THE PROFESSIONAL

EDGE

ISSUE 160 JANUARY/FEBRUARY 2016

PROFILES IN ACHIEVEMENT

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Achieving a Safe and Prosperous Future through Engineering and Geoscience

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Opinions expressed in signed contributions are those of the individual authors only, and the Association accepts no responsibility for them. The Association reserves the right to make the usual editorial changes in manuscripts accepted for publication, including such revisions as are necessary to ensure correctness of grammar and spelling. The Association also reserves the right to refuse or withdraw acceptance from or delay publication of any manuscript. SSN 0841-6427

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POSTMASTER

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Submission Deadlines

MARCH/APRIL 2016: March 1, 2016 **MAY/JUNE 2016:** May 1, 2016

Subscription Rates*

Members and Licensees - Free. Others in Saskatchewan - $12/year. Elsewhere - $20/year.

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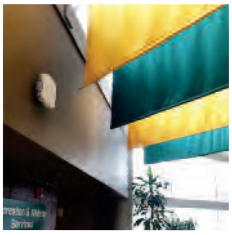



PROFILES IN ACHIEVEMENT

86th

Annual Meeting and Professional Development Conference

Evolving Professionals

May 5-7, 2016
Delta Bessborough Saskatoon SK

President's Report

"Never miss an opportunity to be fabulous."

That's the advice that neuroscientist Tina Seelig, Ph.D. gives her engineering students at Stanford University. It's a way of giving yourself permission to do your very best. It's timely advice because this is our annual achievements issue of *The Edge*, as APEGS celebrates exciting Saskatchewan projects from 2015.

Tina Seelig teaches creativity, innovation and entrepreneurship, which raises the question: "Can these abilities really be taught?" Yes! Many engineering faculties at universities are focusing on just this.

At Engineers Nova Scotia's annual meeting this past fall, one of the professional development sessions was dedicated to the Innovative Design and Entrepreneurship Academy (IDEA) Sandbox, which will bring together students, industry professionals and resources to create student-led start-up businesses, a venture co-funded by Dalhousie's Faculty of Engineering.

During the Pacific Northwest Economic Region (PNWER) Summer Summit, delegates toured Montana State University's research and economic development department, led by Renee Reijo Pera, Ph.D., vice-president for research, creativity and technology transfer. And of course our own University of Saskatchewan offers engineering students an engineering entrepreneurship option to their Bachelor of Science in Engineering degree through the Graham School of Professional Development.

What are some of the lessons to be learned about creativity and innovation? While there are many (and we all know them already to some degree), my favourites remind us that:

1) There are opportunities everywhere. Why? Because there are problems waiting to be solved everywhere. To find the solutions and create value (when others do not see it) we may need to redefine the problem, as so often problems are too narrowly defined, leading us into the trap of only standard solutions or, worse, the belief there is no solution at all.

A classic example: 5+5=? has one answer, but ?+?=10 has an infinite number of answers.

By turning the problem around, we can start to think creatively, leveraging the limited resources around us to reach our goals.

2) The sweet spot in life occurs where passion overlaps with your skills and a market need. When speaking to students about why I decided to pursue engineering, I reflect on my influences, including my own interest in science, my parents and the professional people around me who had ideas and opinions and were engaged in the world around them. To me, that was passion and that's what I wanted out of my life and career. As professionals, we are more likely to have the education, opportunity and control in our life to find that satisfaction.

3) Nike has been right about life all along: "Just Do It." Doing is what matters in life. Whining and complaining get you nowhere—things only happen when you act. I have been reading a great deal about women's leadership. A key component is confidence, and studies show that confidence is built by taking action and learning from both the successes and setbacks (failures).

APEGS is an organization that takes action. This is hardly a surprise, since we are part of a culture of people known for taking action, just like "The Little Engine that Could." Saskatchewan organizations, businesses and leaders are willing to put themselves forward and take a position by acting locally, nationally and internationally.

Some of the many APEGS achievements this past year include:

- registering over 1,000 new members
- endorsing Engineers Canada's 30-by-30 initiative
- improving the Academic Review Committee processes
- making our annual donation to the university libraries
- implementing the APEGS Value Proposition (AVP) Initiatives and Action Register
- publishing the first e-Edge issue
- creating the Members' Benefits brochure
- hosting our annual Volunteer Appreciation Event
- providing funding for the regional constituent societies
- funding student development projects
- funding the 2015 Saskatchewan Geological Society open house and public lecture
- meeting with MPs on Parliament Hill and Saskatchewan MLAs
- holding Council meetings with our Past Presidents
- endorsing World Education Services' degree-by-degree International Credential Advantage package assessment for the registration requirement for internationally educated engineers, donating to the Canadian Engineering Memorial Foundation for the Marie Carter Scholarship and much more!

So as you plan your New Year's resolutions, think about adding some of the teaching principles around creativity, innovation, and entrepreneurship. And all the best for a happy, healthy, safe, and prosperous 2016!

PROFILES IN ACHIEVEMENT

Engineering and Geoscience Projects






Usually our job at *The Professional Edge* is telling Saskatchewan engineering and geoscience stories to APEGS members. This month we're turning the tables. We invited APEGS members to send us pictures and descriptions of their proudest achievements from 2015.

We want to thank the contributors to this special feature. For those of you who didn't contribute this year, we will be doing this again next year, so keep your cameras handy to capture your 2016 engineering or geoscience **success stories.**

2015

Launch of SaskTel's Integrated Business Communications (IBC) Service

The Company:

SaskTel is the leading information and communications technology (ICT) provider in Saskatchewan, with over $1.2 billion in annual revenue and over 1.4 million customer connections. SaskTel and its wholly owned subsidiaries have a workforce of approximately 4,000 full-time equivalent employees (FTEs). Visit SaskTel at www.sasktel.com.

The Achievement:

SaskTel launched Integrated Business Communications (IBC) service which is a hosted unified communications solution for business customers. It allows users to connect, communicate and collaborate from anywhere on any device.

The SaskTel IBC delivers unified communications capabilities to desktop computers, desk-based phones, laptops, tablets and mobile phones. The service includes a range of voice, instant messaging and presence applications – allowing users to make and receive business calls anywhere with Internet access as well as to configure their SaskTel IBC services.

This is the first service to use SaskTel's Internet Protocol Multimedia Subsystem (IMS) solution. IMS is an industry standard architecture for distributing IP multimedia services such as messaging, voice and video.

SaskTel's deployment of the IMS system required the integration of several vendors' technologies. Due to the complex nature of this system, the design team was required to find unique solutions to overcome the many challenges. Significant design and integration effort was required to enable the support of clients for several devices including desktop computers and mobile phones.

The IMS network provides SaskTel the ability to deploy converged service for business, residential and wireless customers.

The Team:

The SaskTel design and project team working on the IBC project included a number of APEGS members, engineers-in-training and engineering assistants from the technology management departments working with Marketing and Information Systems.

Regina bypass breaks ground

The Companies:

Graham Construction, Parsons Canada, Carmacks Enterprises and Vinci Canada have partnered with the Government of Saskatchewan and SaskBuilds to design, build, operate and maintain the Regina Bypass project.

Graham is one of the largest construction companies in Canada and has a 90-year history in Saskatchewan. Parsons Canada is a regional business unit of Parsons that offers international engineering, construction, technical, and professional services.

Carmacks Enterprises is a general construction service and highway maintenance organization handling all aspects of heavy civil construction.

Vinci Canada is a global player in infrastructure concessions and construction, and has been in operation for over 60 years.

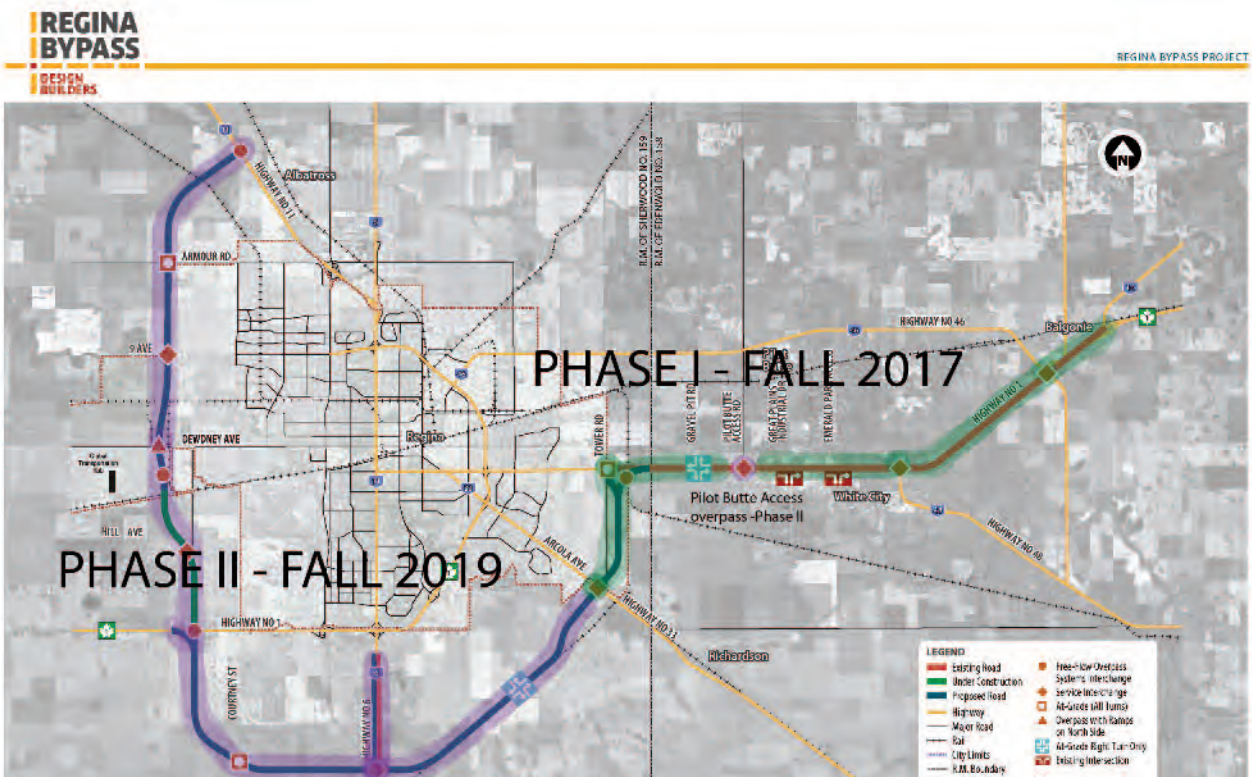
The Achievement:

Construction on Regina's bypass officially began during the summer of 2015. Billed at $1.88 billion, the bypass is the largest transportation infrastructure project in Saskatchewan's history. First approved in June 2013, the goal of the project is to lessen congestion within the City of Regina and on Ring Road. The route goes west and south of the city, reconnecting with Highway 1 on the east side at Tower Road.

The entire project is scheduled to be completed in 2019, though four overpasses in the east end are expected to be ready in 2017. The Regina bypass is a public-private partnership, financed with public money, but designed, built, operated, and maintained by a group of private companies over a 30-year period.

The Team:

There are currently over 20 engineers working on the bypass project, but over the course of the procurement, design and construction there will be 157 engineers and 22 engineering firms across North America working on the project in varying degrees, including 45 engineers employed by the Ministry of Highways. These numbers do not include the many engineers that have helped to evaluate and review options for the Regina bypass between 2003 and 2012, as well as the engineers employed by the utility companies involved.



Saskatoon Light & Power makes meters smart

The Company:

Founded in 1906, Saskatoon Light & Power maintains the City of Saskatoon's street light system and provides electrical service to 59,000 properties within the 1958 city boundary. SL&P purchases power in bulk from SaskPower, providing electricity to about 117,200 Saskatoon residents.

The Achievement:

With the installation of data collection devices this year, Saskatoon Light & Power has entered a new phase of its smart meter system. Starting in 2008, SL&P began replacing older style mechanical meters with new electronic meters, and has since replaced about 60 per cent of its 60,000 meters, with the goal of having all meters replaced by the end of 2017.

In 2015 and continuing into 2016, SL&P has begun installing of the Advanced Metering Infrastructure system, which will provide the network to communicate with the meters, making the meters "smart," and allowing remote meter reading and the ability to base bills on actual usage instead of estimates. The new billing system will come into effect in 2016.

Kevin Hudson, P.Eng., SL&P's metering and sustainable electricity manager, says the installation and operation of the smart meter system will cost $46 million but will result in a savings of $76 million over 20 years.

The Team:

The project team involved several staff from Saskatoon Light & Power, Saskatoon Water, Corporate Revenue, Information Technology and consultant Util-Assist Inc. from Burlington, Ont. Key staff included professional engineers Moussa Fadlelmawla, P.Eng. with Saskatoon Light & Power, Ross Elliott, P.Eng. with Saskatoon Water, and Kevin Hudson, P.Eng., SL&P's metering and sustainable electricity manager and the project manager for the smart meter program.

Queen Elizabeth Power Station expansion goes live

The Company:

SaskPower is the principal supplier of electricity in Saskatchewan, serving more than 490,000 customers and managing $7 billion in assets. The company operates three coal-fired power stations, seven hydroelectric stations, six natural gas stations, two wind facilities and manages purchase agreements with several alternative energy suppliers.

The Achievement:

SaskPower completed its two-year, $525 million expansion of Saskatoon's Queen Elizabeth Power Station in October 2015.

The project adds 204 megawatts of capacity, or enough electricity to power more than 200,000 additional homes. With the expansion, the natural gas facility becomes the number one generating source in the province. The project involved converting three gas turbines from simple-cycle to combined-cycle, which delivers a 10-15 per cent increase in efficiency.

A simple-cycle gas turbine generates electricity by using hot gas produced during the combustion process to turn a turbine. A combined-cycle turbine uses the excess heat from the combustion turbine exhaust to create steam to power a secondary steam turbine generator.

This newest addition adds to upgrades that were completed in 1971, 2002 and 2009. Natural gas-based power produces less than half of the greenhouse gas emissions of conventional coal, and because it can provide power 24/7, it can be put into service more quickly than other options in order to meet rising power demands.

The Team:

Since the project first broke ground in 2013, well over 100 APEGS members have been involved with the project, including engineers from SaskPower and external consulting and construction firms.

SaskTel - University of Regina - Huawei Lampsite Trial

The Company:

SaskTel is the leading information and communications technology (ICT) provider in Saskatchewan, with over $1.2 billion in annual revenue and over 1.4 million customer connections.

SaskTel and its wholly owned subsidiaries offer a wide range of ICT products and services including competitive voice, data and Internet services, wireless data services, maxTV services, data centre services, cloud-based services, security monitoring services, advertising services and international software and consulting services. SaskTel and its wholly owned subsidiaries have a workforce of approximately 4,000 employees.

The Achievement:

Demand for wireless connectivity and data is expected to continue to grow significantly for the foreseeable future. With that in mind, the University of Regina and SaskTel created a working partnership with the Faculty of Engineering (Electronic Systems Engineering program) to deploy and test different types of wireless network technology by SaskTel on the University of Regina campus.

SaskTel is pursuing a Heterogeneous Network (Het-Net) Architecture at the University of Regina Campus to test new ways of deploying small cell architecture. The "Het-Net" architecture consists of a variety of technologies, frequency bands and cell sizes in various locations that work together to deliver high-quality user experience.

SaskTel was responsible for choosing the wireless technology to be used on campus and chose the Huawei Multi-Band Multi-Technology Lampsite product. SaskTel, in partnership with the University of Regina and Huawei, was responsible for defining design criteria and identifying technical requirements for the design.

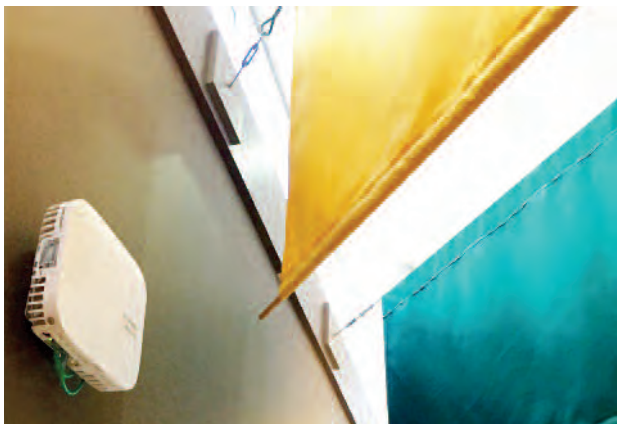
The partnership with the University of Regina allowed for the engagement of engineering faculty and graduate students through all phases of the project, from the design phase right through implementation, acceptance and then the ongoing optimization. This has allowed an opportunity to study, test and analyze measurable objectives during all phases.

This mentorship opportunity with the SaskTel Wireless Engineering Group also included research on wireless modelling (specifically in a campus environment), access to planning, design and implementation tools, and facilitated initial design work to perfect the design. Going forward, SaskTel, in partnership with University of Regina faculty, will identify conceptual research topics to engage students further in engineering and other disciplines.

Not only is the partnership to involve students unique, the newly launched Huawei Lampsite product is the first commercial trial in North America.

The Team:

The University of Regina/SaskTel partnership was led by Dr. Paranjape, P.Eng. and his graduate engineering students as well as SaskTel's Wireless Access Engineering, Wireless RAN Support and Technology Management Groups.



Cameco celebrates a year of production at Cigar Lake

The Company:

Based in Saskatoon, Cameco is the world's largest publicly traded uranium company and the third-largest uranium producer. It controls some of the world's largest high-grade reserves, including Cigar Lake, the world's largest undeveloped high-grade uranium deposit.

The Achievement:

In September 2015, Cameco celebrated a year of production at Cigar Lake. Discovered in 1981, the Cigar Lake uranium deposit is one of the world's largest and is one of the most technically challenging to mine. Construction started in 2005 but the project flooded in 2006 and 2008 causing delays. Production officially began in March 2014. The mine reached its initial 2015 production target during the third quarter and surpassed 10 million pounds of uranium concentrate by December 2015.

Ore from Cigar Lake is removed using machines that inject water at high pressure to cut away the rock and create an ore slurry that is collected through pipes and pumped to surface. The ore is then transported 70 kilometres to the McClean Lake mill for processing.

The Team:

Since its discovery in 1981, thousands of people have worked on the Cigar Lake project, including many professional engineers. Today 75 APEGS members are employed at Cigar Lake or as part of the major projects divisions that worked on the mine.

Hybrid Energy Container (HERC) Power System

The Institution:

The Saskatchewan Research Council (SRC) is one of Canada's leading providers of applied research, development and demonstration (RD&D), and technology commercialization. With more than 350 employees, $73 million in annual revenue and 69 years of RD&D experience, SRC provides services and products to its 1,500 clients in 20 countries around the world.

The Achievement:

There are several off-grid communities and industrial sites in Saskatchewan and Canada that use diesel generators to meet their electrical power needs. A diesel generator, by principle, follows the electrical load, which leads to inefficiencies as the engine operates outside of its optimal range. This results in excessive fuel consumption, increased pollution and more frequent maintenance.

SRC's Hybrid Energy Container (HERC) Power System is a single modular container consisting of a diesel generator, a battery, a photovoltaic array and an inverter system equipped with remote control and monitoring systems. By using both conventional and renewable energy sources (solar and/or wind) with energy storage, HERC is more efficient, cost-effective and environmentally friendly than traditional diesel generators.

Its rugged construction and container design is mobile, using conventional transportation methods. The insulated system has its own heating, ventilation and air-conditioning system, allowing for reliable operation in extreme climates.

SRC specializes in developing these custom-built units based on actual site operational data. This ensures that clients maximize the benefits of the system for the lowest cost.

The HERC system was demonstrated at a remote mine remediation site near Uranium City in the summer of 2015, and decreased the diesel fuel consumption of the site by 86 per cent. In addition to fuel savings, the HERC reduced generator runtime by approximately 70 per cent, thereby providing additional generator maintenance savings, extended generator lifetime and reduced noise at site.

The Team:

The project is currently being completed by Ryan Jansen, P. Eng., Anton Farber, Engineer-In-Training, David Williams, Engineer-In-Training, Graham Epp, Engineer-In-Training, Michael Sulatisky, P. Eng., along with numerous other technologists and specialists.

Member Profile

This month *The Professional Edge* chats with Lyndon Graff, P.Eng., a mechanical engineer working for Brandt Agricultural Products in Regina.

Tell us about your personal and professional background.

There's not too much to tell. I grew up on a farm outside of Neudorf, where I went to school. After high school, I went on to study agricultural and bioresource engineering at the University of Saskatchewan.

Why did you choose to go into engineering?

I've always been interested in math and science. Growing up, I always liked to experiment and to work with my hands. I was also very interested in agriculture so I figured agricultural engineering would be a good way to combine those interests.

What was your first job after college?

Brandt! It was my first position after college and, six years later, it's still my first job.

I really enjoy working here. It has been the fulfillment of my dream of doing both engineering and agriculture. As well, my work schedule at the company allows me to stay involved with my own farm back in Neudorf.

What sort of thing do you work on?

I'm one of the designers for a range of agricultural equipment. At the moment I've been particularly involved in designing our belt conveyor products.

But a great thing about working at Brandt is that we get a taste of the whole scope of production right up to customer service and quality control.

What do you feel was your single greatest accomplishment as an engineer?

That's a tough one. I'd have to say that I'm proud of my whole body of work at Brandt. It's a team effort so there isn't one particular product I designed by myself. Even so, it's a great feeling to drive down the highway, see a piece of farm equipment out in the field and think "I was a part of creating that machine."

What are your interests outside of work?

My great passion outside of work is music. I play with the Queen City Brass Band and sing in the Regina Philharmonic Chorus. In school, I took piano and voice lessons, and took part in Royal Conservatory testing. In university as well I took part in a few extracurricular choirs and bands.

Do you think there is a connection between your music and engineering?

Yes, definitely. Both involve attention to detail. They are both technical and creative at the same time. So the two disciplines complement each other quite well.

What is your favourite vacation spot?

We've traveled a few times to the east coast – to the Maritimes in Canada and to New England. I enjoy the ocean and the different culture. The people there are amazing – they are so friendly and they know how to have a good time.

What is your favourite book / book you are reading now?

I just finished reading *The Martian* and I'm looking forward to the movie. As it happens, I was in Florida just a few weeks ago and saw the Kennedy Space Center for first time so it fit into the whole experience of reading the book.

If you could have any superpower, what would it be?

I'd like to have unlimited energy with no need to sleep. There never seem to be enough hours in the day to do all the things I want.

Who has had the greatest influence on your life and career?

For my life, I'd definitely say my dad. He is a great role model. He is intelligent and hard-working but down-to-earth. I'm in awe of everything he has accomplished with his farm and in the community.

As for my career, I've been lucky to have many mentors here at Brandt, but my most important mentor was my master's supervisor, Dr. Trever Crowe, P.Eng. He taught me the importance of detail and thinking through a problem before getting into the solution. In many cases, the biggest challenge in engineering is how you understand and communicate that solution. That insight has been a big benefit to my career.

Report on the Professional Practice Exam - 2015

BY SHAWNA L. ARGUE, P.ENG., FEC, FCSSE, FGC(HON) – APEGS DIRECTOR OF EDUCATION AND COMPLIANCE

The Professional Practice Exam was written by 344 candidates in 2015, an increase of 11 examinees over 2014.

	MAY 30	OCT 31
# CANDIDATES	191	153
Highest (%)	92.5	94.5
Average (%)	77.5	77.8

	MAY 30	OCT 31
# FAILURES *	2	3

** The grade required to pass the exam is 65%.*

2016 Law & Ethics Seminar and Exam Dates

Spring 2016

- **Friday, March 18, 2016**
  Registration deadline for spring exam and seminar AND deadline for submission of post-bachelor's work experience report (if none submitted previously). This is also the last day to cancel seminar and/or exam (reapplication would be required).

- **Friday and Saturday, April 15-16, 2016**
  Law and Ethics Seminar (Saskatoon)

- **Saturday, May 28, 2016**
  Professional Practice Examination (Regina and Saskatoon)

Fall 2016

- **Friday, August 12, 2016**
  Registration deadline for fall exam and seminar AND deadline for submission of post-bachelor's work experience report (if none submitted previously). This is also the last day to cancel seminar and/or exam if you had applied for the fall 2014 exam previously (reapplication would be required).

- **Friday and Saturday, September 9-10, 2016**
  Law and Ethics Seminar (Regina)

- **Saturday, October 22, 2016**
  Professional Practice Examination (Regina and Saskatoon)

  The seminar runs from 9:00 a.m. to 7:30 p.m. on Friday and 8:30 a.m. to approximately 4:00 pm on Saturday. Complete exam information, including the application form and how to order textbooks, can be found at www.apegs.ca under Apply, Professional Practice Exam.

COUNCIL NOTES

Dec. 3, 2015 – Saskatchewan Science Centre, Regina, SK
Dec. 4, 2015 – Hotel Saskatchewan, Regina, SK
17 of 19 Councillors present

- Council approved the Association's 2016 budget.
- Council approved the recommendation from the Governance Board that APEGS participate in the Canadian experience pilot project of APEGBC by allowing up to two APEGS applicants to participate, provided that they are subject to experience review against the current Canadian experience requirement.
- The Governance Board reported the following appointments: Kevin Ansdell P.Geo., FEC (Hon.), FGC to the Academic Review Committee for a three-year term; Cheryl Robertson, P.Eng. as Vice-Chair of the Professional Practice Exam Committee for a two-year term.
- Council approved adoption of the addition to the Academic Review Committee bypass policy in AR3.0, subject to Academic Review Committee approval of the clarifications in wording.
- The proposed changes, as recommended by the Registrar's Advisory Committee, to Council policy Reg1.0 were approved by Council.
- The terms of reference of the Registrar's Advisory Committee were amended to require a simple majority of the committee for quorum.
- Council approved Life Membership for Kenneth P.L. Kwan, P.Eng. and Vijay K. Sarna, P.Eng.
- The Image and Identity Board reported the following appointments: Bryan Schreiner, P.Eng., P.Geo., FEC, FGC as Vice-Chair of the Awards Committee for a two-year term and Dawn Friesen, P.Eng. as Vice-Chair of the Equity and Diversity Committee for a two-year term.
- On the recommendation of the Connection and Involvement Committee, funding to all the active constituent societies for 2015 was approved by the Image and Identity Board.
- The Professional Edge Committee reported a successful pilot the e-Edge with the Sept/Oct 2015 issue and recommends proceeding with the e-Edge for 2016.
- The Education Board reported the following appointments: Ben Boots, P.Eng., FEC as Vice-Chair of the Education Board; Sebastian Walrond, P.Eng. as Vice-Chair of the Professional Development Committee for the remainder of the 2015-2016 term; Stephanie Campbell, P.Eng., to the Student Development Committee for a second three-year term; Jason Whitelaw, Engineer-in-Training and Colin Pitman, Engineer-in-Training to the Student Development Committee for a three-year term, Jason Whitelaw to serve as secretary; Rajesh Shah, P.Eng. to the K-12 Committee for a third two-year term and Andrew Bowerman, P.Eng. to the K-12 Committee for a three-year term; Ian Loughran, P.Eng. to the Environment and Sustainability Committee for a three-year term.

The next Council meeting is scheduled for February 4-5, 2016 in Saskatoon.

86th Annual Meeting and Professional Development Conference

Evolving Professionals

May 5 - 7, 2016
Delta Bessborough Saskatoon SK

Event Schedule

Thursday May 5

Welcome Event and Public Lecture	6:00 - 10:00 pm

Friday May 6

Buffet Breakfast	7:30 - 9:00 am
Professional Development Streams	8:30 am - 12:00 pm 2:00 pm - 4:30 pm
Tours	9:30 - 11:30 am 2:30 - 4:30 pm
Professional Development Luncheon	12:00 - 2:00 pm
Past Presidents' / Council Meeting	3:00 - 4:00 pm
Past Presidents' Dinner & Presidents' Reception	5:30 - 11:00 pm

Saturday May 7

Buffet Breakfast	7:30 - 9:00 am
Annual Meeting	8:30 - 9:00 am (Registration) 9:00 am - 12:30 pm
Youth Science Day	9:00 am - 4:00 pm
Partners' Program	10:00 am - 3:00 pm
Recognition Luncheon	12:30 - 2:30 pm
Committee Meetings	2:30 - 4:30 pm
Awards Banquet	6:00 pm – Reception 7:00 pm - Banquet

Social Events

Thursday May 5

- **Welcome Event - Come and go reception**
- **Pulblic lecture - University of Saskatchewan Space Design Team**

Friday May 6

- **Buffet Breakfast**
- **Professional Development Luncheon**
- **Keynote address from Jesse Hirsh**
- **Past Presidents Dinner & Presidents' Reception**
  This dinner and reception in honour of APEGS past Presidents is a wonderful opportunity to gather and socialize.

Saturday May 7

- **Buffet Breakfast**
- **Partners' Program**
  Activities and networking for the companions of the business meeting attendees.
- **Recognition Luncheon**
  This luncheon will acknowledge our new professional members and recognize the many volunteers who contribute their time and talents to the Association.
- **Awards Banquet**
  Saturday evening we celebrate members whose outstanding achievements and contributions have earned them the recognition and respect of their peers.
- **Hospitality Suite**

Keynote Speaker

At the 2016 APEGS Annual Meeting, we are honoured to welcome special guest Jesse Hirsh.

Jesse Hirsh is an Internet strategist, researcher and broadcaster based in Toronto. He has a weekly nationally syndicated column on CBC radio explaining and analyzing the latest trends and developments in technology, using language and examples that are meaningful and relevant to everyday life.

He owns and operates Metaviews Media Management Ltd., which focuses on research and consulting around new media business models, big data and the strategic use of social media. He is also a co-founder of the Academy of the Impossible, a peer-to-peer life long learning facility.

For two years, he was the host of an interfaith show on the Rogers and OMNI networks called *3D Dialogue*. That show explored all the world's religions and spiritual paths through interviews with practitioners, gurus, holy people and cynics regarding their rituals, scriptures and beliefs (or lack thereof).

Educated at the McLuhan Program at the University of Toronto, his passion is educating people on the potential benefits and perils of technology.

Business Meeting **Saturday May 7**

The 86th Annual Meeting of the Association will be called to order at 9:00 am. Members must register between 8:30 - 9:00 am to obtain a voting card.

The agenda will include:

- Minutes of the last Annual Meeting
- Business arising out of the minutes
- Report of committees
- Audited financial report
- New business
- Report of the scrutineers

MLA Reception

APEGS held its 15th annual MLA Reception on Wednesday November 25, 2015 in Regina. The reception provides an opportunity for all MLAs to meet with members of the Association including Council, Past Presidents and committee chairs. A variety of issues related to the engineering and geoscience professions were discussed in an informal setting.

A family affair: Ashley Ransom (nee Forbes), P.Eng., FEC, Richard Forbes, P.Eng., FEC, FGC (Hon.), David Forbes, Saskatoon Centre

BELOW LEFT:
Leader of the Opposition Cam Broten

BELOW RIGHT:
Larry Doke, Cut Knife-Turtleford

LEFT:
APEGS President Margaret Anne Hodges, P.Eng., FEC presided over a short program which included greetings from Larry Doke, Cut Knife-Turtleford and Cam Broten, Leader of the Opposition. APEGS would like to thank the MLAs for attending this event and the volunteers for helping to make the event a success.

BACK BY POPULAR DEMAND!

Professional Development Opportunity

APEGS is pleased to offer a Continuing Professional Excellence opportunity for technical professionals.

Get to the Point!

A Two-Day Practical Writing Course for Technical Professionals

This highly interactive two day session is designed for technical professionals who write reports, emails, letters and proposals, and want to write them more efficiently and present their information more effectively. **Sharpen your personal writing style to create a strong and effective presence.** There will be individual and group practice exercises, with lots of discussion and feedback.

This course has sold out each time we have offered it!

The student feedback has been outstanding.
100% of the participants rated the course overall as EXCELLENT.

May 4-5, 2016 (8 a.m. to 5 p.m.)
Saskatoon Club, 417 21st St. E., Saskatoon, SK
The registration fee is $1,100.00 (plus GST)
Continental breakfast, refreshments during breaks and lunches are included in the fee.

Register on-line at **www.apegsservices.ca/meetings**

For more information, contact
Shawna Argue, APEGS Director of Education and Compliance at:
306.525.9547 or toll free 1.800.500.9547;
Email: sargue@apegs.ca

Call For Council Nominations

Nominating Committee

The Nominating Committee, chaired by Past President Andrew Loken, P.Eng., FEC, is soliciting names for the positions described below. You may contact staff support to the Nominating Committee, Bob McDonald, at rhmcdonald@apegs.ca to propose the names of potential candidates. Bob may also be reached through the APEGS office in Regina by phone at 306. 525.9547 (toll free 1.800.500.9547 North America), or facsimile 306.525.0851.

The Bylaws require the Nominating Committee to nominate, whenever possible, for President the person holding the office of President-Elect, and one person for the position of President-Elect (typically the person holding the office of Vice- President). Tara Zrymiak, P.Eng., FEC is the current President-Elect and Ernie Barber, P.Eng., P.Ag. is the current Vice-President. The Nominating Committee is also required to nominate, whenever possible, at least two persons for Vice-President and at least two persons for each vacancy on the Council.

Submission of Nominations

Any five members may nominate over their signatures an eligible nominee for any elective office except that of President. Such nominations shall be in the hands of the Registrar at least forty-five days before the election is to take place. To meet this requirement, the nominations must be in the APEGS office no later than 5 p.m., Thursday, March 17, 2016, as the election will take place when ballots are counted on Monday, May 2, 2016, the "polling day."

2016 Vacancies & Terms of Office

Officers

- President-Elect – one-year term
- Vice-President – one-year term

Group and Electoral District Councillors to serve three-year term

- Group I (Civil)
- Group III (Electrical and Engineering Physics)
- Group IV (Geological, Mining, Petroleum, Geophysics and Geoscientists)
- Group VII (Environmental)

Eligibility for Nomination

- Only members in good standing are eligible for nomination. A person elected to Council may only hold office while a resident of Saskatchewan.
- A person nominated for President-Elect must have served at least one full year (i.e. from the close of business at one annual meeting to the close of business at the next annual meeting) as a member of APEGS Council prior to the date on which they would assume office as President-Elect.
- A person who is nominated as a representative of an electoral group must be classified with the association in that electoral group. The Councillor representing Members-in-Training can complete the term of office after obtaining his or her P.Eng. or P.Geo. status.

Celebrating Our Own

Two Fellowships from The Canadian Society for Senior Engineers (CSSE) were presented at the APEGS Past Presidents' Dinner held Thursday October 8, 2015 at the Delta Bessborough in Saskatoon.

RIGHT: Robert H. McDonald, P.Eng., FEC, FGC (Hon.), FCSSE was awarded the Canadian Society for Senior Engineers (CSSE) Fellowship from CSSE Director Pieter Van Vliet.

ABOVE: Dr. Karim W. Nasser, P.Eng., FCSSE was awarded the Canadian Society for Senior Engineers (CSSE) Fellowship from CSSE Director Pieter Van Vliet.

College Corner

The Faculty of Engineering and Applied Science has experienced tremendous growth over the past three years. With roughly 1350 undergraduate students we are now one of the largest faculties at the University of Regina. This growth has enabled us to both maintain and increase our faculty needs. In September we had four new professors join the faculty. We are pleased to welcome Dr. Abdul Bais and Dr. Irfan Al-Anbagi in Electronics Systems Engineering, Dr. Peng Wu in Environmental Systems Engineering, and Dr. Wei Peng in Engineering General.

The Regina Engineering Students' Society established a ceremony to promote and encourage ethical behavior in students. The inaugural Honour Pin Ceremony was held on September 18, 2015. This ceremony will be an annual event in the fall when new first year students join the faculty.

Project Day 2016 will be held on Saturday, April 9, in the Education Building. This event celebrates the achievements of our graduating class. Roughly 80 capstone design projects will be presented throughout the day in the fields of Electronics, Environmental, Industrial, Petroleum, and Software Systems Engineering. The public is welcome to come and see the projects and meet with the students. Free parking is available on campus all day long.

The University of Regina will be hosting the 2017 Canada Wide Science Fair from May 14-20, 2017. Close to 700 students from across Canada in Grades 7 – 12 will come to Regina to present their science and engineering projects. This is a remarkable event that recognizes the achievements of very talented students. Some of the projects from the event last year in Fredericton were at a master's degree level! If you are interested in getting involved, please contact Dr. Pierre-Philippe Ouimet (pierre-philippe.ouimet@uregina.ca). There is a large need for volunteers, especially bilingual judges. You can learn more about the Canada Wide Science Fair at http://cwsf.youthscience.ca.

Correction Notice

In the last issue of *The Professional Edge*, in the ACEC-SK awards announcements, Chelsey Bartlett's employer was mistakenly reported as Clifton Associates. Below is the corrected announcement:

ACEC-SK 2015 Young Professional Award, Chelsey Bartlett, P. Eng., Golder Associates Ltd.

Photo (l to r): Chelsey Bartlett, P. Eng., accepts the association's Young Professional Award from ACEC-SK Vice Chair, Jeff Halliday, P.Eng.

Call to Action on Climate Change

A Message from the Environment and Sustainability Committee

BY KEVIN HUDSON, P.ENG.

Energy makes the world go around. Society depends on it for our very survival. We use it to treat and pump our water, to cook and preserve our food, to operate vital healthcare systems, to heat our homes and power our lives, and to transport goods and people where they need to be. Energy fuels the global economy, and as the global population continues to grow, so too will the demand for ever-increasing supplies. Engineers and geoscientists play a vital role to help ensure that a safe, affordable and reliable supply of energy is available to people around the world.

We did not always have energy in the abundant and convenient forms that we do today, but it has always been fundamental to our survival. Through the work of engineers and geoscientists, we have developed more sophisticated and powerful ways to produce and use energy, available at the flick of a switch or by cracking a valve. In many cases, the use of energy has become so automated that few people even know or care where it comes from, unless it is not there when they want it. As we consume energy at an ever-increasing rate, few people bother to think about how long it will last or the consequences of its use to future generations.

For many consumers, the primary consideration in choosing where their energy comes from is affordability – after all, if you cannot make ends meet at the end of the month, something has to give. Governments and industry leaders however, must also consider the environmental and social aspects of energy use, such as the unwanted emissions it creates and its availability to future generations.

If greenhouse gas emissions resulting from energy use lead to climate change and global warming, then in the coming years countries around the world may face challenges never before experienced. If we fail to take action now to mitigate climate change, then food shortages, drought, scarcity of water and energy supplies, extreme weather events, crumbling infrastructure and choking air pollution could become commonplace for future generations.

In late 2015, political leaders and scientists from 195 countries gathered in Paris, France for the twenty-first United Nation's Conference of Parties to discuss the changing climate. The conference ended with a call to action for countries to commit to steps to achieve a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C and endeavouring to limit it to 1.5°C.

More than other professions, engineers and geoscientists will be called upon to provide the solutions to meet increasing demands for energy, to combat climate change and to adapt to its impacts. APEGS is a professional association that requires its members to hold paramount the safety, health and welfare of the public and the protection of the environment. Let us respond to this call to action and enable a path toward a sustainable future in Canada and around the globe.

Kevin Hudson, P.Eng., is chair of the APEGS Environment & Sustainability Committee, and is the Metering & Sustainable Electricity Manager with Saskatoon Light & Power. Hudson has 25 years of experience working in the energy industry in Saskatchewan and Alberta.

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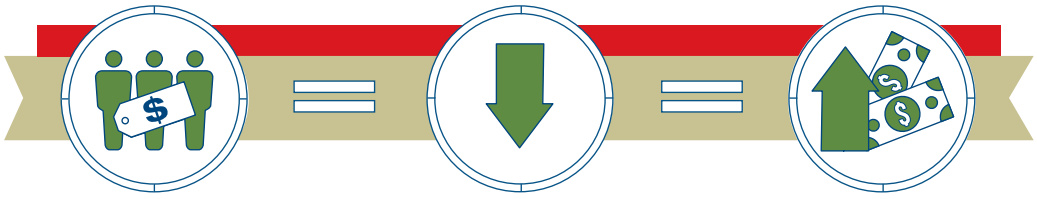

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Assumptions: The individual MER (management expense ratio) was calculated using the average Canadian equity mutual fund of 2.34 per cent obtained from Morningstar January, 2010. The group IMFE (investment management fee and expense) was calculated using the Jarislowsky Fraser Canadian Equity fund of 1.19 per cent plus GST. We've assumed a rate of return of five per cent on an investment of $500,000. $25,000 was withdrawn at the end of each year for 12 years. The accumulated assets in the chart have been rounded to the nearest dollar.

News Beyond Our Borders

Solar surprise

Ensia - In Jan. 2015, Saudi Arabian company ACWA Power surprised industry analysts when it won a bid to build a 200-megawatt solar power plant in Dubai that will be able to produce electricity for 6 cents per kilowatt hour. The price was less than the cost of electricity from natural gas or coal power plants, a first for a solar installation. Electricity from new natural gas and coal plants would cost an estimated 6.4 cents and 9.6 cents per kilowatt-hour, respectively according to the US Energy Information Agency.

Technological advances, including photovoltaics that can convert higher percentages of sunlight into energy, have made solar panels more efficient. At the same time, economies of scale have driven down their costs.

For much of the early 2000s, the price of a solar panel or module hovered around $4 per watt. The dramatic reduction in cost came from a wide number of incremental gains. Factors include a new, low-cost process for making polycrystalline silicon; thinner silicon wafers; thinner wires on the front of the module that block less sunlight and use less silver; less-expensive plastics instead of glass; and greater automation in manufacturing.

Electric paper

Discovery - A new kind of paper has the remarkable ability to store energy like a supercapacitor. It comes from researchers at Sweden's Linköping University's Laboratory of Organic Electronics and it has the potential to turn a new chapter for renewable energy.

The so-called "power paper" was made from cellulose fibres that were subjected to high-pressure water until they broke down into fibres as thin as 20 nanometres in diameter. Next, the fibres were coated in an electrically charged polymer and fashioned into a round sheet.

Each sheet, which is 15 centimetres in diameter and a few tenths of a millimetre thick, can store as much as supercapacitors currently available on the market. The material can be recharged hundreds of times and each charge only takes a few seconds.

The paper is waterproof and was created with no dangerous chemicals or materials.

Latest green technologies at Construct Canada

Canadian Consulting Engineer - Rodney Wilts of Windmill Developments listed off a plethora of promising new green building technologies at The Buildings Show/Construct Canada on December 3 in Toronto.

Among the green building innovations Wilts noted:

Algae-filled glass. Curtain walls on the BIQ building in Hamburg, Germany. The microalgae grow within the glass and provide shade to the interior. They are then harvested and shipped offsite to produce energy.

SolaRoad. A bicycle path near Amsterdam in Holland that has solar panels embedded in its surface. They're expected to generate 70 kWh per square metre per year and are performing well.

GlasPro Bird Safe Glass. The glass has a coating that humans cannot see, but which appears dark blue to birds so they are deterred from flying into it.

Automated Parking Garages. The cars are stacked and retrieved automatically, which halves the building space required for parking. Also because the car engines are not started until the car is delivered to the front door, there is no need to ventilate the garage, which saves on exhaust fan energy. The occupants can use their smart phones to call for their cars to be delivered to the front door.

Wilts also showed how building materials are being transformed into green building agents. BioMason bricks that are literally grown from micro-organisms is an astonishing technology that uses micro-organisms that grow cement crystals. The bricks don't require firing.

Bionic eye linked to brain

New Scientist - A new technique that uses a camera mounted on a pair of glasses could help restore vision in some blind people.

The technology, developed at Monash University in Australia, sends images directly to the brain and could benefit those that still have a fully functioning optic nerve as well as some functioning nerve cells called ganglion, which are responsible for transmitting visual information from the retina to the optic nerve.

At a basic level, the system involves a digital camera embedded in a pair of glasses, a computer processor and finally a chip implanted in the patient's brain.

When the camera on the glasses picks up visual information from the outside world, it sends the information to a pocket-sized processing unit worn by the user. The processor modifies the images into a signal that can be transmitted wirelessly to the chip implanted in the brain.

When the digital signal from the processor is sent to the chip and out to the different parts of the brain, it stimulates these areas, and the person — even if blind — sees flashes of light.

The idea is that the grid of 11 tiles mimics a 500-pixel field of vision, and over time, the brain will learn to interpret each of the signals as an object.

At the moment, the images are crude representations of the real world. "The processor is like a cartoonist," Arthur Lowery at Monash University told *New Scientist*. "It has to represent a complex situation with minimal information."

But over time, the resolution would improve. Right now, researchers are focusing on ways to process the information from the camera so it can create the clearest image on the in-brain grid.

Fort York bridge first in duplex stainless steel

Canadian Consulting Engineer - New pedestrian and cycle bridges near the waterfront in Toronto will be the first in North America to have a structure built entirely of duplex stainless steel.

Duplex stainless steels make it possible to have a lighter structure as it is stronger than traditional materials. The material also has a higher resistance to corrosion and requires less maintenance.

The Fort York bridges are single span tied arches, the northern one 52 metres long and the south one 49 metres. The bridges provide clear views to Toronto and its neighbourhoods without dominating the skyline.

Engineers among Canada's 100 Most Powerful Women

Engineers Canada - Five professional engineers were included amongst this year's winners of the Top 100 Most Powerful Women in Canada Awards.

Held annually, the Women's Executive Network (WXN)'s Top 100 Most Powerful Women in Canada recognizes the accomplishments of professional women across Canada who are talented leaders and who inspire others to push the boundaries of what's possible.

At this year's Awards Gala, held on November 26, 2015, WXN honoured five professional engineers for their contributions to their fields:

- Micheline Bouchard, Corporate Director, TELUS, PSP Investments, International Women's Forum
- Catherine Karakatsanis, COO, Morrison Hershfield Limited
- Ann Mellema, Director, Programs Governance, Irving Shipbuilding
- Siobhan Robinson, Project Engineer, Kerr Wood Leidal Associates
- Jeanette Southwood, VP Strategy and Partnerships, Engineers Canada

Canadian Arctic readies for world's largest diamond mine

Mining.com - Only days after diamond giant De Beers announced it was shutting down its Snap Lake mine in the Northwest Territories, Canada's Arctic region has received some relieving news, as a new operation in the area, the world's largest diamond mine, is almost ready to begin production.

According to Mountain Province Diamonds, which holds a 49 per cent stake in the Gahcho Kué diamond mine, the project is nearly 80 per cent complete and on track to begin producing gems in the second half of 2016.

Gahcho Kué — majority owned by De Beers — is also ready to take part of the hundreds of workers laid off at Snap Lake.

Gahcho Kué is the world's largest new diamond mine and is expected to produce an average of 4.5 million carats a year over a 12-year mine life.

But what makes the mine especially important is the fact that two of Canada's major diamond mines, Diavik and Ekati, are approaching the end of their productive lives. Although it's smaller, Gahcho Kué would be able to offset the production drop-off.

Snap Lake accounted for 1.2-million carats of De Beers' output of 1.8-million carats from two operational mines in Canada last year.

The mine had a difficult year, with output falling 100,000 carats because of flooding and revised underground support standards. In fact, the operation never made a profit in the seven years it remained up and running.

News From The Field

Wikipedia.org

Refugee professionals face barriers

CBC News - Engineers tend to be well represented in just about any group, and there's reason to believe the coming wave of Syrian refugees will contain some as well. Professional associations across the country are staying alert to the special challenges that Syrian refugee professionals will face.

There could be language issues, financial issues, and they might not be able to get their universities to send them documentation.

The problem of immigrants working outside the field of their expertise is widespread, according to Joan Andersen with Mosaic, a non-profit organization that helps with immigrant and refugee settlement.

"We've all heard the stories of the doctors driving the cabs," she said. "Those stories are all true and the statistics do bear out that internationally trained professionals, whether they're immigrants or refugees, have a hard time getting work in our country that's commensurate with their skills, education, and experience."

Andersen says that only one in four to one in five immigrants to Canada is working in a field and pay grade for which they're qualified.

Left-foot braking: is it safer?

Toronto Star - Left-foot braking, or right foot? Perhaps the time has come to use two feet on two pedals. Trevor Frith is a Saskatchewan-born engineer who has witnessed two serious crashes where what he calls "pedal confusion" has been largely responsible.

People think they are hitting the brakes but are in fact hitting the accelerator, often with tragic results. This is especially true in multiple-car families, where the orientation of the brake and accelerator pedals varies from car to car. Sometimes in a stressful situation, you may forget which car you're in. In other instances, the right foot can slip off the brake onto the accelerator.

Frith has developed a website — www.leftfootbraking.org — in which he outlines the huge numbers of reported brake-pedal confusion incidents and the hundreds of deaths attributed to this situation in North America.

The site demolishes some of the myths surrounding this technique. By dedicating one foot to each pedal, it is far less likely that you will become confused.

Frith has been trying to bring this problem to the attention of driving schools and governments, hoping they will begin to teach people the proper and safe way to brake, so far with few positive results.

Others argue that the left foot should remain firmly planted on the floor to the left of the brake to allow the driver to brace himself for fancy steering to avoid a crash.

École Polytechnique awards first-ever Order of the White Rose

CBC News - Tara Gholami grew up being encouraged to try new things and launch herself into any project, something she says was not a given in Iran. The 23-year-old engineering student is the first recipient of the Order of the White Rose – a $30,000 scholarship established by the École Polytechnique last year, to be awarded to a female graduate student of engineering enrolled at the institution of her choice.

Gholami was born in Iran and came to Canada when she was 11. She credits her parents with giving her the love of engineering.

"My dad, for example, would always include me in any project around the house that he wanted to do," she said.

"I never grew up thinking that there was a difference between women and men in the engineering profession. My mom herself was an engineer. She was my role model."

Gholami is hoping to join the surgical robotics industry. She has a mechanical engineering degree from the University of Calgary and is now pursuing a graduate degree at Stanford University.

UNIVERSITIES AND RESEARCH

University cuts hit water security research

Saskatoon StarPhoenix - Just months after the University of Saskatchewan agreed to hold back $20 million in spending to help the provincial government balance its budget, the province is cutting $9.8 million from the university's annual grant.

While the institution is "concerned" about the long-term implications of the cuts, jobs will not be lost as a result. Rather, money will be pulled from the university's reserves to cover its 2015-16 budget, which could affect the timeline or scope of multi-year projects.

A portion of this year's lost money — $1.35 million toward supporting the work of a Canada Excellence Research Chair in water security — is being deferred.

Saskatoon doctors on cutting edge of robo-health care

Saskatoon StarPhoenix - Dr. Tanya Holt was driving to Regina when she got an urgent phone call. An infant in Pelican Narrows had a respiratory problem called bronchiolitis. The health care team there wanted to know if the child was at risk for respiratory failure and needed to be sent to Saskatoon, or if they could safely care for the child themselves. Holt, director of pediatric critical care for the Saskatoon Health Region, could see her patient over the phone and talk with the team. They gave the child some medication, then Holt watched on the side of the highway for about 20 minutes before deciding the child could stay there for the time being, but she'd check in later.

This is one small example of the robotic health care revolution sweeping Saskatchewan.

"Using the robot is actually fairly intuitive," says Rachel Johnson, a nurse practitioner in Pelican Narrows. After figuring out the best positioning, they were able to give a thorough assessment and keep the child in Pelican Narrows for treatment.

The process for getting to Pelican Narrows, to care for a baby with an acute respiratory illness, for example, goes like this: a medical team takes a plane into Sandy Bay — the Pelican Narrows airstrip is currently out of service — and drives 45 minutes to the town to pick up the child, drives back, and returns to Saskatoon.

This journey delays treatment by hours, which can prove fatal. It's also a huge expense, as each round trip costs $10,000.

Robotic technology provides a cheaper and more effective way to deliver treatment.

Specialists in Saskatoon can also help out with far more advanced tests. The remote presence lab on the fifth floor of the Health Sciences Building at the University of Saskatchewan has the only system in North America capable of performing a remote ultrasound.

The Pelican Narrows robot, which specializes in care for acutely ill children, is part of a series of pilot projects. Canoe Lake has a "doctor-in-a-box," a lunch box-sized screen that allows a doctor to observe and talk to patients and their families, which is also meant for pediatric care. La Ronge has a Star Trek-esque infrascanner that can detect brain hemorrhage.

The robots are clinically effective and cost efficient. A full robot costs $80,000, while the doctor-in-a-box costs $25,000.

Of 32 patients seen so far using remote technology, only 13 have had to be taken to Saskatoon.

How Canada reversed the brain drain

Toronto Star - Jenny Hoffman is the University of British Columbia's — and almost certainly the country's — newest, shiniest academic hire. The professor of quantum materials was lured away from Harvard to build strange substances that exploit the laws of physics in new ways.

But the lab isn't what drew Hoffman, 37, to Canada. She had pretty great facilities in the US.

"The main thing is the really terrific community here," Hoffman says.

In the 1990s, this country was consumed with the spectre of a "brain drain": the loss of scientific, engineering and medical talent to the US in an era of Canadian belt-tightening.

A slew of programs, old and new, have reversed the brain-drain narrative. In 2000, the Canada Research Chair program created 2,000 funded positions with the explicit

purpose of attracting and retaining the world's top minds. The Canada Excellence Research Chairs (CERC) program is an outgrowth of that, providing a bigger pot of money to an even smaller and more selective pool: 24 researchers each receive up to $10 million over seven years.

Hoffman's research was also the first recipient of the Canada First Excellence Research Fund, a $1.5-billion pot of research dollars to be doled out over seven years.

"You need money to attract top people, because they can't do their work unless they have enough money to buy the equipment they need to do it," Hoffman says.

According to Alan Bernstein, president of the Canadian Institute for Advanced Research, Canada's research-excellence ecosystem is better than it ever has been at retaining and attracting top talent. But there are still holes: even as mature researchers stay, academics voice concerns about losing young people to the U.S., especially to Silicon Valley.

Brain drain "is going to continue to be a threat," says Bernstein. "We're always churning out really smart young people, and we need to make sure they have opportunities here in Canada.

ENERGY

Sask. researcher on sustainable energy encouraged

CJME - Premier Brad Wall says 50 per cent of the province's power will come from renewable energy sources by 2030, but is that feasible?

Ph.D. student Martin Boucher researches decentralized sustainable energy systems at the University of Saskatchewan School of Environment and Sustainability and he calls it a very encouraging step forward.

According to SaskPower, 3 per cent of the provincial power grid is generated by wind power while 20 per cent is from hydro power and 44 per cent is from coal. The SaskPower website says about 400 homes and businesses use solar power as a secondary power source.

"There's definitely a lot of room for improvement," Boucher commented. "In other districts the renewable energy portfolio is a lot larger, so there's definitely the technical capabilities to increase that."

He says the potential for solar and wind power generation is very good in Saskatchewan.

"On a day-to-day basis, wind energy is very intermittent, but actually on a yearly basis it's pretty predictable," Boucher said.

"Solar has been helpful in other districts to deal with the peak load. During the summertime when you're using your AC and whatnot, the photovoltaic energy complements that increased demand very well."

Boucher says it will take a balanced approach to gradually build up the grid to achieve a 50 per cent mix of renewable energy.

"Most of the technologies that are currently used to generate electricity are baseload electricity in Saskatchewan, so we'll be able to continue using those but being very pragmatic about how we incorporate more renewable energy," he said.

Boucher's current research focuses on decentralized energy systems that people choose to install in their own homes or businesses at their own expense.

"We could have a bit of a conversation about maybe increasing those incentives for folks that want to have renewable generation," he said.

For example, he says right now it takes nine years for individuals to make back the money they spend on installing solar panels. Boucher says there could be a better mix of incentives for people to switch to renewable energy sources and he expects that would drastically increase the uptake.

ENVIRONMENT

Wakamow's "green" project first for Saskatchewan

Moose Jaw Times Herald – "Think like a beaver." That's what Margaret Moran, CEO of Wakamow Valley Authority, said to herself when the park needed a riverbank restoration.

Thanks to her team's forward beaver-like thinking, they will become the first in the province to restore a riverbank by using all natural resources.

Sections of the river and Plaxton's Lake reservoir bank suffered severe erosion during the floods of 2011, 2013 and 2015. The erosion that developed during those events is threatening bridge infrastructure, roads and trails that are vital to the park.

The restoration work has been designed with a bio-engineered or green approach that will include some rock structures to direct channel flows.

Materials used will include woody debris, trees of varying sizes placed perpendicular to the flow, dirt and vegetation.

"In simplified terms, we're mimicking nature and the methods used by the beaver," said Moran who also noted that building green works is more effective and more cost-efficient.

"The difference between green and hard engineered methods is that hard engineer methods are very strong in the beginning but weaken over time. The green method is kind of the reverse. It's more vulnerable in the beginning but over time it strengthens up," she said.

The $1 million restoration project is funded under the Provincial Disaster Assistance Program. Construction has already started and will continue into winter and early spring.

Lake Diefenbaker water quality at risk

CBC News - Researchers say the water quality of Lake Diefenbaker is moderate, but lower flows from the South Saskatchewan River could make things worse.

Complaints from local people about an increase in algae blooms spurred the University of Saskatchewan's Global Institute for Water Security to do a major study of the lake's water quality.

The study found a high percentage of phosphorus in the water, a nutrient that could create large amounts of algae.

"It could be at a tipping point," said research associate Rebecca North. "It seems like the moderate water quality is being maintained now, but any additional inputs of nutrients to the reservoir could result in declines of water quality."

It seems like the lake's cloudy water is saving the reservoir so far. Algae needs sunlight, as well as nutrients, to grow.

If the amount of water coming in from the South Saskatchewan River declines, the water could become clearer, exposing the nutrients to sunlight.

"The flow coming in from the South Saskatchewan River originates from snow melt and precipitation in the Rocky Mountains," she said. "Any kind of change in those precipitation patterns or snow melt will cause algal blooms. Climate change estimates predict we will have reduced flows in the future."

Algae can be a serious problem for people who use drinking water from lakes.

"Under certain conditions, they can produce algal toxins," she said. "The city of Toledo, last summer, had to close down their drinking water supply because of algal blooms in Lake Erie."

North said there are things local landowners can do to reduce the amount of nutrient flowing into the water through runoff.

"I would say that we can do some land management practices along the South Saskatchewan River to increase the particulate load flowing into the reservoir to keep it turbid," she said.

Researchers from the University of Saskatchewan tested the water at Lake Diefenbaker over a span of three years. They combined their research with historical research done by the University of Regina to see if the water quality was declining.

OIL AND GAS

Husky Energy approves new heavy oil thermal project

OilVoice - Husky Energy has sanctioned Rush Lake 2, a new 10,000 barrels per day (bbls/day) heavy oil thermal development in Saskatchewan. The company's heavy oil thermal production is expected to reach about 80,000 bbls/day by the end of 2016, from about 18,000 bbls/day in 2010.

The Rush Lake 2 thermal project builds on a proven template of heavy oil thermal developments in the Lloydminster region and is anticipated to start in late 2018. Construction is currently under way at three thermal projects scheduled to begin production next year and resources are expected to be directed to Rush Lake 2 as that work is completed.

These bite-sized projects use a highly standardized and modular approach to development. Husky achieves cost savings and efficiencies in engineering, module fabrication, construction and ongoing operations.

Husky has an unmatched land and infrastructure position in the Lloydminster region designed to extract added value from its heavy oil thermal production. Its facilities include the Saskatchewan gathering system, Lloydminster Upgrader and asphalt refinery, oil storage capacity at Hardisty and the company's strategically located refinery in Lima, Ohio.

Saskatchewan land sale revenues plummet in 2015

Regina Leader-Post - Besides hundreds of millions of dollars in lower royalty revenues, low oil prices have also taken their toll on land sale revenues for the province, the Ministry of the Economy confirmed.

The December sale of petroleum and natural gas rights raised $10.9 million in revenue for the province, bringing the calendar year total for 2015 to $56.5 million, the ministry said in a news release.

By contrast, the December sale last year netted $18.3 million in revenue, bringing final land sale revenues for the 2014 calendar year to $197.9 million.

The December sale saw the Lloydminster area receive the most bids with sales of $4.8 million. The Weyburn-Estevan area was next at $2.92 million, followed by the Kindersley-Kerrobert area at $2.91 million and the Swift Current area at $254,187.

The top purchaser of acreage in the province in the December sale was Windfall Resources Ltd., which spent $2.77 million to acquire three lease parcels.

While December sale revenue was well below that of the December 2014 sale, it was higher than the $9.9 million netted in the October sale.

Saskatoon's synchrotron to partner with University of Calgary oil researchers

CBC News - The University of Saskatchewan's synchrotron is partnering with the Petroleum Technology Research Centre (PTRC) at the University of Regina and the School of Engineering at the University of Calgary (U of C) to find new ways to get more cold heavy oil out of underground oil wells.

The partnership was announced at the U of S. Innovation Saskatchewan is kicking in $160,000, along with $100,000 from the PTRC. The Canadian Light Source Synchrotron (CLS) and the U of C engineering are both contributing through their work and research on the project.

According to an emailed release sent out by the CLS, the synchrotron will be used to image a heavy oil system, detailing foamy oil formations in reservoirs.

The work will allow those in the oil industry to see and understand heavy, foamy oil dynamics as the oil is depressurized in a reservoir when it's brought to the surface.

The end goal of the work is to increase the recovery rate of this heavy oil, which, unlike lighter crude oil, is found in the Lloydminster area and eastern Alberta, according to University of Calgary professor Ian Gates.

Another contributor to the decreased pressure is the movement of sand particles through the oil as it's brought to the surface, according to Gates, who specializes in chemical and petroleum engineering.

URANIUM AND NUCLEAR

Tailings cleanup can begin at abandoned uranium mine

Saskatoon StarPhoenix - Canada's nuclear watchdog has approved part of a quarter-billion-dollar plan to clean up an abandoned uranium mine in northern Saskatchewan.

In a written decision, the Canadian Nuclear Safety Commission gave the Saskatchewan Research Council (SRC) the go-ahead to begin remediating 4.4 million tonnes of radioactive tailings at the derelict Gunnar uranium mine site.

The SRC, which is contracted by the provincial government to clean up the site, began work on the Gunnar mine in 2010 by demolishing asbestos-contaminated buildings. Now it will begin looking for a contractor to cover the tailings deposits with a 0.6-metre-thick earthen cover, according to SRC vice president of environment Joe Muldoon.

A contractor will be chosen in late winter or early spring, and work on the tailings deposits will begin once the weather permits access to the site. It will continue for "up to four field seasons," Muldoon said. The exact cost and timing of the tailings remediation will depend on the procurement process and factors such as the weather, he added.

Located near Uranium City, about 800 kilometres north of Saskatoon, the Gunnar uranium mine began production in 1955 and was shuttered in 1964. Virtually no cleanup work was done before the site was abandoned.

In 2006, the provincial and federal governments agreed to clean up the deserted mine. The project, originally expected to cost $24.6 million, is now expected to cost over ten times that amount with estimates ranging as high as $268 million.

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1 Canadian Cancer Statistics, 2013. 2 Heart & Stroke Foundation Statistics, 2013. 3 Colleen Nelson B.Ed, PBCE, "The Financial Hardship of Cancer in Canada: A Literature Review," Canadian Cancer Society, 2010.

The Manufacturers Life Insurance Company

Calendar Of Events

Leadership, Problem Solving and Decision Making
Feb 17-18, 2016, Vancouver, BC
https://www.apeg.bc.ca/Events/Events/2016/16FEBLPS

Toyota KATA Workshop
Feb 17, 2016, Winnipeg, MB
www.daretocompete.ca

IPEIA - 20th Annual Conference
Feb 24, 2016 at 8:00 AM, Banff, AB

49th International Conference on Water Management Modeling
Feb 24-25, 2016, Brampton, ON
http://www.chiwater.com/Training/Conferences/conferencetoronto.asp

Project Management for Municipal and Provincial Projects
March 7-8, 2016, Vancouver, BC
https://www.apeg.bc.ca/Events/Events/2016/16MARPMF

IEEE IAS Electrical Safety, Technical and Mega Projects Workshop
March 13, 2016, Edmonton, AB
http://sites.ieee.org/estmp

SustainTech Conference - SEIMA
March 17, 2016 at 8:00 AM, Regina, SK
www.seima.sk.ca/

Creativity and Convergence Conference
March 24, 2016, Edmonton, AB
http://www.abctech.ca/innovation-creativity

SustainTech 2016 - SEIMA
April 12, 2016 at 8:00 AM, Saskatoon, SK
www.seima.sk.ca/

Strategy Formulation
April 21, 2016, Winnipeg, MB
www.umanitoba.ca/faculties/management/exec_programs/strategy-formulation.html

Get to the Point!
Practical Writing Course for Technical Professionals
May 4-5, 2016, Saskatoon, SK
www.apegs.ca

APEGS Annual Meeting
May 5-7, 2016, Saskatoon, SK
www.apegs.ca

Geoscientists Canada Annual Meeting
June 3-4, 2016, Calgary, AB

Canadian Academy of Engineering
June 27-28, 2016, Winnipeg, MB
www.cae-acg.ca

PNWER 26th Annual Summit
July 17-21, 2016, Calgary, AB
www.pnwer.org/upcoming-events.html

PUBLICATION MAIL REGISTRATION NUMBER: 40034203