses offering them, equals 10 PDHs. A maximum of 30 PDHs per year may be claimed in this category.
- **Informal Activity.** Includes self-directed study; attendance at conferences and industry trade shows; attendance at seminars, technical presentations, talks, and workshops; attendance at meetings of technical, professional, or managerial associations or societies; and structured discussions of technical or professional issues with peers. One hour of informal activity equals one PDH. A maximum of 30 PDHs per year may be claimed in this category.
- **Participation.** Includes mentoring a Member-in-Training, a less experienced Professional Member, or a technologist; service on public bodies that draw on professional expertise; service on standing or ad-hoc committees of a technical or professional nature, or on managerial associations and societies; and activities that contribute to the community. One hour of

participation activity equals one PDH. A maximum of 20 PDHs per year may be claimed in this category, with no more than 10 of them coming from community service.

- **Presentations.** Eligible presentations are those of a technical or professional nature that are beyond normal job functions. Presentations might occur at a conference, meeting, course, workshop, or seminar, either within a company or at an event sponsored by a technical or professional organization. Multiple deliveries of the same presentation count as only one presentation. One hour of preparation and delivery earns one PDH. A maximum of 20 PDHs per year may be claimed in this category.
- **Contributions to Knowledge.** Includes activities which expand or develop the technical knowledge base in engineering, geology, or geophysics. Some examples are committee work, patent registration, publication in a peer-reviewed technical journal, or publication of a book. A maximum of 30 PDHs per year may be claimed in this category, although there are also limits for each activity.

EXEMPTIONS

1. If you are unemployed, on extended parental leave, or in a full-time educational program, you can file a non-practising declaration and be exempted from the CPD program. Or if you wish to retain your right to practice while unemployed, on leave, or at school, you can submit a written request to the APEGA Practice Review Board to have your annual PDHs reduced to 30 (which can be claimed in any of the six categories). If you're not sure which option is best for you, contact cpd@apega.ca and we can explain the benefits of each.
2. If your work doesn't fall within the legal definitions of engineering or geoscience and if you do not have technical influence over the professions, you can maintain your registration and be exempted from the requirements of the CPD program by submitting a non-practising declaration. If your work does fall within those definitions or if you have technical influence, you are considered to be engaged in professional practice and cannot be exempted.
3. If you influence the practice of engineering or geoscience in a broader, non-technical sense, you could file a non-practising declaration and be exempt, or you could retain your practising designation by meeting the program requirements.

For complete details, read the *Continuing Professional Development Program* document at apega.ca.

We welcome inquiries from Members with presenter experience who want to share their knowledge at a workshop. Presenting counts towards your CPD hours. For a presenter proposal form, email PD@apega.ca.

COLLABORATION IN ACTION
APEGA Branch Chairs meet quarterly to collaborate and share information on how to better serve Members. In discussion at the June meeting are (left to right) Lakeland Branch Chair Natasha Pounder, P.Eng., Medicine Hat Branch Chair Said Said Yussuf, P.Eng., Fort McMurray Branch Chair Unokhaso Monofi, P.Eng., (hidden) and Central Alberta Branch Chair Sonny Nagra, P.Eng.
-photo by Corinne Lutter

How Branch Renewal is Strengthening APEGA

APEGA decided several years ago to make Branch renewal a business priority. The plan is paying dividends, as the Association relies more and more on developing its grassroots and incorporating ideas from around the province. As the new year begins, plans are in place to build on improvements — and enrich the Member experience through widespread engagement

BY **CORINNE LUTTER**
Member & Internal Communications Coordinator

Ten years ago Jim McCuaig, P.Eng., decided to get more engaged with his profession by volunteering as a Member-at-Large with APEGA's Peace Region Branch. Over the next decade, he and his career moved around the province, and that commitment has followed him. In Lloydminster he volunteered with the Vermillion River Branch Executive, and today he's active with the Edmonton Branch Executive as the Vice-Chair.

"What's kept me involved is the interaction with other professionals and the opportunity to help further my profession. I also found it really rewarding to take part in APEGA outreach programs and get young people interested in engineering and science," he explains.

Aldous Walters, P.Eng., has been on the executive of the Fort McMurray Branch continuously since 2006. He's held almost all positions and is currently the Past-Chair. He got involved to meet other professionals and stay current on industry happenings.

"The practices of engineering and geoscience are changing, not only in Alberta but in Canada. We're not just competing against ourselves; we're competing against the world," he says. "It's important that professionals be involved to really understand the issues — not only to know what's going on, but to give back and help support the professions."

WHY BRANCHES?

Branches serve Members. But do they also serve the overall regulator and service goals of APEGA?

Yes.

APEGA's 10 Branches — and the volunteers who run them — are integral to our operations. Serving urban and rural communities across the province, they're vital links with our offices in Edmonton and Calgary.

As voices of their Members, Branches provide feedback to APEGA Council and staff on issues important to Professional Engineers and Professional Geoscientists. They also act as voices of APEGA itself, communicating important Association information to our membership.

Branches organize professional development sessions and hold networking events. They represent us in their communities, helping APEGA deliver outreach programs like science olympics and elementary science nights.

That's why improving Branch engagement — and through Branches reaching and hearing from more Members — has been an APEGA business priority over the past few years. It's a key part of our ongoing efforts

to renew and refocus our delivery of services and information to Members.

Branches allow us to reach Members across the province, where they live. They provide the reach that we need and that Members expect. When Branches and Members are engaged, our professions are stronger, making APEGA a stronger and more representative self-regulator.

"To maintain our ability to self-regulate, we need an engaged membership," notes Mr. McCuaig. "The self in self-regulating is much greater than the APEGA head office — it is the membership."

SUCCESS STORIES SO FAR

Several initiatives are moving the renewal process forward. We've been clarifying the roles of Branches, and ensuring that their direction and focus reflect APEGA's business and strategic plans.

First up was updating APEGA's Branch Manual. This document outlines the responsibilities of the Branch Executives. It includes:

- policies, procedures, and guidelines for conducting Branch business
- a timeline for key activities that must be performed during the year
- details on reporting finances

Since Branch Executives change each year, the manual serves as a foundational document, providing continuity and the standardization of Branch operations, and ensuring consistency across all Branches.

"With volunteer turnover, that knowledge is sometimes lost," says Mr. Walters. "People may not know what their role is and what's expected of them."

With this in mind, Branch Chairs have worked closely with APEGA staff to develop job descriptions outlining the responsibilities of executive positions, such as Chair, Past-Chair, Secretary, Treasurer, Vice-Chair, and Member-at-Large.

The new and improved manual was adopted in April, just before APEGA's Summit 2015 Annual General Meeting and Conference. It was put to use right away at the annual Branch orientation session, held following the AGM. The orientation puts Branch volunteers from around the province in the same room for an overview of Branch roles and an explanation of how Branch Members fit into the larger APEGA picture.

With engagement in mind, the orientation format and delivery were overhauled to make the event more interactive. In 2015, a mix of new and seasoned volunteers attended, and the focus was:

- collaboration
- networking
- sharing best practices
- learning how branches fit within the APEGA framework

This allowed Branches and APEGA staff to understand and agree upon where efforts and attention belong.

"It was a good forum to discuss how the Branches are working and how we can do better," says Mr. McCuaig. "We're capitalizing now on a lot of corporate history, not just within the individual Branches but within the Branches collectively. That has been a boon to re-engaging our membership."

Mr. McCuaig found it particularly valuable to learn how different Branches are engaging their Members and what supports are available. For example, APEGA has two staff members available — a branch coordinator for the north and one for the south — to help Branch volunteers deliver programs.

Branch Chair meetings are held quarterly, providing valuable face-to-face time for Chairs, Branch coordinators, and the Director, Member Services, to discuss issues. Again, the main focus is information sharing and collaboration about serving Members.

LEGISLATIVE REVIEW

Engaging Branch Executives in APEGA's strategic business priorities, like the legislative review that's now underway, has also been an essential part of the Branch renewal process over the past year. APEGA recruited Branch Executive Members to be part of the champions collaborative, a group of APEGA professionals gathering input from APEGA Members and Permit Holders on key issues surrounding the legislative review. The champions recognize the importance of the review and have been discussing it with stakeholders.

CONTINUED ON PAGE **54** ››

A STRATEGIC PRIORITY

An APEGA strategic priority in our 2015 Business Plan was Branch renewal. Several goals were targeted and most have already been met or are in progress.

Develop a renewed Branch manual that is actively being used	✓
Improve Branch engagement	Ongoing
Standardizing roles and responsibilities of Branch positions across all Branches	✓
Ensure transparency of Branch finances	✓

GeoConvention 2016

GeoConvention
Calgary • Canada • March 7-11 2016
OPTIMIZING RESOURCES

With low commodity prices and an ever - changing economic and business environment, it is imperative that the industry optimize the way in which it operates. Whether enhancing recovery methods, finding the optimal path for a horizontal well or maximizing the return of capital employed, Optimizing Resources, the theme for GeoConvention 2016, is key to success.

Please join us and contribute as speaker, exhibitor or sponsor.

MARK YOUR CALENDAR
GeoConvention 2016 is March 7 – 11

In recognizing the business environment which we are operating in, **GeoConvention is pleased to offer heavily discounted delegate rates for the 2016 program**.

New for our 2016 program, in addition to the technical program and exhibit floor at the Convention Centre, **we will be hosting an offsite component at the Lake Louise Inn** – check out geoconvention.com for details.

EARLY BIRD REGISTRATION NOW OPEN

www.geoconvention.com

Unique Volunteer Opportunity

ESfS earth science for society

Are you interested in learning more about Earth Sciences? Do you want to meet fellow Earth Science enthusiasts or build your network of Professional Geoscientists and others within the Earth Science community? If so, please consider this opportunity!

Earth Science for Society (ESfS) seeks volunteers during its exhibition
March 13 - 15, 2016 - Big Four Building - Stampede Park - Calgary

More than 1,500 students, teachers and adult chaperones will attend on Monday, March 14th and Tuesday, March 15th. ESfS requires volunteers to:

Assemble student packages	Saturday, March 12
Assist with exhibit setup and tear down	Saturday, March 12 and Tuesday, March 15
Assist at specific booths	Sunday, March 13 - Tuesday, March 15
Assist the public and guide youth groups	Sunday, March 13
Guide junior high school groups	Monday, March 14 and Tuesday, March 15

*Note: Our biggest need for volunteers is on Monday and Tuesday, to guide students and teachers. A typical shift is four hours on site, but if you have the time multiple shifts are appreciated. Volunteers must be 18 or older unless accompanied by an adult.

For more information on volunteering please contact ESfSvolunteers@gmail.com

Updates? Find us on Facebook, Twitter, Linked In and at esfscanada.com

Hosted By:

Canada's Energy Geoscientists — cspg.org

CSEG Foundation

CONTINUED FROM PAGE 51 ››

MEETING LOCAL NEEDS

Branches have been working hard to streamline their events to better meet the needs of Members.

"We need to engage with our membership to find out what services they're really interested in. Are they interested in PD sessions at lunch, or does it work better for them in the evening?" asks Mr. McCuaig. Surveys are being used to find out what works best for Members in the various communities.

Each Branch has different needs, wants, and capabilities, so the offerings vary by location. Calgary and Edmonton, for example, have big membership bases and hold monthly luncheons in their downtown cores, close to the workplaces of many Members. Other branches have fewer Members, and often Members and their communities are spread out over large areas.

"That's a big challenge, reaching those Members who aren't located in the community where you're holding events," says Samantha Oler, P.Eng., who's served as Lethbridge Branch Secretary for the past several years. "Lethbridge Branch includes communities like Crowsnest Pass and Taber, which are up to an hour away, so we've been exploring new ways to reach out to those Members."

The Lethbridge Branch just finished planning its 2016 calendar and has expanded its offerings to include four lunch-and-learns and two PD seminars, which is more than double the number of events held this year. "We want to get our Members more involved, so we're looking at doing something every second month," says Ms. Oler.

In Edmonton, notes Mr. McCuaig, the Branch Executive is looking at holding events in outlying communities like Spruce Grove and Sherwood Park and providing a mix of both professional and social events. The Branch is also exploring ways to better engage with female Members, Aboriginals, and Members originating from other countries, by holding events targeted at their interests and needs. Finding ways to increase volunteer participation at the Branch level, especially for science outreach, is also a top priority.

Calgary Branch has expanded its offerings. As well as regular luncheons and seasonal activities like golf tournaments, it has formed a social committee to bring Members together for family events, like a TELUS Spark family night that attracted over 200 guests. "This is another way to allow our Members, from many different industries and age groups, to engage and chat in an informal environment," notes Ramez Hanna Alla, P.Eng., former Calgary Branch Outreach Coordinator.

Of course, Members won't go to events if they don't know about them, so communication is an important focus for APEGA and the Branches.

"Our messaging sometimes isn't getting out there, so people don't know when events are happening. That's something we're working on improving," says Ms. Oler. The Lethbridge Branch has looked at doing mailouts, and developing key contacts within Permit Holders, who would keep their staff informed about Branch activities. The Branches have also worked with APEGA staff to strengthen their messaging in electronic branch newsletters.

Social media is another channel for Branch communication. Several Branches now have Facebook groups to encourage interaction with Members, and more Branches will follow suit.

FUTURE FOCUSED

Over the next year, Branches will continue to build upon the successes of the past year and will be working on several new initiatives, including succession planning.

"Before, the different Branches were going their own way," says Mr. Walters. "Now, we have more direction. We're no longer isolated islands working on our own. People are more involved, and the changes we've made will help the Branches be more successful in our activities."

Ms. Oler, who first volunteered with APEGA five years ago as a recent university grad, encourages Members to get engaged and be part of their professional community. She just transferred jobs from Lethbridge to Calgary, and has already contacted the local Branch to see how she can get involved. And she continues to be involved with APEGA as a legislative review champion.

"It's important for me to know what's going on in the profession, and have a say in how things evolve," she says.

BRANCHING OUT

APEGA's 10 Branches represent the following regions:

- Calgary
- Central Alberta
- Edmonton
- Fort McMurray
- Lakeland
- Lethbridge
- Medicine Hat
- Peace Region
- Vermillion River
- Yellowhead

CALL FOR ACTION

APEGA's Yellowhead Branch hasn't been active for many years. All we need is a few volunteers willing to help restart it. APEGA staff will provide the support you need. The Branch is located to the southwest of Edmonton and is made up of the following communities:

Alder Flats, Blue Ridge, Brule, Buck Creek, Cadomin, Carrot Creek, Carval, Cynthia, Drayton Valley, Edson, Entrance, Entwistle, Evansburg, Fox Creek, Gainsford, Granada, Grande Cache, Green Court, Haddock, Hinton, Jasper, Lodgepole, MacKay, Marlboro, Mayerthorpe, Muskeg River, Niton Junction, Nojack, Northville, Obed, Peers, Pocahontas, Robb, Rochfort Bridge, Rocky Rapids, Sangudo, Violet Grove, Whitecourt, Wildwood.

MORE INFO

HEIDI YANG, *P.ENG., FEC, FGC (HON.)*
APEGA Director, Member Services
hyang@apega.ca

Setting up University Students for Longterm Success

Talk to 1,000 different professionals about their time in post-secondary and you'll hear about 1,000 different experiences. While some look back fondly on their university days, others will remember that graduation couldn't come soon enough. Regardless of the different situations and perspectives each student faces, one theme sure to emerge is uncertainty.

There isn't exactly a "how-to" guide on how to survive — let along thrive — post-graduation, and the economic uncertainty in Alberta right now only reinforces what we already know: a smooth transition between university and a career is far from a guarantee. Many students find the journey from graduation to the workforce a difficult one. Oftentimes, even when they've found work in engineering or geoscience, some will say they were ill-equipped for the challenges they faced in their first year of employment.

Yet for an employer, new perspectives are a source of fresh, exciting ideas, and we routinely hear from Members about the advantages they've experienced bringing new graduates into the organization. With an eagerness and excitement to make an impact, grads can bring new lifeblood into a business, and help it adapt to a changing economic and social environment.

With so much to be gained from helping students better prepare for life after university, APEGA has renewed and refined its University Outreach program, allowing students to make the most of their time as a post-secondary student — while preparing for what lies beyond it.

A CULTURE OF CREATIVITY

APEGA's dedication to providing opportunities for students to strengthen their soft skills and thrive after graduation starts with a planning team that's passionate about improving the lives and careers of those currently in post-secondary. In previous years, APEGA staff would come up with an event idea and then work with a student liaison committee (SLC) to put it into motion.

This method was effective in running quality events, but we realized we were missing an opportunity to harness the creative energy and ingenuity of these students. What if they not only ran the events — but also developed leadership and project management skills? We recognized a latent potential to not only help students manage the transition from post-secondary, but also give them the tools to teach other students and help each other while expanding their own abilities.

That convinced us it was time to restructure each SLC — there is one in Calgary and one in Edmonton — and rethink their responsibilities.

The first step was finding teams of ambitious, creative students who are not afraid to think outside the box. We wanted to make sure the each new Student Liaison Committee consisted of individuals who

- see the value of collaboration and teamwork
- are passionate about improving the lives of students
- bring fresh perspectives to problems

Our group interview process, which involved LEGO, drawings, and mock events, allowed us to observe as leadership styles emerged, problem-solving skills were displayed, and differing opinions were voiced and weighed. There were even a few fist-bumps as teams worked together to accomplish their goals during the interviews.

While unconventional, these interviews sent the same messages we wanted our SLC team to internalize. From kindergarten to university, APEGA's Outreach initiatives are to be memorable, impactful, and fun yet challenging. Students signing up to participate in a SLC knew that this was no longer a cut-and-dry committee, with APEGA doing the planning before the students execute. To succeed on the SLC, students would need to be ambitious and enthusiastic, and know how to work together to accomplish something great.

A BLANK SLATE

Outside-the-box thinkers are important on each SLC because there's no instruction manual on how to improve the transition between post-secondary and the workforce. Or at least if there was an instruction manual, we threw it out. We knew that those who best know how to help out students are students themselves, in consultation with — and under the mentorship of — APEGA Members and staff. That's why we wanted the students themselves, alongside our team, planning the best ways to aid and improve the portfolios and skills of them and their peers.

For APEGA's Outreach Department, as well as the students, it's an arrangement that was nerve-racking at times. Certainly,

it's easier for APEGA staff to take the lead, just as it would be easier for the students to simply do what they were instructed to do. But that doesn't utilize the students' ingenuity and creativity to the best of their ability. Nor does it teach them valuable skills about leadership, project management, and more. We wanted to coach and empower students, not just have an extra set of hands.

So instead, we gave students in our SLCs one goal: help ensure engineering and geoscience students can succeed and thrive after post-secondary. We didn't tell them exactly how to accomplish it, or give them step-by-step instructions on how to execute the perfect initiative. We're mentoring them, and planning a few early events alongside them, but the power to make a difference in engineering and geoscience students is in their hands; not ours.

We recognize that we can have a minor impact on the lives and portfolios of students if we run a great event, but if we can teach them the right skills, and guide them through the process of developing their own initiatives, and finding creative solutions to whatever they're challenged with, that could set them up for success not only in the short term, but throughout their careers.

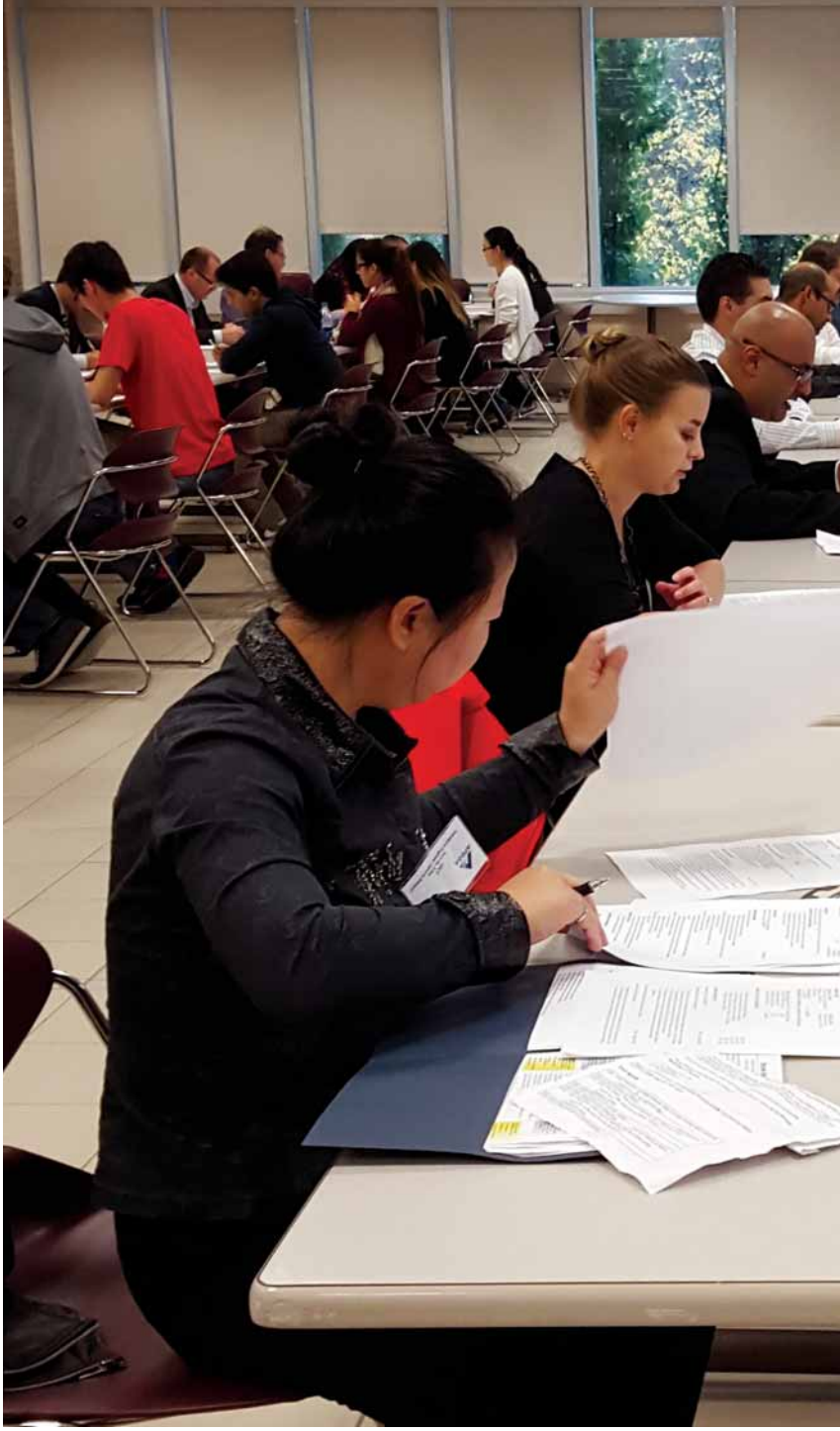
PUTTING IT INTO PRACTICE

As a part of our mentorship of the SLCs, APEGA Outreach teamed up with them to plan two events in both Edmonton and Calgary. Armed with the goal of helping ensure engineering and geoscience students can succeed and thrive after post-secondary, students developed a Rapid Resume Review in September. This event paired industry professionals and HR coordinators with undergrads interested in optimizing their resumes. Students at the event had their resumes reviewed by 10 professionals who offered personalized advice on how each student could get the most from their CV, given their unique work and volunteer experience.

The second event, held in October both in Edmonton and Calgary, was a Speed Mock Interview. This had students simulate quick interviews with Professional Engineers, Professional Geoscientists, and HR reps, who would then offer advice on how to improve techniques and get the most out of any future interviews with potential employers.

Students walked out of both events with improved confidence and the wisdom of experienced professionals in their brains, having received constructive feedback from those further along in their careers.

For both events, scheduling, coordinating, developing the format, and marketing came from the students themselves. Having run similar events in the past, the APEGA Outreach team always looked for opportunities to provide wisdom and guidance and to mentor the students in their new role, but the responsibility for the events, as well as the pride that comes from running them, belonged to them.



As could be expected, students in the SLC have plenty to be proud of so far. Demand for the events was so high that all available spots were filled within days. The students who were fortunate enough to attend were unanimous in their appreciation, thanking APEGA, the SLCs, and volunteers for their dedication to improving students' resumes and interview skills.

After each event, the SLC debriefed and determined how to adjust future initiatives, based off of comprehensive feedback from each student at the event. With a desire to continuously improve, as well as the measures and structure in place to do so, SLCs can continue to grow the impact of their activities, and further improve engineering and geoscience students' ability to succeed and thrive after post-secondary.

BUILDING FUTURE LEADERS
APEGA's Student Liaison Committees are taking a more hands-on role in organizing events to help engineering and geoscience undergrads strengthen their soft skills — like this Rapid Resume Review held last fall at the University of Alberta. While APEGA's Outreach team still provides support, students on the committees are now responsible for running events, which helps them develop valuable leadership and project management skills.

A SMOOTH TRANSITION

Students coming out of post-secondary over the next few years will learn a lot about what makes Alberta unique in the world economy. There's a certain culture in our province, one that's tough to convey in a classroom. Albertans are passionate about what we do. We're committed to innovating and improving; refining and adapting; and coming up with creative solutions to the problems we face.

Students who have experience tackling large-scale issues ("how can we help people thrive post-graduation?"), thinking outside the box, leading initiatives, and organizing events that serve a larger goal are going to be those that help further establish Alberta as an economic leader for ideas and industry in Canada and beyond. These students will be a valuable commodity as they walk up to receive their degree, and the skills they picked up in university have the potential to make an impact on far more than just their career.

"We didn't tell students exactly how to accomplish initiatives or give them step-by-step instructions on how to execute. We're mentoring them, and planning a few early events alongside them, but the power to make a difference in engineering and geoscience students is in their hands; not ours."

A Brief Introduction to the Board of Examiners

Volunteers on APEGA's Board of Examiners (BOE) have a big responsibility. They play a key role in protecting the public and serving the public interest by ensuring the individuals we license are qualified to practise engineering and geoscience in Alberta. Each year, the board reviews thousands of membership applications to ensure that applicants meet APEGA's licensing requirements.

More than 60 Professional Engineers and Geoscientists serve on the board, as either academic or experience examiners. It's their job to assess the academic or work experience qualifications of applicants, while also reviewing English language competency, character, and knowledge of ethics and law.

Examiners are a dedicated group. Most of them spend 20 or more hours a month reviewing applications and attending board meetings. Despite the workload, they're committed to processing all applications as quickly as possible — but at the same time ensuring a fair and rigorous review takes place.

On the next few pages, we'll introduce you to two longtime board volunteers, both of whom say serving on the board is a professional duty — and a pleasure.

TODAY
Anil Gupta, P.Eng., FEC., FGC (Hon.), has designed and built numerous oil and gas refineries around the globe. Today, he works as an advisor (Integration Commissioning Start-up) for the North West Redwater Partnership and is based in downtown Calgary. For the past decade he's also been a volunteer on APEGA's Board of Examiners.
-photo by Candice Ward Photography

And You ARE?

Anil Gupta, P.Eng., FEC., FGC (Hon.)

History Buff • World Traveller • Board of Examiners Volunteer

BY **CORINNE LUTTER**
Member & Internal Communications Coordinator

Throughout his career, chemical engineer Anil Gupta, P.Eng., FEC, FGC (Hon.), has used the latest technology to design and build oil and gas refineries around the globe. When he heads out on vacation, though, he likes to discover things that aren't quite that new. It's ancient technology and past civilizations that grab his attention. The history buff is likely to be found visiting archeological sites and museums — even though a trip to Disneyland is not out of the question.

"I like travelling to see new places and visiting museums to see the history and art. It's very inspiring for me to see how people worked and lived in the past," explains Mr. Gupta, a longtime APEGA volunteer who serves on APEGA's Board of Examiners as well as the Calgary Branch Executive.

On a recent holiday to southern India, Mr. Gupta visited ancient temples. One of his favourites was the Brihadeeshwara Temple of Tanjore, which dates from around 1010 AD. Not only are the temple's elaborate stone carvings fascinating works of art, but the structure itself is an engineering marvel of interlocking stones without binding material.

Whether he's admiring the Mona Lisa at the Louvre in France, checking out Scythian antiquities at the Hermitage Museum in St. Petersburg, Russia, discovering Michelangelo sculptures at the Vatican, or learning about pioneer life in Canada at the Glenmore Museum in Calgary, this APEGA volunteer is captivated by the stories and secrets of bygone eras. Just how did they build those colossal pyramids in Egypt, anyway?

"It's amazing – but a mystery — how they built the pyramids when there were no cranes and no other heavy lifting equipment," says Mr. Gupta, who visited Egypt and several Mediterranean countries in 1988.

AN APTITUDE FOR ENGINEERING

Growing up in the city of Muzaffarnagar, India, a teenaged Anil was more interested in math and science — physics and chemistry in particular — than history. A high school aptitude test steered him towards engineering, so that's what he decided to major in when he left home to study at the Indian Institute of Technology. After graduating, he started a four-decade-and-counting career by working for a large engineering, procurement, and construction (EPC) company specializing in oil refineries and gas plants.

YESTERDAY
Anil Gupta, P.Eng., on his first trip to Canada in 1990, inside a Shell airplane on his way to visit the company's Waterton gas plant near Pincher Creek. He enjoyed Calgary so much that he decided to move there.
-photo courtesy Anil Gupta, P.Eng., FEC, FGC (Hon.)

After working there several years, he and his family moved to Kuwait, where all told he spent 16 years, spending his work hours designing and building refineries for the Kuwait National Petroleum Company (with a short two-year stint in Japan). And then, in 1990, life took an unexpected turn: Iraq invaded Kuwait. Mr. Gupta was on a business trip to Japan when Kuwait was attacked. It was fortunate, too, that his wife and two young children were safe in India at the time.

"So I returned to India in limbo," he recalls. "I enjoyed the first two months of nothing to do, but

then I got bored of sitting at home."

He took a job at another company for a few months, waiting to see what would happen. Soon after, coalition forces ousted Iraq from Kuwait and he got a call from his former manager in the war-ravaged country. "I need you back and I need you tomorrow," the caller said. "Your ticket is on the way and I'm not asking you to come as an employee; I'm asking you as a friend. I need you to rebuild this refinery."

Says Mr. Gupta: "I couldn't refuse."

When he returned to Kuwait, 700 oil wells were still burning. Bullets littered roads. And the refinery he had helped build was heavily damaged. "You couldn't see the sun, it was so cloudy with oil-well smoke," he remembers. It took almost two years to rebuild the refinery and for his family to return to Kuwait.

ON THE ROAD AGAIN

By 1995, Mr. Gupta was looking for new opportunities. He thought about moving to the United States and Australia. Then he remembered a business trip he'd made to Calgary five years earlier. The city had made a good impression.

"The people I talked to were humble and welcoming. And the city was also multicultural, clean, well-maintained," he says. He submitted an immigration application form and applied for his P.Eng. licence. Both were approved, and less than a year later he started work in Calgary at a major EPC company.

Since coming to Canada, he's worked on numerous oil sands and upgrader mega-projects across Alberta. Today, he's Advisor (Integration Commissioning Start-up) for the North West Redwater Partnership, which is building the world's first bitumen refinery, about 45 kilometres northeast of Edmonton.

Mr. Gupta began giving back to his profession as an APEGA volunteer in 2001. He first sat on an APEGA mentoring advisory group, then joined the Calgary Branch Executive a year later. He's been on the Executive ever since, including time as Chair. In 2006 he was accepted for yet another volunteer role — an experience examiner on APEGA's Board of Examiners (BOE).

CONTINUED ON PAGE **64** ››

GETTING TO KNOW YOU

What is your favourite movie? *The Sound of Music*. It's a classic — a light movie you can watch with family.

Favourite lunch spot? Being vegetarian, I have limited choice when eating out. I like to go to Royal Cuisine — they serve buffet lunch with a quick turnaround and a reasonable variety.

Favourite quote? Mark Twain: "The secret of getting ahead is getting started."

Ideal vacation spot? Disneyland in California. I've been there a number of times. My favourite ride is Pirates of the Caribbean.

What are the top three places on your bucket list? Australia, China, South America.

What is the background photo on your smartphone? My grandsons, Atharv and Agam.

What do you think you will be doing 10 years from now? Relaxing with a book and watching the grandkids grow.

What was the last book you read for fun? *Chandrakanta*. It's a Hindi novel written by Devaki Nandan Khatri in 1888. It's considered the first work of prose in the modern Hindi language.

Who has been the biggest influence on your life? My first manager, B.R. Choudhry, taught me that it's important to look after your staff and mentor young engineers.

How has your life been different from what you'd imagined? I believe in taking life as it comes and respecting God. We only have control of what we can do and not of what others do — so accept it.

If you could meet anyone, living or dead, who would it be and why? My mother. She's no longer with us. I always miss her.

What's the best museum you've visited around the world? Hermitage Museum in St. Petersburg, Russia, is probably the best. You need at least two weeks to visit. Among the many other museums I've enjoyed are Royal Museum of Fine Art in Belgium, for its Rembrandt paintings; Neues Museum in Berlin, which has a 3,300-year-old Nefertiti statue; and the Hiroshima Peace Memorial Museum in Japan.

Do you have other hobbies? I enjoy playing bridge and collecting coins. I had a huge collection of ancient and current coins from various countries around the globe, which I lost during Iraqi invasion of Kuwait. I've started building my collection again from scratch.

And You ARE?

Dr. Philippe Erdmer, P. Geol., FGC, FEC (Hon.)

The Erdmanator • Skipper • APEGA Board of Examiners Volunteer

YESTERDAY
His work as a geologist took Philippe Erdmer, P.Geol., PhD, to almost all of the provinces and territories, including remote locations like the Yukon's Ruby Range. This photo, taken around 1988, shows him in the field mapping the region's geology as part of his research into the evolution of the Canadian Cordillera — the still-evolving mountain belt at the western edge of the North American tectonic plate.
-photo courtesy Philippe Erdmer, P.Geol., PhD, FGC, FEC (Hon.)

For most undergraduate geology students, field school is the highlight of the year. It's an opportunity to travel to remote locations, usually in the mountains, and put into action the geological theories they've learned about in class.

It's a pretty awesome experience for professors, too.

Just ask Dr. Philippe Erdmer, P.Geol., FGC, FEC (Hon.), who led dozens of field school excursions over his 25-year career as a professor in the University of Alberta's Department of Earth and Atmospheric Sciences.

Although it wasn't part of the course, he enjoyed challenging his young students to race him up the mountainside. Not for marks, though. Just for bragging rights. More often than not, he'd beat them to the finish line. "There weren't too many who came in ahead of me," he says with a laugh, chalking up his success to "cunning and experience."

His endurance earned him the respect of his students — and the nickname The Erdmanator.

Since retiring about five years ago, Dr. Erdmer continues to push the limits. He moved with his wife, Liz, who also has a background in geology, to Salt Spring Island, off Canada's West Coast. There, he can be found racing his 30-foot sailboat around the Gulf Islands as often as the weather allows.

He recounts the story of a four-hour race a few days earlier, in which eight boats finished within a minute of each other. Sailing has been a passion since he was a young boy.

"It's the thrill of the chase." Not to mention the perfect test of physical and mental stamina. "It's an athletic pastime with a constant learning curve, and an intellectual game comparable to tournament chess, where you plan many moves ahead and work against the clock."

Being tired, wet, cold, and frustrated at having to recover from tactical and strategic mistakes are trumped by the fun factor, Dr. Erdmer says, in a discussion about reading the wind, getting the boat in the groove, and beating the competition. "Like much worth doing in life, it is experiencing success after taking a chance."

NEW ROOTS, OLD TIES

Although he's put down new roots in B.C., Dr. Erdmer's ties to Alberta's geoscience community remain strong. He continues to spend many hours each month volunteering as an academic examiner on APEGA's Board of Examiners. Thirty years on, he's one of the board's longest serving volunteers.

It all started when he was a new professor at the U of A. Fellow professor and renowned geoscientist Dr. Charlie Stelck, OC, P.Geol., FGC, FEC (Hon.), suggested that Dr. Erdmer take over as his replacement. "He was ready for some relief after 37 years. That was in 1985 and I'm still on the BOE, still trying to fill his shoes," says Dr. Erdmer.

The reasons for Dr. Erdmer's tenure on the board are plenty. For one, he's committed to giving back to the professions. "I can't think of being a Member of APEGA and not participating in its life," he says. "APEGA service is my main opportunity to support the concept and reality of my chosen profession, which has been very good to me. So it's just normal payback and common sense."

Most satisfying, he says, is working alongside other professionals, many of whom have become great friends over the years.

"You don't serve on an APEGA committee if you don't fundamentally agree with the mission, and it's a thrill to work with like-minded individuals," explains Dr. Erdmer. "I am always amazed at how competent, straightforward, and unassuming my colleagues on the board are. There's something about the Alberta spirit — an egalitarian, we'll-help-you-get-it-done attitude — which is most appealing to me."

Also rewarding: seeing hundreds of his former students apply for and earn their professional licence with APEGA. "It's satisfying to see them enter the professions no longer as my students, but as my colleagues. Many are now working in Canada and all over the world."

GROUNDED IN SCIENCE

Long before arriving in Alberta, a young Philippe grew up travelling the world as a self-described army brat. His dad, a Belgian military officer and UN peacekeeper, took his family with him on assignments to places like Syria, Jordan, Palestine, Tunisia, Algeria, Rwanda, Burundi, Tanzania, Uganda, Switzerland, and France (where he got his first taste of sailing while at summer camp).

When he was 16, his family moved one last time, this time to Ottawa, where a high school teacher introduced him to the Earth sciences. He later went on to earn a bachelor of geology degree from the University of Ottawa, followed by his master's and a PhD at Queen's University, both in geology.

Early in his career, Dr. Erdmer worked across Canada in mineral exploration and spent time working for federal and provincial geological surveys and teaching geology at the Royal Military College of Canada. He's supervised numerous M.Sc. and PhD candidates and led both national and international scientific research projects. His work has taken him to almost all of the provinces and territories, including places in the Far North that most Canadians have never seen or even heard of.

"I still love geology, all these years later," he says. "I can never disconnect from its fundamentals. Not to make a pun, but it keeps you grounded. In

TODAY
Philippe Erdmer, P.Geol., PhD, races Kaitoa, his Ross 930 sailboat, around the Gulf Islands.
-photo courtesy Philippe Erdmer, P.Geol., PhD, FGC, FEC (Hon.)

these days of Twitter debates about global change and the predictive ability of scientists, that is not a small intellectual comfort. The geological record of Earth is an open book and is there for all to read; it cannot be changed, so it is the ultimate reference."

That love of geology is another reason for his continued involvement with the APEGA Board of Examiners.

"I'm retired and therefore busier than ever. But I'll keep going for as long as I have the energy. It does take a special kind of individual to step up and it's not fun all the time. But it is important."

DID YOU KNOW?
In 2014, APEGA received over 9,200 membership applications. Almost half of the applicants were internationally trained.

CONTINUED ON NEXT PAGE ››

GETTING TO KNOW YOU

What is your favourite movie? I just watched *Master and Commander: The Far Side of the World*, for yet another time. My kind of movie magic.

Favourite lunch spot? Either a mountain top after a hard climb or a super-duper sushi restaurant like Tojo's.

Favourite quote? Albert Einstein: "Condemnation without investigation is the height of ignorance."

Ideal vacation spot? The beaches of south Maui and the Ile Saint-Louis in the 4th arrondissement of Paris have been favourites.

What are the top three places on your bucket list? Australia and New Zealand, with a stop in the South Pacific atolls along the way.

What is the background photo on your smartphone? Right now, a space shot of Earth centered on the west coast of North America.

What do you think you will be doing 10 years from now? I guess I'll be a senior. I'm not 60 yet so I can't imagine. I hear that life is like a roll of toilet paper, the closer you get to the end, the faster it goes.

What was the last book you read for fun? *The Billionaire and the Mechanic*, by Julian Guthrie. It's a true story about Larry Ellison, co-founder and billionaire CEO of Oracle Corporation, who decided to run for the coveted America's Cup sailing race and found an unlikely partner in a car radiator mechanic from San Francisco.

Who has been the biggest influence on your life? Ordinary as it may sound, my mother and father in childhood, and, since becoming married, my spouse. It's predictable and it works.

How has your life been different from what you'd imagined? I have been lucky in the lottery of life. There are not many people I would trade places with. I try to keep it in perspective.

If you could meet anyone, living or dead, who would it be and why? Anyone who agrees with me that the greatest mistake you can make in life is to continually fear you will make one.

What might someone be surprised to know about you? I spoke fluent Arabic and Swahili as a kid, as well as English and French. Although my professional training and career were entirely in English, I think and speak to myself in French.

Do you have other hobbies? I recently joined a Scottish pipe and drum band, as a side drummer. I'm a bit short of formal instruction and tend to be more enthusiastic than impressive, but I am having a riot of a time and the rest of the band is understanding.

CONTINUED FROM PAGE **60** ››

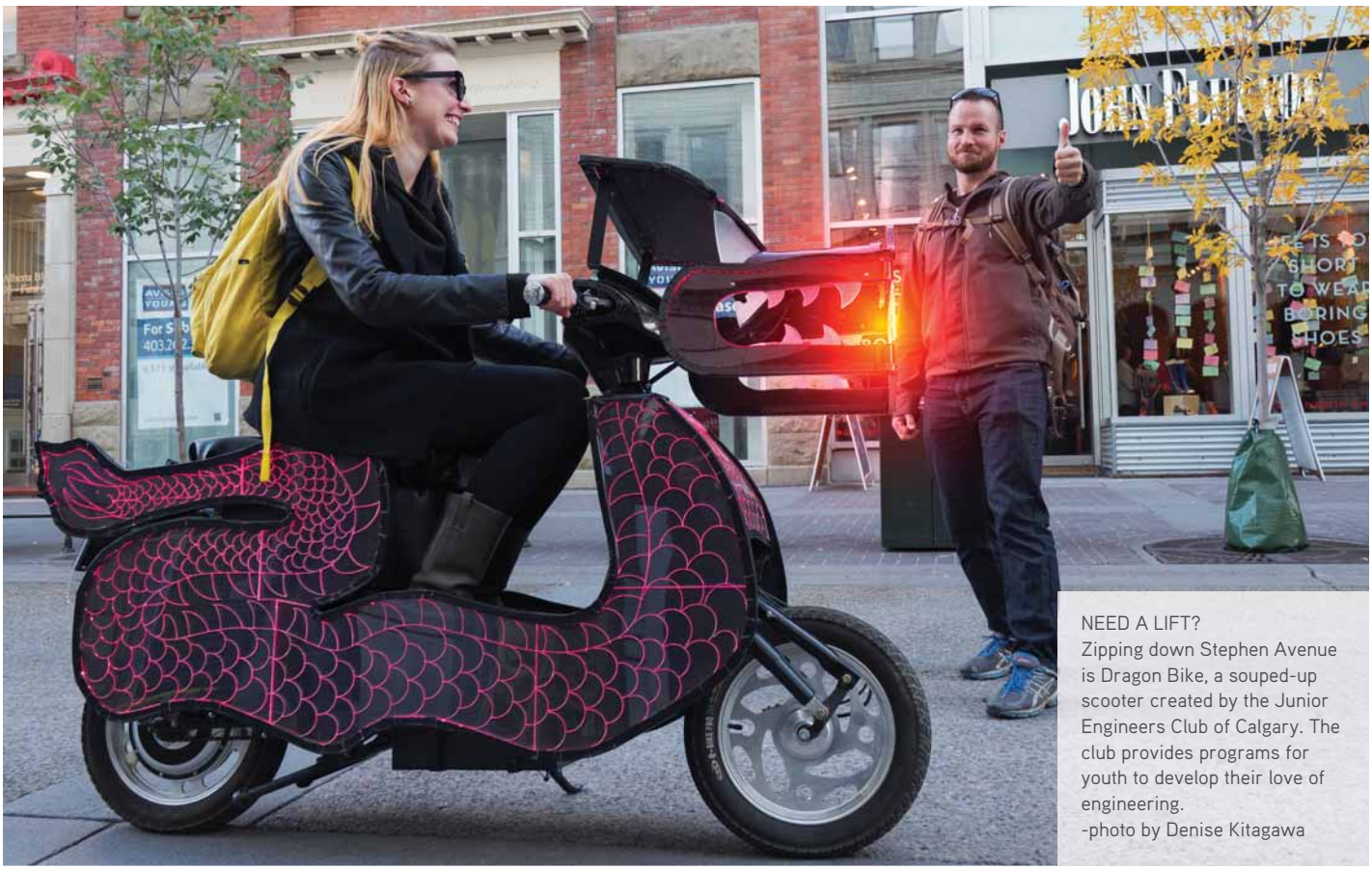
Over the past decade, Mr. Gupta has reviewed hundreds of licensure applications, a job he takes very seriously. He spends about 30 hours a month assessing files to verify that applicants with a chemical engineering background have the required work experience.

"I have a duty to thoroughly review the files and determine whether applicants meet the experience requirements, and then I provide my recommendation on that," he says. "As a board member, it's my job to protect public safely by ensuring that only qualified professionals are licensed."

Mr. Gupta understands how important licensure is for engineers and geoscientists who are starting a new life in Alberta. While international applications can be complex, he and other board members are committed to processing all applications as quickly as possible, but without sacrificing the rigour needed to serve the public interest.

He's also part of a BOE policy committee reviewing board processes and exploring more efficient ways to assess applicants without compromising professional standards. More recently, he became part of APEGA's champions collaborative, a group of about 40 Professional Engineers and Professional Geoscientists who are engaging Members and Permit Holders in APEGA's ongoing legislative review process.

"I find it very rewarding to give back to my profession, because my profession has given me a lot and it's why I am where I am today," says Mr. Gupta. "It feels good to volunteer. I feel proud to contribute. And it's also a learning exercise for me — it keeps me up-to-date on what's happening in my profession."



NEED A LIFT?
Zipping down Stephen Avenue is Dragon Bike, a souped-up scooter created by the Junior Engineers Club of Calgary. The club provides programs for youth to develop their love of engineering.
-photo by Denise Kitagawa

All the Buzz at Beakerhead

BY **CORINNE LUTTER**
Member & Internal Communications Coordinator

Have you ever marvelled at the aerial acrobatics of a dragonfly zipping through the air? The folks in Festo sure have. They were so inspired, in fact, that they decided to build a robot that could do the same. Enter the BionicOpter. Like a real dragonfly, it flies up, down, forwards, backwards, and sideways — and then, to top it off, it hovers like a helicopter and floats like a glider.

The ultralight drone awed spectators when it took flight at Beakerhead, the annual science, technology, engineering, and arts spectacle held September 16 to 20 in Calgary and sponsored in part by APEGA. Festo, a German technology company with offices in Mississauga, specializing in industrial automation, partnered with the University of Calgary and the university's Schulich School of Engineering to bring the BionicOpter to Beakerhead.

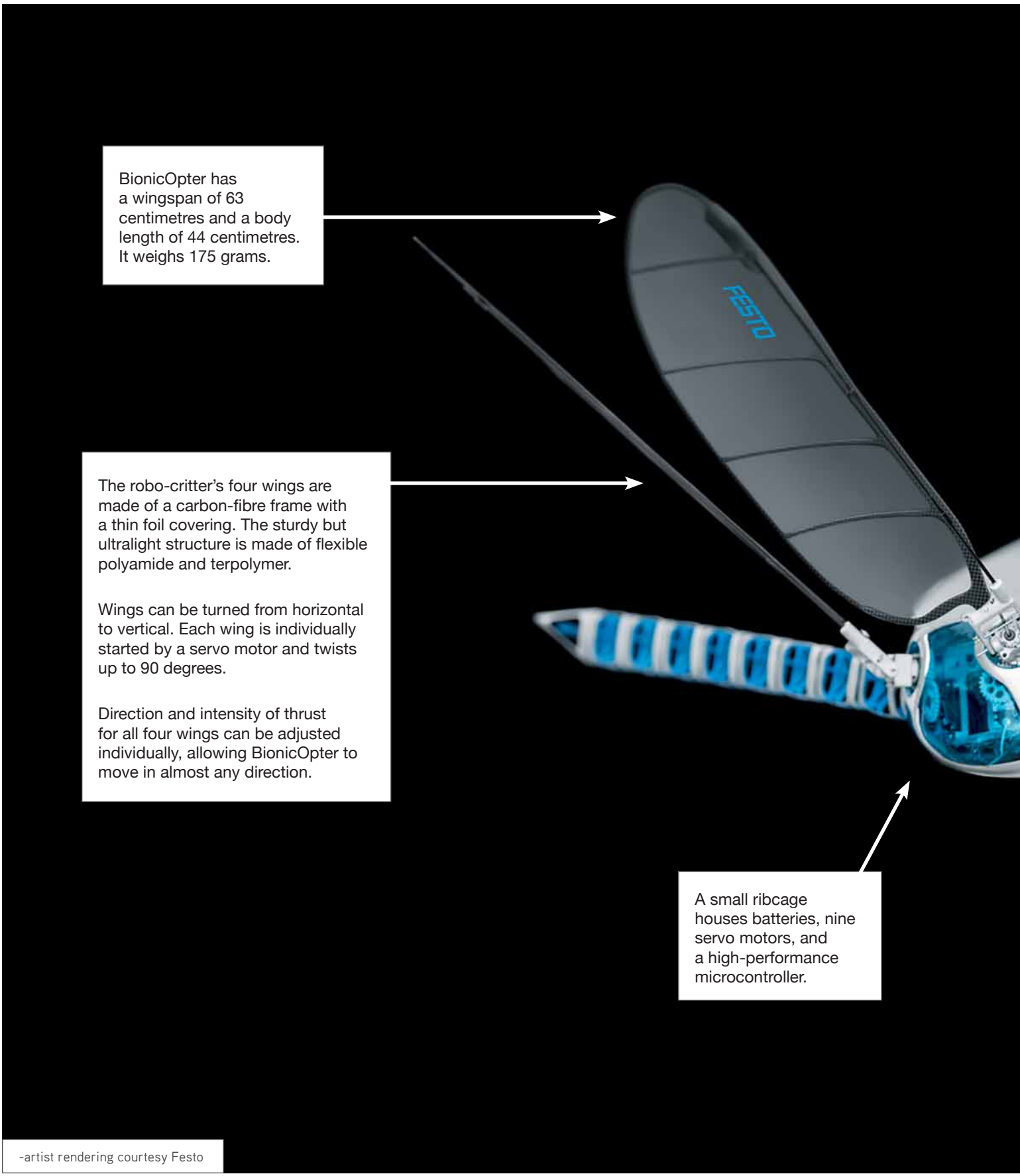
Festo is part of the Bionic Learning Network, a group of universities, institutes, and companies that develop machines inspired by nature. Previous projects include SmartBird, which mimics seagull flight, and the jumping BionicKangaroo, which converts the energy from one bounce to power the next. Another creation, the Bionic Elephant Trunk, is used in the real world as a robotic handling assistant.

BEAKERS AHEAD

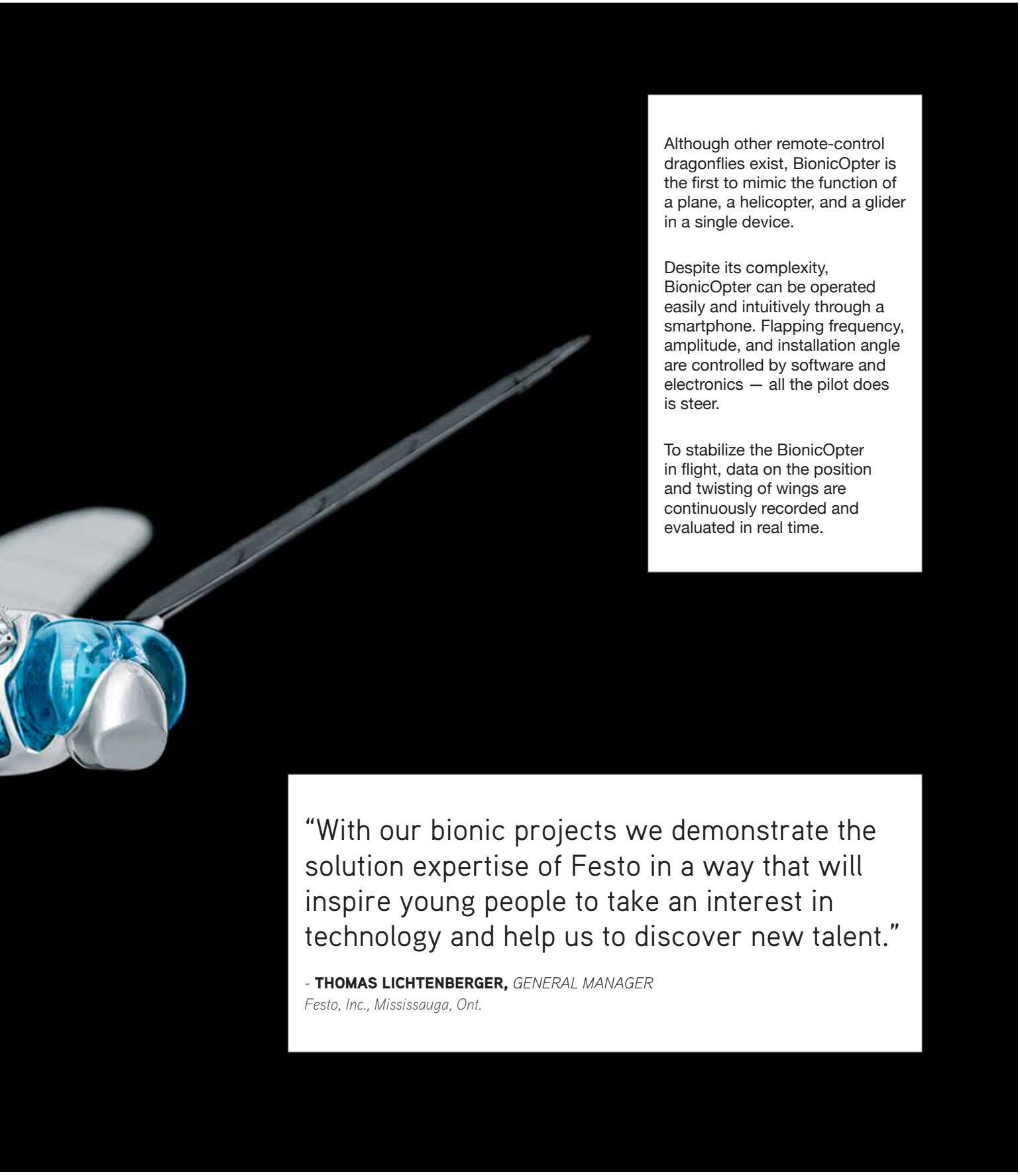
Beakerhead brings together the arts and engineering sectors from across Calgary, the province, the country, and the world, allowing them to build, compete, and exhibit interactive works of art, science, spectacle, and entertainment. The five-day international phenomenon of art, culture, science, and technology returns to Calgary September 14-18, 2016.

BEAKERHEAD 2015 BY THE NUMBERS

- 62 events
- 14.7 million social media impressions (up nearly 200 per cent from 2014)
- 148 local artists
- 30 artists from around the world
- 7,000 mushroom blocks used for IN/FLUX public art installation
- 11 dogs involved in a dog orchestra called Pavlovian Rhapsody
- 31 restaurants that created engineered eats



-artist rendering courtesy Festo



Although other remote-control dragonflies exist, BionicOpter is the first to mimic the function of a plane, a helicopter, and a glider in a single device.

Despite its complexity, BionicOpter can be operated easily and intuitively through a smartphone. Flapping frequency, amplitude, and installation angle are controlled by software and electronics — all the pilot does is steer.

To stabilize the BionicOpter in flight, data on the position and twisting of wings are continuously recorded and evaluated in real time.

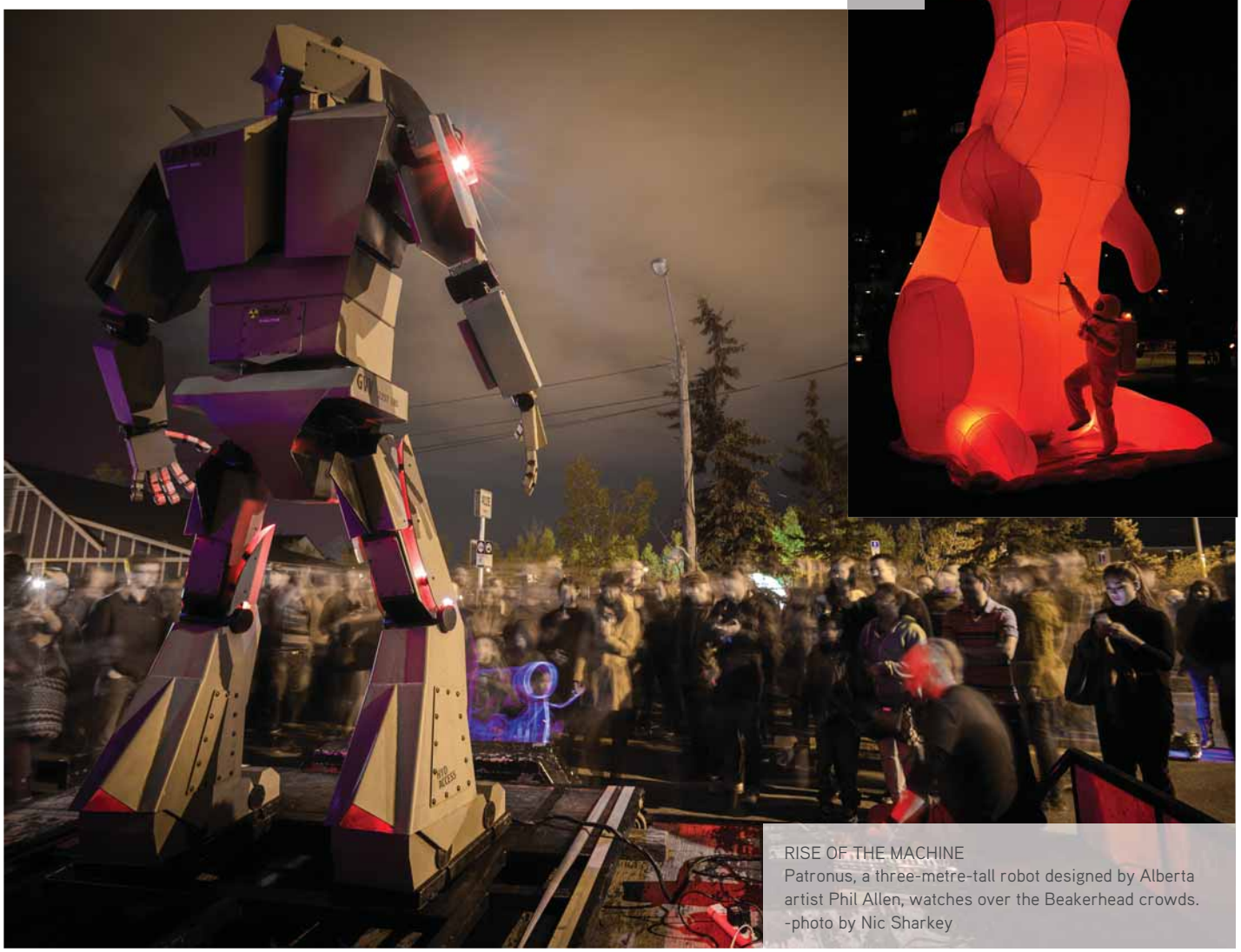
"With our bionic projects we demonstrate the solution expertise of Festo in a way that will inspire young people to take an interest in technology and help us to discover new talent."

- **THOMAS LICHTENBERGER,** *GENERAL MANAGER*
Festo, Inc., Mississauga, Ont.

FIRE STARTER
Spectators play Skee Ball by Site 3 Flame Arts, a giant fire-spitting arcade game.
-photo by Nic Sharkey

FLIGHT OF THE DRAGONFLY
A BionicOpter demonstration at the University of Calgary enthralls children and adults alike.
-photo by Cynthia Radford

DOWN THE RABBIT HOLE
A giant bunny, part of the Intrude art installation by artist Amanda Parer, gets its belly scratched by the Beakerhead astronaut.
-photo by Cynthia Radford



RISE OF THE MACHINE
Patronus, a three-metre-tall robot designed by Alberta artist Phil Allen, watches over the Beakerhead crowds.
-photo by Nic Sharkey

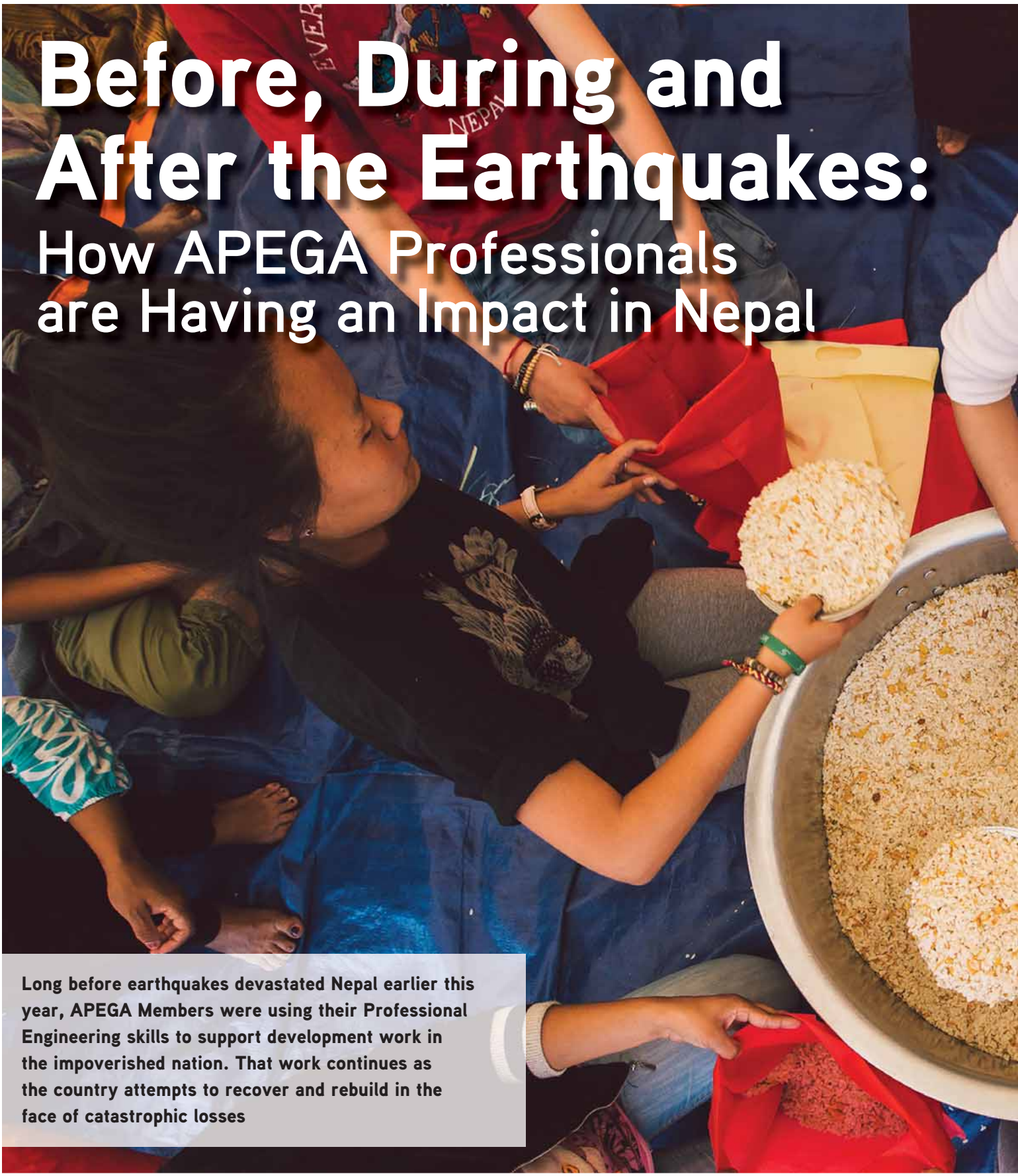
Proudly brought to you
by Professionals in
Engineering and Geoscience

APEGA

www.apega.ca

Before, During and After the Earthquakes:

How APEGA Professionals are Having an Impact in Nepal



Long before earthquakes devastated Nepal earlier this year, APEGA Members were using their Professional Engineering skills to support development work in the impoverished nation. That work continues as the country attempts to recover and rebuild in the face of catastrophic losses

HELPING HANDS
Students from Shree Mangal Dvip Boarding School put together food packages for delivery to devastated villages.
-photo courtesy Sebastian Stiphout

BY **CORINNE LUTTER**
Member & Internal Communications Coordinator

Shortly before noon on Saturday, April 25, children from the Shree Mangal Dvip (SMD) Boarding School in Kathmandu, Nepal, were eating in the dining hall. A 7.8-magnitude earthquake struck the region. Beyond the complex, brick walls crumbled into the streets and buildings turned to rubble.

Seven-year-old Tsering Yangzom was on her way to the dining hall when the walls and stairs started to shake around her. Plaster cracked and fell to the ground. After the quake was over, the little girl with a sweet smile and long brown hair told Shirley Blair, the school's director, what was going through her mind. "I felt that I am going to die."

Ms. Blair, a native of Victoria, B.C., was in her office when the earthquake struck. She took cover under her desk and started praying and could hear people screaming outside.

Fortunately, none of SMD's students and staff were hurt. Ms. Blair quickly posted a Facebook message to reassure friends, family, and SMD supporters that, despite damage to school buildings, everyone at the school was OK: "Some fatalities in the neighbourhood. We are sheltering neighbours. Food, water, meds going to be needed in the valley. Here too."

Students soon learned that many of the remote mountain villages where their families live had been flattened. Two children lost parents. Across the country, the death toll was more than 9,000, with another 23,000 injured. Infrastructure damage was measured in billions of dollars.

EDMONTON IMPACT

More than 10,000 kilometres away in Edmonton, retired civil engineer Andrew Mitchell, P.Eng., was shocked to learn of the destruction. "I thought, good heavens, what's happened to the school?" He went online, relieved to read that everyone was safe.

Although he's never travelled to Nepal, Mr. Mitchell has strong connections to SMD. He met the school's founder, Tibetan Lama Thrangu Rinpoche, more than 35 years ago. Over the years, he's followed the lama's humanitarian work in Nepal, including his schools for impoverished Himalayan children.

About 10 years ago, supported by stories in this magazine's predecessor, a newspaper called *The PEGG,* Mr. Mitchell asked fellow APEGA professionals to develop a seismic retrofit plan for A Block, SMD's oldest dormitory. There were fears that the four-storey dorm, which houses half of the school's 600 children, would "go down like a deck of cards" if a major earthquake hit, he says. With the Kathmandu Valley located in a high-risk seismic zone, experts had warned for years that a megaquake was inevitable.

Other civil engineers, all Professional Engineers licensed by APEGA, helped Mr. Mitchell with the retrofit. Antoni Kowalczewski, P.Eng., took the lead on the redesign. John Alexander, P.Eng.,

A FACE OF HOPE
Seven-year-old Tsering Yangzom, all smiles for this photo, feared for her life when a 7.8-magnitude earthquake struck Nepal on April 25. She and many of her classmates spent weeks living in tents.
-photo courtesy Shree Mangal Dvip Boarding School

Peter Little, P.Eng., and Dean Mullin, P.Eng., all provided support at different stages of the project.

The retrofit took several years, with actual construction happening in 2007. Mr. Mitchell's son Ross, a home builder who specializes in environmentally friendly design, spent three months in Nepal overseeing the project. There wasn't enough money in the budget to fix the walls, so the team focused on strengthening A Block's central stairwell, including putting in two extra columns for support.

"The school is vulnerable," notes Mr. Mitchell. "The walls are brick infill and not tied into the reinforced concrete frame, so they can pop out in an earthquake."

Still, it appears their work paid off — A Block suffered only superficial damage in the quake. It also withstood a subsequent 7.3-magnitude quake on May 12.

The building with the dining hall is no longer safe to use. A seismic engineer has warned that it could shear above the second floor in something as mild as a tremor. The school does have funding for the repairs, but it needs government permission before work begins and that's slow to come. Two other main buildings were damaged but have been cleared for use — with caution.

In the aftermath of the quakes, more than 200 students spent over a month living under tarps and tents on the school's soccer pitch while they awaited word on the buildings' safety. Joining them were school staff and neighbours who had lost their homes. At times, monsoon rains flooded the area, leaving behind ankle-deep mud and sewage.

Engineers eventually gave A Block the green light, allowing some students to move back in. Rain and the threat of typhoid eventually forced the rest of the SMD family to move back into two other minimally damaged buildings. Classes have restarted in temporary outdoor shelters and two damaged buildings. Engineers have warned teachers in the buildings to stay on high alert and leave doors open for quick exit.

> "The school is vulnerable. The walls are brick infill and not tied into the reinforced concrete frame, so they can pop out in an earthquake."
>
> - **ANDREW MITCHELL,** *P.ENG.*

Despite the challenges SMD faced, Ms. Blair considers the staff and students there fortunate. Across Nepal, 20,000 schools were destroyed and one million children can't go to school.

"Our kids and their families are amazingly resilient. They just get on with it and help others," Ms. Blair says. "We delivered aid packages until desperate villagers started to attack convoys and until five of our older kids got trapped by landslides."

The estimated cost to repair and retrofit the damaged SMD buildings is US $200,000, although the school's longtime dream is to build a larger, earthquake-resistant campus in the Kathmandu Valley, with space for more students away from the current location in the crowded and polluted city of Kathmandu itself.

Whatever the school does, Mr. Mitchell will continue to lend support. He organized a fundraiser in September, with Derrick Harrison, P.Eng., an APEGA Life Member, donating his time to make a presentation on an unrelated subject.

Mr. Mitchell has also appealed to APEGA Members, through the e-PEG, to provide whatever support they can. Donations to the SMD School Building Fund can be made to Namo Buddha Foundation, a registered Canadian Charity. "SMD gives these children an opportunity for education. There are no schools in the high Himalayas where they're from. Many of the children may not have survived without the school," he says.

Also coming forward again is Mr. Kowalczewski, Principal of Janto Engineering, who offered to travel to Nepal after the quakes to assess the damaged buildings. The trip wasn't needed for now, but he's ready to help out again, should his engineering skills be required in the future. "I'm at a stage in my life that I can help out more. It's good to give back," he explains.

FINDING SHELTER
SMD Students sleep under tarps on the school's soccer pitch after the April 25 earthquake. Later, they returned to their dorms after safety inspections.
-photo courtesy Sebastian Stiphout

‘Am I Dreaming?’

He was there as a tourist. But an interrupted nap later, Sanat Pokharel, P.Eng., was a worried son and professional, hoping a home he’d designed would withstand the earthquake that shook Kathmandu

Three days into his vacation in Nepal on April 25, Sanat Pokharel, P.Eng., a civil engineer who lives in St. Albert, decided to grab a nap. He had spent the morning visiting Pashupatinath Temple in Kathmandu. A loud rumbling jolted him awake — it was like the sound of rebar cracking, which he normally only hears in the lab during tests.

“Am I dreaming?” he thought. “Did a tornado hit?”

Getting up, he quickly realized this was an earthquake. Even though he grew up in Nepal and has lived there as an adult, it was not like any he had experienced. “The ground went on shaking for quite some time,” he says. Dr. Pokharel tried escaping, but the bedroom door in his parents’ home was jammed. His parents banged on the other side. He yelled to them to stand by the door, so the frame might protect them if the walls came down.

“I designed the house myself to be earthquake resistant, but I thought it was going to collapse. I thought I was done,” says Dr. Pokharel.

Although it seemed the shaking might never stop, the quake actually lasted less than a minute. Afterwards, the door opened, and Dr. Pokharel and his parents fled the home to join hundreds of others seeking safety on the street. He started walking around, taking in the damage.

“Our house is close to the prime minister’s residence. I could see the tall walls in the compound were all gone. There were collapsed and damaged houses,” he says. “I worked in Nepal for 18 years. I have seen devastation from floods and other earthquakes. But this was the worst. I was not believing my eyes sometimes.”

Dr. Pokharel volunteered to inspect homes and schools, advising whether they were safe to enter. Over several days, he assessed the damage on about 50 homes in Kathmandu and rural areas outside the city, including 22 he had designed.

The homes he designed — built to be earthquake resistant — were in good shape. Most of the newer homes he inspected in the city featured concrete pillars and beams. They had cracks but could be repaired. Many older homes, however, were no longer safe and needed to be demolished. “I had to tell my uncle that his house needs to be rebuilt. It’s hard for everyone.”

In rural areas, where villagers built their homes from stone, mud, and wooden beams, many buildings had collapsed. Hundreds were homeless. “People were desperate.”

BEFORE THE QUAKE
An hour before the April 25 earthquake, Dr. Sanat Pokharel, P.Eng., visits Pashupatinath Temple in Kathmandu and grabs a selfie. He made it through unscathed and so did the ancient temple.
-photo courtesy Dr. Sanat Pokharel, P.Eng.

LACK OF INSPECTION TAKES HUMAN TOLL

New buildings in Nepal are often designed to withstand earthquakes. But construction work is often not inspected to ensure that standards are met, says Dr. Pokharel. It’s one of the reasons the death toll was so high.

“People don’t follow the bylaws or rules. They sometimes don’t even use engineers for design,” says Dr. Pokharel. “They decide OK, let’s take out two steel rods to save money. I have even found buildings designed by engineers for two or three floors, but then the owner added two more without changing the design.”

While life is slowly returning back to normal in Katmandu, many repairs remain to be done and aid is slow to arrive in many remote areas. Political unrest doesn’t help, and the government has yet to disburse more than US $4 billion in international reconstruction aid.

Dr. Pokharel returned to St. Albert on May 8, and now he worries about the friends and family he left behind. His parents could have come to Canada on visas but chose to stay in their homeland. He continues to be hopeful that the relief funds that poured into Nepal will reach those in need.

“The international community has provided a lot of support,” he says. “We are very thankful.”

"I worked in Nepal for 18 years. I have seen devastation from floods and other earthquakes. But this was the worst. I was not believing my eyes sometimes"

-**DR. SANAT POKHAREL,** *P.ENG.*

DEVASTATION
This is what's left of a five-storey tax office in Kathmandu, one of the many buildings destroyed April 25.
-photo courtesy Dr. Sanat Pokharel, P.Eng.

‘So We Had This Idea’

Hydropower and Canadian technology are combining to change lives in Nepal. Could the ideas put into play by a pair of University of Calgary professors and APEGA Members go worldwide?

A development project to improve the health of Nepalese villagers escaped recent earthquakes unscathed. Led by University of Calgary professors Ed Nowicki, P.Eng., PhD, FEC, FGC (Hon.), and David Wood, P.Eng., work had wrapped up on the two-year project just a few months before the quakes struck. Latrines had been dug, greenhouses built. LED lights were supplied. Energy-efficient wood stoves, water filters, water tanks, and electrical control systems were installed.

Today, the new infrastructure remains in place, helping residents of the remote rural community of Ghodasin improve sanitation and grow their own food. And by tapping into small-scale hydropower systems that already existed, 50 homes are now using clean energy to boil drinking water and cook, instead of producing toxic smoke by burning resinous wood. Previously, electricity was mainly used in homes for compact florescent lamps, radios, TVs, and cell phones.

Dr. Nowicki, an associate professor in electrical and computer engineering at the U of C’s Schulich School of Engineering, is a past recipient of the APEGA Excellence in Education Summit Award. He explains the situation this way: “Water flow for hydro systems in these villages tends to be fairly reliable, but the power is not used all day long. In fact, it’s wasted on purpose so the turbine and generator can be regulated and run at a fairly constant speed. So we had this idea: Why not use the excess power, which would otherwise be wasted, in the powerhouse? Let’s send that power to the homes so they can use it to heat water for drinking and cleaning.”

A $100,000 Grand Challenges Canada Stars in Global Health grant helped launch the project. The grant program supports initiatives that help improve rural health in developing countries. When the funding was awarded in April 2013, work quickly began on the technical part of the project — the development of a Distributed Electronic Load Controller (DELC). The device measures electrical

use in each home and diverts excess power to water tanks, which are actually just simple rice cookers. Babak Roodsari, a former U of C PhD student in electrical engineering, developed the high-tech DELC prototype in the school's power electronics lab, using digital microprocessor technology.

Meanwhile, Dr. Wood and Ram Chandra Adhikari, a U of C PhD student in mechanical engineering who hails from Nepal, visited the country to scout out potential villages to collaborate with. They spent a week trekking to a dozen remote villages, consulting with the locals and inspecting hydro installations.

Dr. Wood is no stranger to Nepal, having worked there regularly over the past 14 years on wind energy projects. He reached out to his contacts at the Kathmandu Alternative Power and Energy Group (KAPEG), an organization focused on bringing renewable energy to rural Nepal, and the group agreed to coordinate logistics.

"They were essential to provide the link between what we thought we could offer, and what was actually needed and required on the ground," says Dr. Wood, NSERC/ENMAX Professor of Renewable Energy in Schulich's Department of Mechanical Engineering.

KAPEG also came up with an innovative idea: Why not use water tanks not only for drinking and cleaning but also for cooking rice and soup? As a result, each of the 50 homes was provided three cookers, one each for hot water, rice, and soup. This aspect of the project — using hydro power to enable villagers to pasteurize water and cook — is something that hasn't been done elsewhere.

A KAPEG engineer refined the DELC prototype, converting it to analogue technology and reducing the cost per unit to just $20 from $220.

"At first we thought we could build maybe five controllers, but KAPEG ended up building 50 units using a simpler technology," says Dr. Nowicki. "They took ownership and made their own version. We were very happy about that."

Dr. Nowicki and Mr. Roodsari tested the prototypes on a few homes near Kathmandu in the spring of 2014. By December that year, the project was mostly complete, including the latrines, greenhouses, and DELC installation.

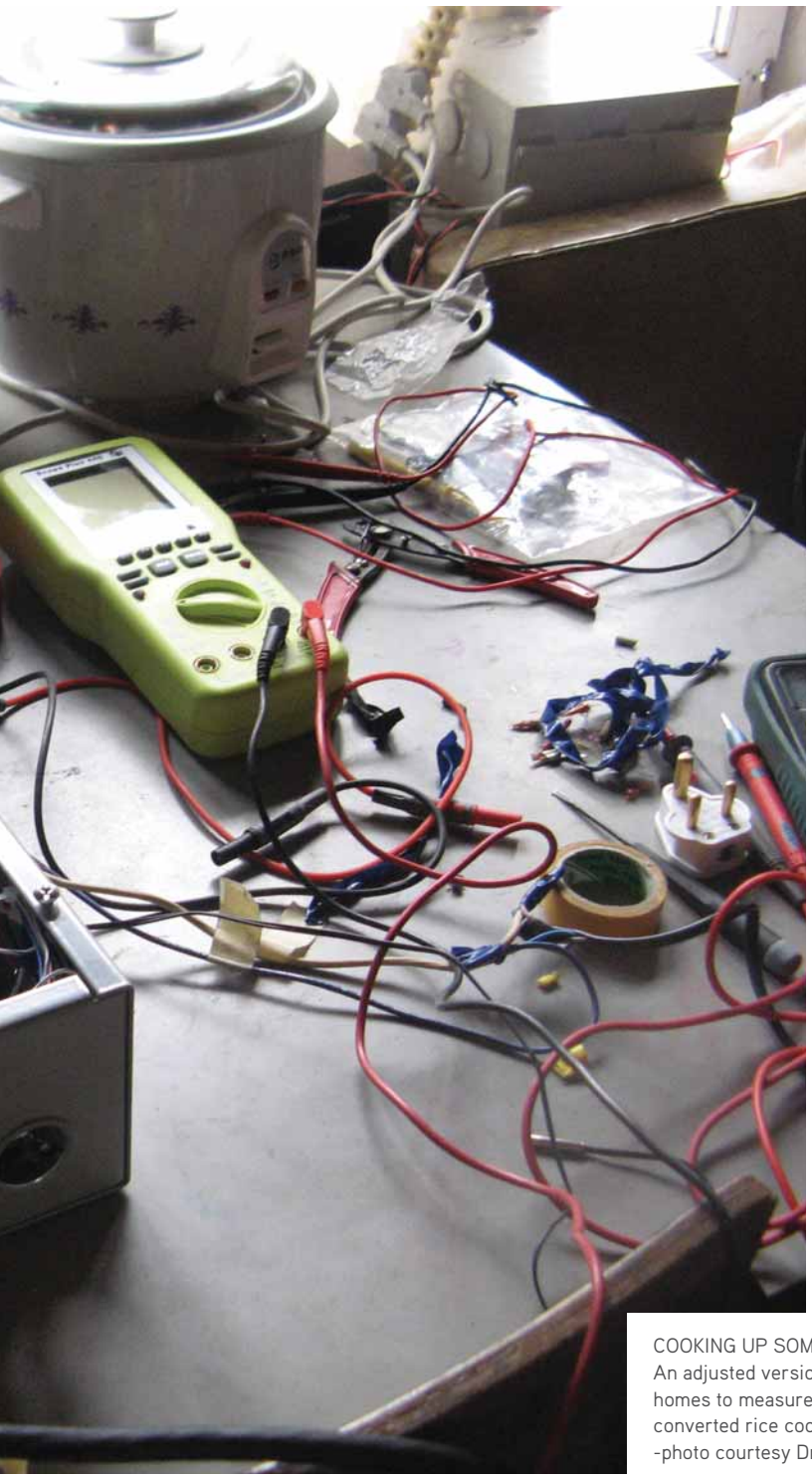
Latrines and greenhouses may not be the kind of international development projects you expect Professional Engineers to work on, but these ones certainly benefited from the holistic approach taken by Dr. Nowicki and Dr. Wood. They looked at the work as a chance to improve villagers' overall living, health, and hygiene standards.

"Let's not just build one project and ignore the rest. You have to work together with the community in order to have some successful impact," notes Dr. Wood.

Indeed, community collaboration was essential to the whole project's success. "We needed to have the local people as equal partners from the beginning to the middle, and continuing into the future. We want them to own the project," says Dr. Nowicki.

To ensure the long-term viability of the project, each household that received a controller pays a monthly fee — about $2 — which goes into a village account. The money is used to pay for the system's ongoing operation, maintenance, and repair.

The project could have economic spinoffs. For example, excess food produced in the 36 greenhouses could be sold. Excess hydro power could be used to power woodworking tools or sewing machines to develop local industries.



COOKING UP SOMETHING GRAND
An adjusted version prototype of the Distributed Electronic Load Controller operates in 50 Nepalese homes to measure electrical use and divert excess power to water tanks. The tanks are actually converted rice cookers for water pasteurization and cooking.
-photo courtesy Dr. Ed Nowicki, P.Eng., FEC, FGC (Hon.)

GOOD WORKS, GOOD REWARDS

For Dr. Nowicki, the project has been one of the most rewarding he's worked on in more than 20 years at the U of C.

"We've got this research side, but we've also got this practical and humanitarian side. It's not often at a university that you can get formal funding to do that," he says. "I love doing engineering research and development, and then seeing the outcome being applied to improve living standards in developing countries. It's that combination that really hooks me."

Dr. Wood is of the same mindset. An Australian who arrived at the U of C in 2010, he has long believed renewable energy has the power — literally and figuratively — to change lives in developing countries.

"I've always been attracted to the idea that renewable energy can be a very strong component of development and poverty alleviation for remote communities. And I'm not just talking about the developing world — I'm talking about remote communities in Australia and Canada, too," he says.

The project has come to an end, sort of. KAPEG is still on the ground, visiting homes with DELC units to evaluate how they're working and being used.

The U of C contingent is committed to doing more development work abroad. The group's dream is for DELC technology to find its way to villages across Asia, India, and Africa, and it's looking for partners around the world. The team has already connected with an engineering company in Ethiopia, and they may end up working together to bring hydro electrification to remote villages there.

The APEGA Members and researchers hope to see the day when disparities between rich and poor are eliminated. "Engineers are fundamentally service beings. We are here to serve the community. We are here to look after our planet," says Dr. Nowicki. "It just seems to be a no-brainier that if we can bring renewable energy technology to the developing world, that's what we should do."

HYDRO HELPERS
Dr. David Wood, P.Eng., (right) and U of C mechanical engineering PhD student Ram Chandra Adhikari (left) pose with a hydro technician in Nepal. The hydro system is housed in the building behind them.
-photo courtesy Dr. David Wood, P.Eng.

"Engineers are fundamentally service beings. We are here to serve the community. We are here to look after our planet. It just seems to be a no-brainier that if we can bring renewable energy technology to the developing world, that's what we should do."

-**DR. ED NOWICKI,** *P.ENG., FEC, FGC (HON.)*

SURFABLES

Thrangu Rinpoche's School for Himalayan Children
beta.himalayanchildren.org

Grand Challenges Canada
grandchallenges.ca

Namo Buddha Foundation Canada
namobuddhacanada.org

A LITTLE WATER GOES A LONG WAY
Below, Dr. Ed Nowicki, P.Eng., checks out a water canal near Kathmandu during a scouting expedition to Nepal in 2014. He led a Grand Challenges project that used small-scale hydropower systems to provide clean energy to rural Nepal homes.
-photo courtesy Dr. Ed Nowicki, P.Eng., FEC, FGC (Hon.)

How APEGA's Member Benefits Help You Plan and Prepare

Being a Professional Engineer or Professional Geoscientist involves making smart, calculated decisions — decisions that keep both the short term and the long term in mind. While this is a skill that will always benefit professional careers, planning is also an important part of our personal lives. It's for this reason that APEGA's Member Services Department has secured a number of benefits, discounts, and special rates for Members taking a close look at their financial picture, now and in the future.

As we've seen over the last year, the sustainability of economic booms and the uninterupted growth of the economy are never guaranteed. When the market is down, having managed your money wisely with a well thought-out financial plan can soften the impact and ensure that you're set up to succeed. APEGA strives to make this process easy for Members, while also finding opportunities to reward Members for their dedication to advancing the professions.

As a result, APEGA has created a partnership with CIBC Wood Gundy, through which Members receive a 20 per cent discount on financial planning services. The markets can be unpredictable in Alberta, but with astute financial planning, Members can feel confident that their investments will weather the storms of economic uncertainty.

A GOOD EDUCATION

Even in difficult times, Members can set up future generations for success. A good education plays a huge role in a rewarding career trajectory, and passing that onto children is a goal of many parents. If you're looking for providers of Registered Education Savings Plans (RESPs), consider Heritage Education Funds. APEGA has brokered a deal with Heritage that features a cash-back reward for every child you enroll.

THE IMPORTANCE OF INSURANCE

A big part of financial planning is preparing for the unexpected. You need a financial cushion to weather the storms, and insurance is there to help. APEGA has worked hard at partnering with insurance companies that offer value to our Members. Through Engineers Canada, APEGA obtains special rates with TD Meloche Monnex for home and auto insurance, as well as Manulife Financial for life, disability, and extended health insurance. APEGA Members also receive discounts on pet insurance with Pet Secure through Engineers Canada.

APEGA offers many other benefits, including hospitality, car rentals, business flights, and cell phone plans — all of which can be accessed through APEGA's website or the Member Self-Service Centre (MSSC). If you have any questions or would like more information on whether you qualify for APEGA's Member benefits and how to obtain them, please email us at memberbenefits@apega.ca

Remember: practising Professional Members, Members-in-Training, ASAP student members, Life Members, and APEGA employees are all eligible for APEGA's Member benefits.

MEMBER BENEFITS

Eligible APEGA Members can take advantage of the following discounts. Complete details of these group benefits can be found at apega.ca under Member Benefits and Member Insurance. Due to seasonal or other limited-time promotions, the Member discount may not be the lowest price — you are advised to compare. APEGA does not hold any Member insurance profile or policy information.

To be eligible you must be of active status and good standing in at least one of the following APEGA classifications: Professional Member, Permit Holder, Member-in-Training, ASAP Student, Life Member, APEGA employee. Proof of eligibility may be required, such as your APEGA Member card, staff identification, or letter of eligibility from APEGA.

To inquire about these benefits, check your eligibility, or provide service feedback, please email memberbenefits@apega.ca.

TRAVEL

LocalHospitality — Local Hotel Deals Around the World

Hotel and car rental travel search engines

Below-market travel discounts. Up to 35% discount on pre-booked worldwide car rentals

Esso — **Fleet card**

Discounted rate of 3 cents/L, Esso extra rewards program

enterprise rent-a-car

5% off current national rates

National

10% off current national rates

red arrow safely home

10% discount value with valid APEGA member card

WESTJET

5% off regular rates (for BUSINESS only)

FINANCIAL

CIBC Wood Gundy

Financial Planning Services: 20% discount for APEGA members

HERITAGE

RESP investments — APEGA members receive $50 gift certificate per enrolled child

The Mortgage Centre — **www.wendymeier.ca**

A deposit of $250.00 to all APEGA members at closing

PERSONAL

imagewear a division of Mark's

10% off regular Mark's Work Wearhouse priced items

PROFESSIONAL EDGE Resumes

15% off on resume services

BUSINESS

CATALYST

10% discount on first year corporate support membership, for first-time members only

Capital Colour Printing

15% off graphic design/artwork; 10% off all offset and digital priting; 15% off all wide format printing (banners)

document management specialists dms360

10% off all project rates, 5% off SME rates

PULP

15% off illustrative services

Staples Advantage

Discounted prices on business products and services.

INSURANCE DISCOUNTS

Discounted rates for personal insurance with the following:

GA GARRETT AGENCIES

Manulife Financial

Petsecure pet health insurance

TD Insurance Meloche Monnex

Trouble Keeping Current?

Perhaps You Should Restore Your APEGA Connection

Under Canada's Anti-Spam Legislation (CASL), we require your express consent before we send you unsolicited email. If you have not given us consent, we've removed your address from our emailing list.

We respect your right to control the amount of email you receive. But we also want to get you the information you want and need to make the most of your membership. This is also a major part of APEGA's self-regulatory responsibility.

For these reasons, you can give us consent or update your subscription preferences at any time.

Three types of APEGA email are listed. You can checkmark any or all of them. And you can change your mind anytime — simply return to the website and change your options or click Unsubscribe.

Stay in the know. Visit consent.apega.ca today and select the email content that suits you.

SUBSCRIBE
consent.apega.ca

APEGA

IN MEMORIAM

The Association received notice of the deaths of the following Members between August 1 and October 31, 2015.

Life Members

AVERY, Leonard Wesley, P.Geoph.
BAEKELAND, Roger Ronald, P.Eng.
BIEBER, Garry Wilfred, P.Eng.
CULLEN, James Evendon, P.Eng.
KARPINSKI, Edward, P.Eng.
KOCH, Edwin Edward, P.Eng.
MAIER, Leonard Frederick, P.Eng.
MCCONNELL, Edward Walter, P.Eng.
MOTTRAM, Bob, P.L.(Eng.)
MULLIGAN, John Michael, P.Eng.
SNELL, Leslie Eric, P.Eng.
SPINNEY, Alden Clarke, P.Eng.
STEGHAUS, Hubert , P.Geol.
THORNE, Leonard Rosslyn, P.Eng.
WRIGHT, Patrick Lewis, P.Eng.

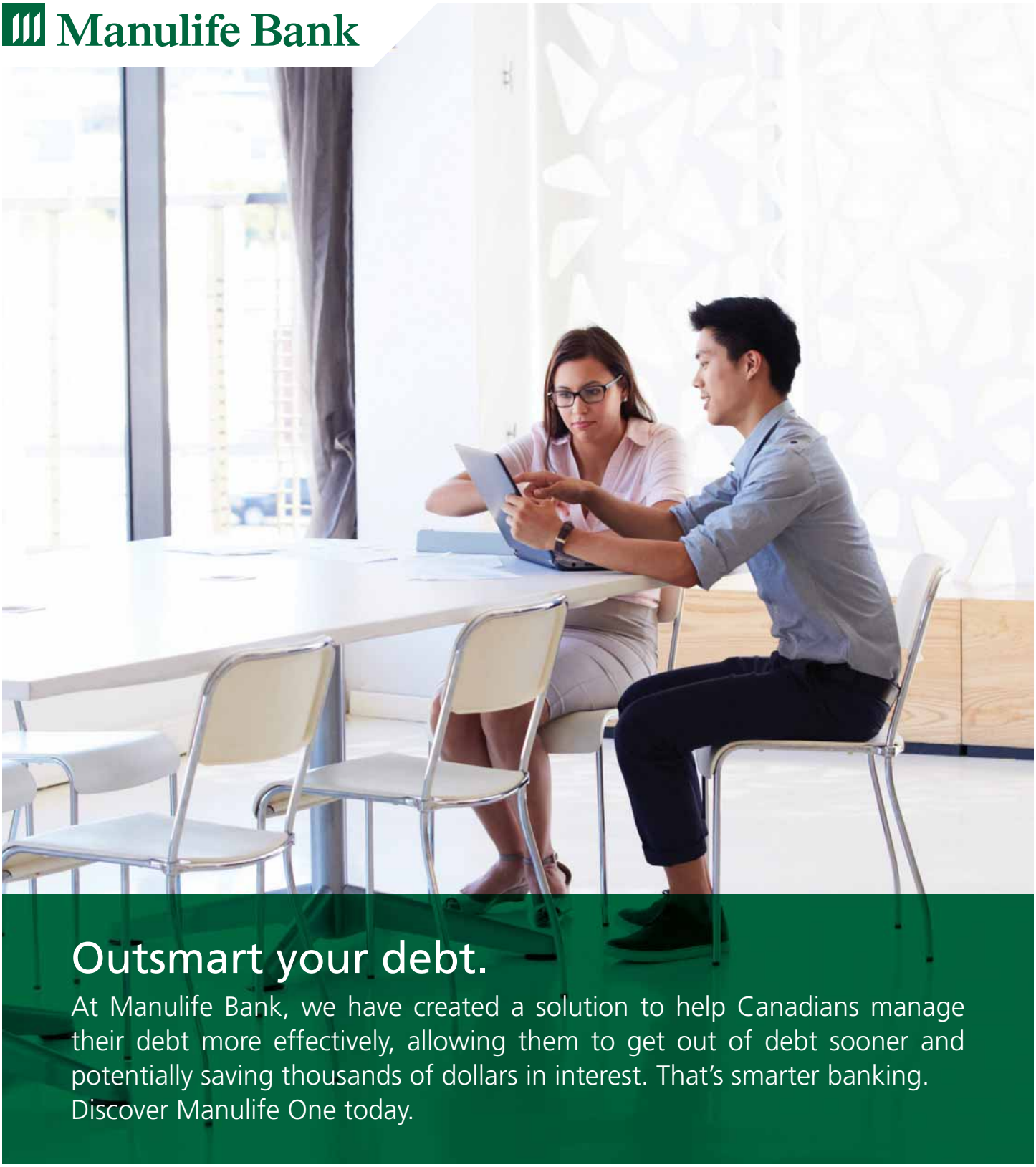
Professional Members

BASKERVILLE, Boe, P.Geol.
BENETTI, Jean ClaudE, P.Eng.
CAMPBELL, Thomas Scott, P.Eng.
DAWE, Merrick George, P.eng.
FONG, Yun Tong, P.Eng.
GU, Wei Kevin, P.Eng.
MESSIER, Margaret A, P.Eng.
PEACOCK, Harold Aylmer, P.Eng.

Members-In-Training

LEE, Victor Chun-Lok, E.I.T.

Manulife Bank



Outsmart your debt.

At Manulife Bank, we have created a solution to help Canadians manage their debt more effectively, allowing them to get out of debt sooner and potentially saving thousands of dollars in interest. That's smarter banking. Discover Manulife One today.

Sponsored by:
engineerscanada
ingénieurscanada

Visit **manulifeone.ca/engineerscanada** or call **1-877-765-2265** for more details on a special offer for Engineers.

LEARN. GROW. SUCCEED.

Founded 22 years ago, EPIC is a leading training solution provider of engineering and technology courses in Canada. More than 70,000 people – spanning different industries – have attended an EPIC course. Every course is designed and taught by a leading specialist in the field. Because we believe, to be the best – you need to learn from the best.

So register today at www.epictraining.ca/pegw16 and take the next step in your career.

EPIC Training Solutions

EPIC Alberta Classroom Training

There are several courses coming up in Alberta that will cater to all disciplines. Here are just a few:

Civil

- Structural Design of Industrial Buildings
- A Review of Urban Drainage and Stormwater Management Facility Designs

General & Construction

- Interpretation and Enforcement of Construction Contracts
- Fundamentals of Supervision and Management

Mechanical

- Boilers, Boiler Controls, Combustion and Steam System Efficiency
- Commissioning Process for HVAC Systems and Related Components
- Process Design and Engineering of Gas Processing Plants and Equipment

On-Site Training:

Looking for professional development for your employees? Choose from 130 courses or create a customized seminar based on your company's specific requirements. Plus, with on-site training you save time and travel expenses. For more information, please call 1.877.223.6919 ext 221 or email onsite@epictraining.ca

Webinars

EPIC's technical webinars are short and information packed courses with ideas you can immediately apply to your working skills. Here are just a few coming up soon:

Environmental

- Dealing with Facility Odour Issues
- Interpreting Air Dispersion Model Results
- Greenhouse Gases and Climate Change

General

- Social Media for Technical Professionals (including Facebook, Google+, Twitter, Linkedin)
- Are You fighting Fires Instead of Managing Your Employees?

✉ KEEP CURRENT

By joining our Email list, you can also stay up to date with all of our course offerings as well as technical articles, quick surveys and research papers. As a bonus, subscribers to the EPIC email list also have a chance to win an iPad. You can sign up at www.epictraining.ca/newsletter

EPIC

For more details about our upcoming courses in Alberta, please visit: www.epictraining.ca/pegw16 or call 1.877.223.6919.

LOOKING TO QUALIFY AS A CSA W47.1 WELDING ENGINEER?

Codes and Standards Training Institute **(CASTI)** is an approved educational institute for providing the required knowledge for qualification of Welding Engineers under CSA W47.1 clause 6.4.3.

By attending these CASTI courses, you could qualify. Visit our website at **www.casti.ca** to find out how.

Welding Fundamentals

February 23-26, 2016 in Calgary
September 8-11, 2016 in Edmonton

ASME Section IX Welding Codes & Metallurgy

April 5-8, 2016 in Edmonton
November 24-27, 2016 in Calgary

DID YOU KNOW: Canada-Alberta Job Grant for Employers

Employers can get up to two-thirds of training costs reimbursed to a maximum of $10,000 per employee per year, with up to $34 million available until March 2018.

This program is a great opportunity for employers to train employees to fill current and future positions and increase productivity, efficiency, and learn the job skills to help take the company to the next level. Advocate for the training you need to get ahead. Start the conversation with your employer today!

For more information, visit: http://www.albertacanada.com/opportunity/employers/jobgrant.aspx

CASTI
Codes and Standards Training Institute

CASTI | Suite 205, 10544 106 Street
Edmonton, AB | tel. 780.424.2552
e. training@casti.ca | www.casti.ca