

The official
publication
of Engineers
Geoscientists
Manitoba

THE KEYSTONE PROFESSIONAL

SUMMER 2018



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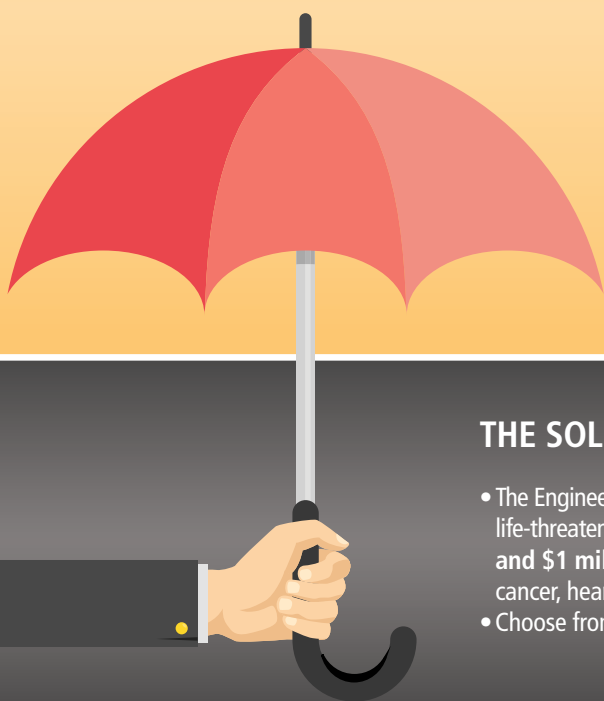
FACTS CANADIANS NEED TO KNOW ABOUT CRITICAL ILLNESS.

Thanks to medical advances, Canadians are more and more confident about surviving a critical illness. However, many still remain unprepared for the financial impact of such a diagnosis. The Engineers Canada-sponsored Critical Illness Plan can help if the unexpected occurs to you or a family member. Consider the facts below, and ask yourself: Are you financially prepared?



1 THE RISK OF CRITICAL ILLNESS.

- **1 in 2 Canadians** will develop cancer in their lifetime.¹
- **206,200 Canadians** were diagnosed with cancer in 2017.¹
- About **9 in 10 Canadians** already have at least one risk factor for heart disease and stroke. In Canada:
 - there is 1 heart attack every 7 minutes.²
 - there are 62,000 strokes every year.³



2 SURVIVING A CRITICAL ILLNESS.

- **About 60%** is the 5-year net survival rate for people diagnosed with cancer, but it varies widely by the type of cancer.¹
- **2.4 million Canadians** are currently living with the effects of heart disease.⁴
- **400,000 Canadians** are currently living with the effects of stroke.⁵

3 UNDERSTANDING THE FINANCIAL IMPACT OF HAVING A CRITICAL ILLNESS.

- Cancer accounts for **\$586 million** in indirect costs from loss of productivity or premature death.¹
- More than **400,000 Canadians** live with long-term disability from stroke. Recovery can take months or years, even for milder strokes, and many people never fully recover.⁵

THE SOLUTION: HOW CRITICAL ILLNESS INSURANCE CAN HELP.


- The Engineers Canada-sponsored Critical Illness Plan **pays a lump sum** upon diagnosis of a covered life-threatening condition. You and your spouse may apply for benefit amounts **between \$25,000 and \$1 million** to help meet the costs associated with surviving a serious illness, such as cancer, heart attack or stroke.
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¹ Canadian Cancer Society, 2017. <http://www.cancer.ca/-/media/cancer.ca/CW/publications/Canadian%20Cancer%20Statistics/Canadian-Cancer-Statistics-2017-EN.pdf>

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THE KEYSTONE PROFESSIONAL

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Keeping it Professional: Thoughts on the Name Change

In 2017, three different by-law proposals were received, all proposing changes to the same set of by-laws, forcing those who voted to pick only one of the three. The three proposals were: a Council proposal intended to improve the by-law change process; a member proposal intending to do the same; and a member proposal that would have no legislative effect, but changed how the Association was referred to within one specific clause. In that three-way race, Council's proposal ultimately passed with 300 members voting for it. Close behind it with only 26 votes less, but not enough to pass, was the proposed by-law that would have had no effect on the operations of the Association, the governance of Council, or on the practice of the members.

Although that proposal did not pass, and would not have had any effect, either legislatively or on the name of the Association itself, should it have passed, I believe it sends a clear message to Council that a significant portion of the membership is either unhappy with, or concerned about, the Association's current working name. As such, I wish to provide some of my personal thoughts on the most common feedback I hear.

Before I begin though, I should quickly note that there are easier ways of getting Council's attention. I read and consider all emails sent to me at President@EngGeoMB.ca. If warranted, or automatically, if requested, I share those emails with all of Council at the next meeting. Alternatively, passing a resolution at the Annual General Meeting forces Council to provide an official response at the next AGM.

Returning to the name change itself, in 2015 the Association changed its working name from The Association of Professional Engineers and Geoscientists of Manitoba to Engineers Geoscientists Manitoba. The most common concern I hear about this is that because we have dropped the word "Professional" from our name it implies we are no longer

We are all "P.Eng."s or "P.Geo."s, ... both calling ourselves, and acting as, professionals continues to be central to our practice.

professional, or no longer wish to enforce the "professional" part of our designations. This is not the case. The Association was already enforcing, and continues to enforce, the use of the broader terms "engineering" and "geoscience" throughout this province. Non-professionals using a company name like "X and Y Engineering" are not afforded a pass simply because they have not included the term "professional" within their name. The current name better reflects to the public that broader scope of monitoring, which includes cases where the term "professional" is absent. This does not dissuade from the importance of that term, or, as a result, our emphasis of it throughout our messaging. We are all "P.Eng."s or "P.Geo."s, and we continue to distribute lapel pins to let you show that off to the world. Both calling ourselves, and acting as, professionals continues to be central to our practice.

Another common response I witness is the use of our old acronym, APEGM ("Ah Peg Em" or "Ah Peg Um"), used purposefully in conversation, with special emphasis on that delightfully blended elision, followed by a slight twinkle of the eye and conspiratorial glance, and then the comment, "I hear we're not supposed to call it that anymore." As someone who has himself potentially taken joy in flouting authority in the past, it is then with a tinge of sadness that I have to inform them that, "No, that's actually okay." People who already understand what that multi-syllabic mash up means in conversation are not the target audience. The fact that, even in protest, our old name in full, The Association of Professional Engineers and Geoscientists of Manitoba, is too long and awkward to be spoken out loud, is likely a sign that something more succinct for communicating to others has value.

It is also important to note that our legal name did not change, and variations of it are still used for internal purposes. For example, my Certificate of Election given to me on becoming president just last year, is still proudly stamped with a stylized, and old-fashioned-looking seal that reads "Association of Professional Engineers and Geoscientists of the Province of Manitoba". We continue to be proud of that name and its heritage, and you will continue to see it used in an official and formal capacity. However, when I'm out in public representing our Association, it is both much easier to say, and be understood, when I refer to ourselves as, Engineers Geoscientists Manitoba.

As Engineers Geoscientists Manitoba, we monitor all uses of the terms "engineer" or "geoscientist" in Manitoba and protect the public by making sure those who practice engineering and geoscience are "professionals", both in name and in action. ☺



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Think Like a **Business Leader**

An engineering manager must think like a business leader to be truly effective. Don't fall victim to the old mindset that engineers can figure out anything. Finance, marketing, advertising, communications, relationship management? You can't be good at everything.

Other Professionals

Engineering uses science to solve science-based problems of time, space, materials, and conditions. Let others do the non-scientific parts. These professionals include accountants, lawyers, marketing specialists, interior designers, communications specialists, and others.

Don't be deluded. Better results will be achieved if you spend the budget to hire others, rather than if you save a few dollars by assigning it to an engineer. Sure, many engineers have energy and aptitude for non-engineering topics, but is that what you want in your business? Do you want an engineer's perspective on advertising and promotions, law, or accounting? Or would you rather have a marketing specialist promote your brand, a lawyer interpret the law, and an accountant invest the money?

Work in Scope

Consider the following. Do we work outside our scope? No, we're not supposed to. The Code of Ethics says we're not supposed to give an opinion or make statements on

matters which are not part of our education, qualifications, and experience. So why do we sometimes get trapped into thinking we're good at finance, law, marketing, and other non-engineering disciplines? My observation is that companies and businesses that have a diverse, well-rounded leadership team (a variety of professionals sitting at the management table) are more successful than ones that are laden with engineers.

Business in Manitoba

Engineers Geoscientists Manitoba currently has 888 companies licensed in Manitoba. Some are engineering consulting firms, while others are businesses practising engineering in a way that has an impact on the citizens of Manitoba. The Association is tasked with the duty to regulate these businesses (and the practitioners they employ) to ensure that engineering and geoscience are done competently, safely, and in the public interest. I hope you are a successful leader in one of these businesses. The economy of Manitoba benefits from your hard work and leadership. Real GDP grew 2.2% in 2017 in our province.¹ I'm certain that you will be a successful business leader in your industry if you include other professionals on your leadership team.

References

- ¹ Source: "Manitoba Economic Highlights", Manitoba Bureau of Statistics, April 6, 2018 Report, page 1. [ⓧ](#)

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Biomass Fuels a Unique Opportunity for Manitoba

By N. Cicek, P.Eng.

Growing up in the scenic small city of Feldkirch, Austria, in the 1970s and early '80s, I remember stoking our wood- and coal-burning oven during the snowy winter months, and having the job of disposing of the ash. To this day, I enjoy the smell of burning wood, poking at a flaming fire, and listening to the crackle.

To my surprise, during a recent tour of a new research facility here at the University of Manitoba (U of M), I discovered that the biomass pellet boiler and power generation system, recently commissioned by Dr. Qiang Zhang, originated from Austria, not far from where I grew up. The company (ÖkoFen Pellet Heating) is one of 160 within the Eco-Energy Cluster in the state of Upper Austria (or Oberösterreich), which employs 8,800 people and generates \$3 billion in annual revenue.

The state of Upper Austria presents a compelling case study, shedding light on what might be possible here in Manitoba when it comes to renewable heating. With a population of 1.4 million and similar GDP to Manitoba, Upper Austria can boast of a 47 per cent share of renewable heating in the overall energy mix, largely owing to the use of biomass in the form of wood pellets, wood chips, fire logs and whole trees. With 41 per cent of its land area covered by forests, the region has aggressively moved to biomass heating with a diverse set of economic incentives, state regulations, emission and efficiency standards and public education campaigns.

Upper Austria has set a target of space heating with 100 per cent renewable sources by 2030. It is home to technology providers with global leadership in the areas of automatic pellet heating

systems for single-family homes, automatic wood chip heating systems for commercial spaces and institutional buildings, low-emission firewood boilers for rural buildings, and larger-scale district heating systems using a variety of biomass sources. Because of progressively more stringent efficiency and emission standards set by the government, these new-age biomass boilers are exceeding 93 per cent efficiency and meet strict environmental and fire safety regulations.

The regional economic gains have been impressive, with over 50,000 modern biomass boilers manufactured annually (a 25 per cent market share in the European Union), sustaining 4,500 full-time biomass heating-related jobs and displacing \$1.6 billion in fossil fuel imports. The avoided CO₂ emissions add up to 1.7 million tonnes per year, which could



be worth another \$85 million in annual carbon credits (at \$50/tonne of CO2).

Although Manitoba does not have a similar profile in terms of its forestry sector and availability of wood biomass, we do have a rather unique opportunity with respect to another form of natural plant material. The combination of wetland biomass (cattails, bulrushes, reeds and prairie grasses) and agricultural crop residue (wheat, canola and flax straw) that can be sustainably harvested, adds up to over 11 million tonnes per year. In terms of energy content, this represents more than twice the amount of natural gas consumed within the entire province.

In a recent study at the U of M, our group showed that fuel pellets made from cattails harvested at a local wetland proved to have similar energy content to standard wood pellets, required no additional binders, and demonstrated comparable durability during transport. The higher-than-standard ash content of these pellets (compared to commercial wood pellets) poses a challenge in terms of burning efficiency, emissions and boiler maintenance. Current research in this area aims to provide solutions through changes in boiler operation, testing a variety of pellet blends (wood, cattails, cardboard, straw) and optimizing biomass harvest times and methods.

An additional benefit of harvesting wetland biomass for bioenergy applications is the removal of excessive nutrients (particularly phosphorus) from the landscape. Phosphorus is the precursor to algal blooms in our lakes and rivers and its removal from the watershed is critical in reducing the frequency and severity of these blooms. Every tonne of biomass harvested for a bioenergy application would result in 1.5 to three kilograms of phosphorus taken off the Manitoba landscape. Phosphorus recovery from biomass ash is a well-studied topic and promises to allow future extraction from stored ash and the potential generation of a renewable fertilizer product.

As shown by the 53,000 automatic biomass boilers in operation in homes and buildings in just one region of Austria, a fast transition to renewable heat is possible. In the span of 20 years,

biomass heating grew sixfold, while the use of heating oil and natural gas dropped drastically. Technological and regulatory changes and the grassroots demand for more sustainable means of heating drove this disruptive change.

Starting with institutional and commercial settings (public buildings, schools, community centres, warehouses, shop floors) and moving to single-home applications and ultimately district heating, Manitoba can follow a similar path.

The automatic pellet furnace in the basement might not have the sights, smells and sounds of the traditional fireplace, but it will warm our homes and should warm our hearts in knowing that this is truly a green and Manitoba-made solution.

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CRITICAL MINERALS

By R. Reichelt, P. Geo., FGC

The List

On February 16, 2018, the United States Geological Survey (USGS) released a list of 35 minerals deemed critical to the American economy^{1,2}. While the Canadian economy is distinct from the American, it is an economic reality that they are deeply integrated. Thus, it is relevant to consider this list as applicable to our situation in Canada and Manitoba. With that in mind, let's look at the minerals on the USGS list and see which of those are mined here in Manitoba. The list of minerals mined in Manitoba is found at www.gov.mb.ca/iem/info/companies/industrial.html. While some or most of the minerals listed below may occur in Manitoba, where one is mined in Manitoba, the location of the mine is highlighted in blue.

Aluminum is used in almost all sectors of the economy. The raw ore for aluminum, bauxite, is not mined in Manitoba. We have abundant electrical power for smelting aluminum here in Manitoba, but to supply an aluminum smelter in Manitoba would require a deep-water port to bring in the bauxite and a reliable railroad to transport ore and product. The railway to Churchill is currently closed and it is not likely to be re-opened any time soon.

Antimony is used in the manufacture of batteries and for flame retardants. It is not mined in Manitoba.

Arsenic is used in lumber preservatives, pesticides, and to manufacture semiconductors. It is not mined in Manitoba.

Barite is used in cement and drilling fluid for the petroleum industry. It is not mined in Manitoba.

Beryllium is used in aerospace alloys. It is not mined in Manitoba.

Bismuth is used in medicines and in atomic research. It is not mined in Manitoba.

Cesium is used in cesium formate drilling fluids and some research applications. [The Tantalum Mining Corporation of Canada Limited \(Tanco\) mines cesium at their Bernic Lake mine.](#)

Chromium is used primarily in the manufacture of stainless steel and other alloys. It is not mined in Manitoba.

Cobalt is used in to make rechargeable batteries and in alloys. [Vale Canada Limited mines cobalt at their Thompson and Birchtree mines.](#)

Fluorspar is used in the manufacture of aluminum, gasoline, and uranium fuel. It is not mined in Manitoba.

Gallium is used for manufacturing integrated circuits and light emitting diodes (LEDs). It is not mined in Manitoba.

Graphite is used for lubricants and as electrodes in batteries and fuel cells. It is not mined in Manitoba.

Hafnium is used for nuclear control rods as well as in alloys and high-temperature ceramics. It is not mined in Manitoba.

Helium is used in magnetic resonance imaging scanners (MRIs), for balloons, and in research. It is not produced in Manitoba.

Indium is mostly used in the production of liquid crystal display (LCD) screens. It is not mined in Manitoba.

Lithium is used primarily for the manufacture of batteries. (See the Winter 2016 Edition of *The Keystone Professional*). [The Tantalum Mining Corporation of Canada Limited \(Tanco\) mines lithium at their Bernic Lake mine.](#)

Magnesium is used in the manufacture of light weight alloys, for the linings of furnace used to make steel, and in ceramics. It is not mined in Manitoba.

Manganese is used as a component in steel alloys. It is not mined in Manitoba.

Niobium is also used as a component in steel alloys. It is not mined in Manitoba.

Platinum group metals are used for catalytic agents, such as the catalytic converters in automobiles and fuel cells. [Vale Canada Limited mines platinum at their Thompson and Birchtree mines.](#)

Potash is primarily used as a component of fertilizer. While not currently mined in Manitoba, efforts continue to develop a potash mine in the Russell – McAuley area.³

Rare earth elements group are used primarily in the manufacture of batteries and electronics. They are not mined in Manitoba.

Rhenium is used as an anti-knock additive to gasoline and in metal alloys. It is not mined in Manitoba.

Rubidium is used in the manufacture of electronics and for research and development. It is not mined in Manitoba.

Scandium is used for the manufacture of alloys and fuel cells. It is not mined in Manitoba.

Strontium is used to manufacture ceramic magnets and for fireworks. It is not mined in Manitoba.

Tantalum is used in the manufacture of capacitors and other electronic components. (See the Winter 2016 Edition of *The Keystone Professional*). [The Tantalum Mining Corporation of Canada Limited \(Tanco\) mines tantalum at their Bernic Lake mine.](#)

Tellurium is used as an additive to steel alloys and in the manufacture of solar cells. It is not mined in Manitoba.

Tin is widely used for protective coatings (tin cans) and in steel alloys. It is not mined in Manitoba.

Titanium is used to make white pigment and for metal alloys. It is not mined in Manitoba.

Tungsten is primarily used to make wear-resistant metal alloys. It is not mined in Manitoba.

Uranium is mostly used for nuclear fuel. It is not mined in Manitoba.

Vanadium is mostly used in manufacturing titanium alloys. It is not mined in Manitoba.

Zirconium is used to manufacture high-temperature ceramics. It is not mined in Manitoba.

Opportunities

So, what do we make of this? Do we bemoan our inability to produce minerals for the “high tech” economy of today? Or do we seize the opportunities presented by the needs of the new technologies? How we respond will determine the quality of life that we and our children enjoy in the future.

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First Place for University of Manitoba Aircraft Design Team

By C. Campbell

A group of 50 University of Manitoba Faculty of Engineering students beat out 35 teams from around the world for a first place finish in the SAE Aero Design East competition that took place in Lakeland, Florida from March 9-11. Besides bragging rights, the team also benefited from a monetary award, and acknowledgement from Winnipeg Mayor Brian Bowman with the presentation of an Outstanding Achievement Award for their winning entry of a 12-pound craft that successfully carried 38 pounds of cargo!

The students are all members of The University of Manitoba Society of Automotive Engineers (UMSAE), an organization that allows students to apply hands-on skills learned in the classroom to design and construct race cars, aircrafts, and off-road vehicles – bridging the gap between theoretical and practical engineering and exposing students to real-life engineering practices.

The main goal of the competition is for students to “compress a typical aircraft

development program into one calendar year, taking participants through the systems engineering process of breaking down requirements,” and team lead, Jasjyot Barmi, responsible for overseeing the technical design of the aircraft, has taken time out of his busy exam schedule to explain how it all came together this past year.

Can you give me some details on the process of the creation of your winning model? How long did it take? How often did you work on it? How did you decide on the parameters of the model? Where was it created?

After last year’s competition in March of 2017, the team for the 2017-2018 season convened in the summer (June-July 2017) after a much-deserved break. Although, at this phase, competition rules are not released and so we didn’t know what to design for, we still did testing on various components of the aircraft. Testing was performed on materials, the aircraft structure, and the aircraft’s motor, such

that the results could be implemented on any aircraft configuration.

The competition rules go through a major change every three years, and the major change had already happened in the previous year with the addition of tennis balls as passengers. So we knew that the rules would be mostly very similar to the previous year. The competition rules were released in early September, and they were fairly similar to previous years with the addition of a wing span limitation of 12ft. Further, the motor could only draw 1,000W, as per competition rules. With these two major constraints, the aircraft parameters were calculated using a custom sizing script developed by the team.

In order to verify these values, a 50% scale prototype was constructed and flown successfully in early October 2017. All aircraft were made in a dedicated workshop provided to us by the Faculty of Engineering. From this, and using testing data, a full-scale prototype was designed, based on peer and external design reviews. The entire month of November 2017 was



spent in construction of the prototype aircraft. During this time, we had 40-50 members come in on two daily shifts of three hours (first shift: 2-5 p.m., second shift: 5-8 p.m.) to construct the aircraft. The prototype aircraft was test flown in December 2017, and deficiencies realized from these test flights were addressed in the final competition aircraft.

The competition aircraft design was finalized in January 2018, and the design report, as per competition rules, was also created and submitted during that month. Two competition aircraft were made in February 2018, so we had a backup in case one aircraft crashed at competition. Again, a similar build shift system was implemented, but production was fast-tracked to complete two aircraft instead of one. The entire design process from beginning to end took 10 months, and involved the work of about 50 individuals. The project manager and myself pretty much worked on this project on a daily basis, and the section heads shared a similar workload, while we all juggled school courses on the side.

Were there specific roles that each person played in building the model? If so, how were those determined?

The team was split into seven sections; six for each major component of the aircraft; i.e. wing, fuselage, undercarriage, empennage, power plant, payload; and a seventh for data acquisition. A section head that oversaw the design and manufacturing of their respective section then led each section. As the team lead, I oversaw the technical design of the aircraft, and then a project manager managed the schedule and personnel of the team.

These roles were determined in the previous year, based on member involvement and interest, with each section head required to train a committed member able to take on their role in the following year.

A team lead and a project manager must have been a section head in the previous year, in order to ensure that they have sufficient experience with the team. All other returning and new members also play a crucial role in the team as well. They assisted the section heads in testing in the summer, and were primarily involved in construction of the aircraft. Due to the popularity of the SAE teams, these

members are accepted into the team based on a submitted application.

Hindsight is 20/20. What improvements or changes do you think could be made, if any?

There is definitely some work that could go into better predicting the aircraft's performance. We tried to implement a data acquisition system in the prototype aircraft that could provide aircraft speed, heading, rate of climb, etc., but had very limited success, even though we were able to get far into the system. Getting this data would allow us to better verify the mathematical model used in sizing our aircraft with the sizing script. We also introduced devices to improve wing efficiency this year that included wingtips and vortex generators. This addition definitely set us apart from the rest of the competition. Even though we had

positive fluid simulation data that proved their effectiveness, we had limited success during physical testing in a wind tunnel. Properly testing these devices will definitely allow us to know the effectiveness of these devices, which will again allow us to better predict aircraft performance.

The group has already made plans to participate in the SAE Aero Design competition again next year, and will compile, "and hopefully apply – haha" improvements based on the lessons learned from this year's competition! ⚡



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An Ethical Approach to the EMBRYO IMBROGLIO

By J. Robertson

Steven Casey's, *The Atomic Chef* is an engaging book that describes many true stories of human, design, and technology failure¹. *The Atomic Chef* not only demonstrates the impact that engineers have on the environment and society; but it also reminds engineers of their responsibility to hold themselves, and other engineers, to the highest standard of ethics and professionalism. One particular story draws attention to the consequences that arise when ethical practices are not prioritized. Specifically, the story entitled "The Embryo Imbroglia" outlines an unfortunate tale of professional wrongdoing.

"The Embryo Imbroglia" is a story of two women who sought pregnancy via in vitro fertilization in the IVF New York clinic. In the process of in vitro fertilization at this clinic, Dr. Lillian Nash, an infertility specialist, was responsible for overseeing the tasks of embryologist Dr. Michael Obasaju, as well as implanting the embryos into the corresponding patients. Dr. Obasaju was responsible for sorting both of the women's embryos according to their potential to survive and preparing them for implantation. The highest-grade embryos would be implanted and the embryos of lowest grade would be discarded; or so they should have been.

On April 24, 1998, both Mrs. Fasano and Mrs. Perry-Rogers would undergo the implantation process. As Dr. Obasaju was preparing the embryos for implantation in Mrs. Fasano, he realized the mistake he had made. Despite the labelling of each petri dish, Dr. Obasaju had prepared and filled the embryo transfer catheter with the four low-grade embryos of Mrs. Perry-Rogers; yet it was Mrs. Fasano that was currently waiting for implantation. To accommodate his mistake, Dr. Obasaju prepared the

Winner of the 2018 Student Writers Scholarship



This scholarship, sponsored by Craig Kelman & Associates, encourages student members of Engineers Geoscientists Manitoba to engage with the Association's quarterly magazine by submitting an article they have written. As well as having their article featured in *The Keystone Professional*, one student each year will receive \$500 towards their engineering and geoscience studies.

four embryos he had chosen for Mrs. Fasano and additionally suctioned these embryos into the embryo transfer catheter. Without informing her of his actions, Dr. Obasaju handed the embryo transfer catheter to Dr. Nash, who then implanted the embryos into Mrs. Fasano; four of her own embryos, and four from Mrs. Perry-Rogers.

When Dr. Nash notified Dr. Obasaju that Mrs. Fasano was pregnant, Dr. Obasaju had no choice but to inform Dr. Nash of his mistake. It is possible that Dr. Obasaju's mistake could have gone unnoticed if it were not for the fact that Mrs. Fasano and her husband were white, while Mrs. Perry-Rogers and her husband were black.

Mrs. Fasano gave birth to two baby boys on December 28, 1998; one of her own genetic makeup and one of Mrs. Perry Rogers. Upon the birth of the boys, multiple lawsuits arose. It was eventually decided that Mrs. Perry-Rogers would obtain permanent custody over her biological son, yet be required to arrange visitations for the following two months with Mrs. Fasano. Dr. Nash was charged for failing to properly supervise Dr. Obasaju and his practices, as well as for violating the confidentiality of Mrs. Fasano by releasing her identity to Mrs. Perry-Rogers. Furthermore, Dr. Obasaju was charged for multiple violations in handling the embryos and was ultimately excused from practicing embryology at IVF New York.

This story demonstrates a common ethical dilemma, the conflict between either prioritizing one's reputation or one's ethics. In human nature, and thus in any workplace involving people, mistakes are inevitable. What is important to understand is that a mistake in itself is not unethical. What may be unethical is how the mistake is dealt with. In the engineering profession, mistakes have an especially large impact on specific projects, as well as on society as a whole. This influence gives engineers the responsibility to take measures to reduce mistakes made, and to address mistakes properly when they are made. In this story, despite having the opportunity to fix his mistake before it had extensive consequences, Dr. Obasaju consciously chose to disregard proper practices and put his own interests ahead of those of the two families affected. Steven Casey describes that, "Dr. Obasaju recognized his most recent error."¹

This is a clear example of both moral and professional wrongdoing, since Dr. Obasaju was aware of his mistake and did not properly report or address it. In addition, Steven Casey also explains that this particular situation could have been avoided, had Dr. Obasaju been following the clinic's written procedures and never had the embryos of two different women anywhere near each other¹.

There are a multitude of lessons that can be taken away from this story. Most

importantly, like other professionals, engineers have a responsibility to hold themselves and their colleagues to a high standard of ethics and professionalism. Engineers have an obligation to put the needs of society ahead of personal wants or needs. The second fundamental canon of the *Code of Ethics for the Practice of Professional Engineering and Professional Geoscience* states, "Each practitioner shall regard the physical, economic and environmental well-being of the public as the paramount responsibility in all aspects of professional engineering and professional geoscientific work."² This story shows firsthand the importance of honesty in the workplace, and how it contributes to the well-being of society. In the field of engineering, a small mistake can have a large impact on those involved and can extend to many others. Often, the extent of such an impact is difficult to foresee, demonstrating the importance of handling every decision with honesty, integrity, and consideration for the greater good of society.

As for any working or developing professional engineer, these lessons have to be put into practice in order to be effective. While holding oneself accountable, it is equally important to hold fellow practitioners and colleagues accountable for following the standards in place. Because mistakes are impossible to avoid entirely, it is important to implement the available engineering knowledge to reduce mistakes and their effects on society. If nothing else, acknowledging one's mistake in a timely matter is a crucial element in reducing its impact and can save considerable time, money, and lives.

References

- ¹ Casey, S. 2006. *The Atomic Chef And Other True Tales of Design, Technology, and Human Error*. Pages 27-38. U.S.A.: Aegean Publishing Company.
- ² Engineers Geoscientists Manitoba. 2017. <http://www.EngGeoMB.ca/ActBylawsCode.html> (2017/11/26). ⊕

JESSIE ROBERTSON, 2018 Student Writers Scholarship Recipient



Jessie Robertson is a second-year student enrolled in the Department of Biosystems Engineering at the University of Manitoba. For the past two years of her engineering degree, Jessie has been a member of the Socials Directorship of the University of Manitoba Engineering Society. Jessie is passionate about studying the medical applications of engineering and is pursuing a specialization in biomedical engineering.



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A Celebration of Women in Engineering

By M. Lepage

On March 10, 2018, WISE Kid-Netic Energy and the Faculty of Engineering celebrated International Women's Day by hosting Make Your Move – a celebration of women in engineering.

WISE Kid-Netic Energy is a community outreach program specializing in science and engineering content. As the largest outreach program at the University of Manitoba, they reach 25,000-35,000 youth annually through workshops, campus, clubs, and special events – Make Your Move being one shining example.

The event brought together 60 students in grade 8 from 16 different schools in Manitoba, and 20 professional engineers to mentor and champion teams in a competitive engineering design challenge.

Students were nominated by their school divisions and teachers as girls who had shown qualities of leadership and interest in science topics, but who had not necessarily placed engineering on their radar. Mentors were women industry leaders with expertise spanning many engineering disciplines and the group included several U of M Faculty of Engineering and WISE Kid-Netic alumnae.

Many of the participating mentors were able to use the event towards the mandatory volunteer component of their licensure. It was also an opportunity to share their knowledge and support the next generation of potential engineers, at a critical time in the students' education and career decision path.

The event was energetic, with a race to a communal supply 'buffet', a surging time limit, and prizes adding impulse to the challenge - all set to the beats of an in-house DJ and running commentary from MC Nesta Matthews. However, the competitive element came secondary to the atmosphere of teamwork and reciprocity that the event encouraged. Participants said they appreciated being in a space where they felt comfortable voicing their ideas and working together with their group on a problem. "I liked how everyone was so empowering and positive, and how we supported each other. It was also so cool to see such a diverse group of individuals work together. Our mentors were





fun and encouraging and very creative,” remarked one of the student participants.

Make Your Move was also a place for students to learn practical information about the engineering profession and to gain exposure to real world engineering problems. This year’s challenge was to build an assistive device to aid in extending a person’s reach and ability to grip, carry, and release objects. “I learned the types of engineering, and what engineers do. I also learned that engineers help people a lot more than I thought,” noted one of the students who attended the event. Her thoughts were echoed by one of the mentors, who said, “I loved how the design activity showed a different side of engineering - it’s not just about trains, planes, bridges, and automobiles!”

Teams were sponsored by leading engineering industry members in Manitoba: Price Industries, Standard Aero, Boeing, New Flyer, MacDon, Magellan, Stantec, Emergent Biosolutions, Hatch, Manitoba Hydro, RTDS, KGS Group, FWS Group, Dillon Consulting, NSERC Chair for Women in Science and Engineering, Engineering Access Program, Red River College, and the University of Manitoba Faculty of Engineering all contributed to the students learning about engineering in the real world.

In a field where less than 20 percent of newly registered engineers in Manitoba each year are women, events like this aim to create some momentum towards a future where a greater diversity of individuals are valued and can thrive in engineering.

The quality of the designs that came out of the event and the students’ enthusiasm about their participation are all testament to the fact that the interest, creativity, and ability is there for these girls to succeed, but greater concerted effort from those already in the field is needed to include and support these emerging minds.

After Make Your Move’s fifth year in 2018, participants from the first iteration of the event are now of the age where they may be starting to enter university. As the Faculty of Engineering continues its growth in diversity, WISE Kid-Netic energy is proud to be one contributing piece of this change. ⊕



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IPAC Summer Picnic

By E. Fernandez, P.Eng.

Last summer, on August 19, the four ethnic-based chapters of Engineers Geoscientists Manitoba hosted a free event for their members, families, and friends at St. Vital Park, coined the “IPAC Summer Picnic”. IPAC is an acronym representing these chapters – India, Philippines (Filipino), Arab, and Chinese.

The chapter chairs, Vaibhav Banthia of India, Ethel Fernandez of Filipino, Mohamed Matar of Arab, and Wing-Keat Wong of Chinese, collaborated and organized the event through meetings, phone calls, and emails. The collaboration was motivated by the objectives to support fellow immigrants by reinforcing the importance of inclusiveness. The event will also serve as a reminder that one of the reasons the ethnic-based chapters were formed was to provide professional contacts and resources to professional immigrants in their fields and backgrounds.

Wing-Keat Wong, P.Eng., the appointed lead for the event, officially welcomed the participants with a short introductory message, thanking all organizers, volunteers, and sponsors. He also provided a brief overview of what everyone could expect at the event. Grant

Koropatnick, P.Eng., FEC, Association CEO & Registrar, graced the event and addressed the crowd with a brief, but meaningful, message.

Over 100 participants, comprised of children, youth, middle-aged, and seniors attended the event. Volunteers helped out in welcoming guests, putting up tents, setting the table, serving food, administering the games, and taking photos. Exchanging of warm greetings among members extended into conversations about adapting to life in Canada, sharing their experiences, and offering advice and guidance to those just starting their academic credentials recognition with the Association.

The kids and adults alike had a lot of fun with the games prepared by volunteers and prizes donated by the generous sponsors, National Bank and Ms. Jane He.

Everyone feasted on food brought by members, who took pride in sharing stories from their respective countries and cultures.

Participants expressed their gratitude and commented they had a great time at the picnic. “It has been a fun day and it was nice meeting members and families of other chapters. Looking forward to more collaboration for the best of our members and to all engineers,” said Mohamed Matar, P.Eng., Arab Members Chapter Chair. “We should seriously consider making this an annual event,” said Vaibhav Banthia, P.Eng., India Members Chapter Chair.

Indeed, the event was a successful social gathering which empowered cultural learning, professional networking, and respect for everyone at the event who calls Manitoba home.

Watch out for a bigger IPAC summer picnic this year in August, and of course, everyone is welcome to join. ☺



Building the Archives

By The Heritage Committee

Do you have a collection of engineering or geoscience related photos about a project that is dear to your heart? Would you like to get them scanned and archived, so that the rest of our membership and the public could also enjoy them and appreciate the work of our profession?

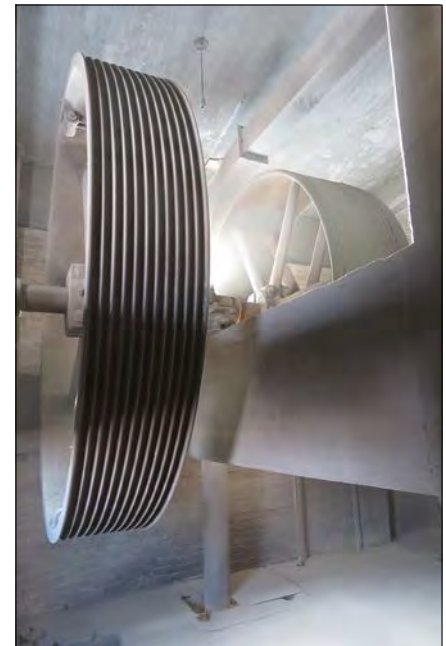
The Heritage Committee has tried to pique the interest of the membership about photos over the last year and we still believe there are a lot of gold mines of photos out there, waiting to be discovered and mined. The committee is ramping up its efforts to grow its online collection of important projects and people by soliciting those private photo collections that surely exist out in the world. The photos will be a key part of an ambitious book project that the committee is working on to celebrate the centennial of Engineers Geoscientists Manitoba in 2020.

Check out the 1950s and 1960s Construction Photo Gallery for the wiki on the Kelsey Generating Station (http://heritage.apegm.mb.ca/index.php/kelsey_generating_station). The gallery was added in the last year, as an example of what can be done. Maybe you have a similar collection that you would like to share.

The committee is currently working on finding a way to share a large collection of re-construction photos from the foundation failure and righting of the Transcona grain elevator in 1913. The project has been written about several times over the years¹ however, because the original manuscripts were not necessarily available to convert to Adobe PDFs, copies have been made with less than ideal photos, or photos that have been copied from hard copy so many

times the quality has diminished to the point that the photos are not very legible. The committee began networking with a local subject-matter expert and then initiated discussions on how to make the construction photos available on the Heritage Wiki. These discussions are timely as the subject-matter expert is fortunate enough to have had access to the original photos and had already preserved them. The committee is simply acting in a timely fashion to add them to the Heritage Wiki site. There is no better time than today to preserve those old photos, so send us a note at Heritage@EngGeoMB.ca. We would love to hear from you and help preserve more of our shared heritage.

¹ *The Failure and Righting of the Transcona Grain Elevator*, Canadian Geotechnical Society www.cgs.ca/pdf/110928%20Introduction%20and%20papers.pdf Ⓢ



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KEYSTONE PROFESSIONAL Committee

By C. Cousin, P.Eng.

The Keystone Professional Committee is responsible for the publication of the Association’s quarterly magazine, which serves as a source of information for the membership. Work completed by committee members includes planning for the publication of *The Keystone Professional* in advance to ensure that content is interesting and relevant, writing and soliciting articles for inclusion in the magazine, and editing the selected content. Feedback on the magazine is always welcome as we work to continually improve *The Keystone Professional*, and all members are encouraged to submit ideas for content and articles to be considered for inclusion in future issues.

The committee currently consists of eight members, and the Association strives to maintain diversity within

the committee reflective of the wide range of education and experience of the engineers and geoscientists we represent. The members of the current committee certainly meet this goal, with our membership covering a wide range of ages and career stages; men and women; working in different market sectors including government, industry, and private sector employers; and both engineers and geoscientists. The result of such diversity in a small group is interesting to see in action, for example considering how an article can be interpreted very differently due to our individual perspectives, both personal and professional.

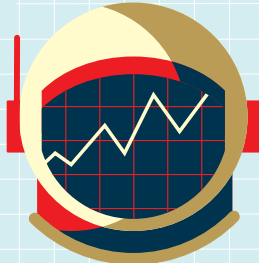
Take a close look at the opposite page, which is from the very first issue of *The Manitoba Professional Engineer*, published by the Association in July 1956. The


photograph shows the membership of the 1956 Council, likely representative of the Association at that time - a little more homogeneity perhaps? Over the 62 years since this first issue, the Association has continued to publish a magazine to maintain communications with its membership, although the format and frequency have varied over time. Engineers Geoscientists Manitoba is looking forward to a very special milestone in March 2020, as we reach the centennial of incorporation of our Association. Leading up to the centennial, *The Keystone Professional* will be reaching back into the archives with the intent of sharing another gem from the past in each issue. Celebrating where we came from as an Association, understanding where we are now, and looking forward to the next 100 years will be exciting! ☺

“Feedback on the magazine is always welcome as we work to continually improve *The Keystone Professional*, and all members are encouraged to submit ideas for content and articles to be considered for inclusion in future issues.”

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No. 1



Members of the 1956 Council at a Recent Council Meeting: (Reading clockwise)—

J. HOGSTRATEN (left end) L. A. BATEMAN W. L. WARDROP R. N. SHARPE C. S. LANDON D. M. STEPHENS N. S. BUBBIS

ANOTHER STEP FORWARD

With the publication of this issue, the Association of Professional Engineers of the Province of Manitoba takes another great step forward.

This Association, incorporated March 27, 1920, held its first general meeting in September of the same year. Seventy-one Registered Professional Engineers were present and M. A. Lyons, P. Burke-Gaffney, G. L. Guy, J. G. LeGrand, A. W. Smith, D. A. Ross and W. P. Breerton were elected to the first Council.

M. A. Lyons, who is residing in Toronto and is now a life-member of this Association, was the first President.

Under the capable direction of Jack Hoogstraten, P. Eng., one of the few persons ever to serve two years as President, the Association has already made great strides this year and 1956 will go down in the history of this Association as a year of great achievement. The Association opened its own offices in January, and this has resulted in increased activity and has stimulated interest on the part of the members.

Assisted by N. S. Bubbis, P. Eng., the Association's Vice-President, who is liaison officer between Council and the Public Relations Committee, this Committee laid the groundwork for the publication of *The Manitoba Professional Engineer* and named G. T. Christie, P. Eng., as editor. Mr. Christie will be assisted by W. H. Dickins as Managing Editor and E. M. Scott, P. Eng., and D. E. Haig, P. Eng., who have been named Associate Editors. The success of this venture depends on the interest taken and assistance offered by members of the Association.—D.M.L.

Call to Action: The Parental Leave Gap

By J. Blatz, P.Eng., FEC

The 2018 Canadian Federal Budget provides historic investments in programs that support gender equality in the workplace and this is certainly timely given the Engineers Canada 30 by 30 goal and the recent Engineers Geoscientists Manitoba launch of the “Engineering Changes Lives” initiative. The 30 by 30 goal, established by Engineers Canada and supported by provincial regulatory bodies across the country, aims to raise the percentage of newly licensed engineers who are women to 30 percent by 2030. Currently, this figure is at 15.1 percent in Manitoba. There are now tangible investments and policy changes that will help address systemic barriers to equal gender participation in our engineering and geoscience professions. As these new directives unfold and the government and our Association take specific actions to effect change, it is worthwhile to reflect on how employers are internally responding in their own organizations, particularly in the private sector.

There has been an increasing focus on ensuring young women in high school,

and earlier, are identifying engineering and geosciences as rewarding careers where gender equality is celebrated, as it not only provides an improved diversity of capabilities and viewpoints in the workplace, but ensures that the profession reflects the gender diversity of a broader society. This is an essential element in increasing the participation of women. But, what about the efforts to ensure that support continues post-graduation in the early portion of individual’s careers?

One of the most notable challenges early-stage practitioners face, both women and men, is the work-life balance associated with having a young family, for those that choose to do so. The statistics are clear that the disparity in career progression begins to diverge at the point where maternity or paternity leave decisions are made. In large part, maternity leaves are taken by our female colleagues and there are some startling impacts on their careers that can result.

The first, and most substantial, consideration is that ‘leave top-ups’ in our profession are woefully lacking. The exception to this is the government sector that tends to offer standardized

programs across all departments. A survey of the private sector shows a majority of employers provide little to no top-up in a profession where capped Employment Insurance benefits are clearly not adequate to replace the salary level of practicing professionals. The signal this sends is not positive and certainly places a financial burden on our professional colleagues who choose to take that necessary time to support their families.

A second notable impact is that employees on leave are immediately, and often completely, disconnected from their professional activities with removal of email, mobile phone, and information access. Although this is often couched in terms of a regulatory requirement for Employment Insurance, it leaves employees disconnected from work efforts and abandoned from their projects.

Lastly, the return to work transition can be wanting at best, with limited formal efforts to ensure a smooth transition from a period of leave. The majority of women and men who take leave forego a salary increase, even a modest cost of living adjustment, putting them further behind financially and recognizing their peers have moved forward in their careers more quickly, having not taken a similar leave.

All of these considerations are certainly disheartening and contribute to what many refer to as early-career-stage leakage of women from our professions. Engineers Geoscientists Manitoba has funded an important research project led by Kathryn Atamanchuk, P.Eng., as graduate student, and Dr. Marcia Friesen, P.Eng., FEC, as supervisor, to move this discussion from anecdotes to data on the “leaky pipeline” consideration. The results may be a first in Canada and will begin to expose this important issue so that it can be addressed directly.



As a profession, we can do better. We don't need the formal data to acknowledge these concerns and begin the conversation within our organizations as to how to better support our professional colleagues who take time away for family. The financial support to minimize that impact during the leave is the simple part. Organizations need to develop policies to financially support both women and men who choose to take leave, to lessen the financial burden of that decision and reflect that it is a cost of doing business.

Connectivity during leaves through the opportunity to voluntarily be involved in meetings via Skype, teleconference, or other technologies, as well as being copied in on project updates, at the employee's discretion, is easily accommodated and a simple arrangement that this is done on a voluntary basis, without ties to top-up remuneration, to ensure regulatory compliance. This approach also, in part, supports an improved return-to-work experience that can be enhanced with other efforts. Engineers Canada has published a valuable resource entitled *Managing Transitions: Before, During and After Leave*¹ that offers important advice for all elements of a planned leave for both employers and employees.

Beyond the obvious impacts, it is also important to continually assess our organizational culture to ensure unconscious bias isn't creeping into behaviour, so that colleagues having to leave on strict schedules to fulfill family obligations are not perceived as lacking loyalty or commitment to their professional activities. The idea of part-time and flex-time employment arrangements can be implemented quite easily with the use of technology and some creative thinking regarding workflow assignments. However, this must also be practical in ensuring that the actual work requirements are not simply a full-time level with part-time compensation.

This is an exciting time for the profession as the government and our Association are clearly on the same path of providing resources and thinking


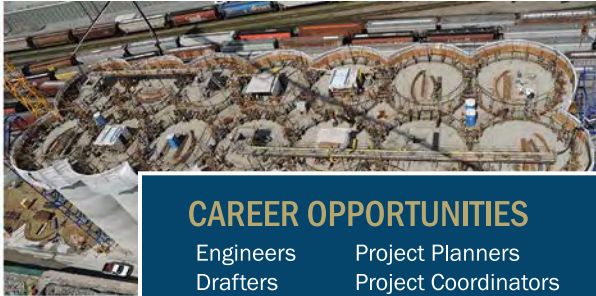
seriously about how to improve gender equity in the workforce. This article is focused on only one of many challenges to achieving gender equity for those colleagues who choose to raise a family. As Engineers Geoscientists Manitoba takes a leading role nationally in achieving the national Engineers Canada 30 by 30 goal, there is an opportunity for all organizations employing professional

engineers and geoscientists to reflect internally on how to contribute to this important effort. Now is the time to demonstrate what we all can agree on, which is that engineers and geoscientist are capable of solving any problem. It's time to get to work on this issue.

¹ <https://engineerscanada.ca/sites/default/files/Managing-Transitions-en.pdf>


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Grand Opening of Expanded Association Office

Having taken the opportunity for growth in 2017 by expanding its office into newly vacant premises on the second floor, the Association marked the official opening of the new space with a ribbon cutting ceremony on Friday, February 23, 2018.

Representatives involved in the renovation gathered with councillors, staff, and special guests to mark the occasion in the new Wardrop Boardroom.

In honour of their achievements and their impact on engineering in Manitoba, the four boardrooms on the second floor are named after prominent engineers in the province: Landon, Lyons, Wardrop, and Weizsmann. The Association was privileged to be joined by some of their family and friends for this special occasion.

CEO & Registrar Grant Koropatnick, P.Eng., FEC, introduced special guests Ann Weizsmann, daughter of the late Judith Weizsmann, P.Eng., FEC, and Terry

Wardrop, son of the late Les Wardrop, P.Eng., FEC, who shared fond memories of their parents and their engineering legacies. Along with President Jonathan Epp, P.Eng., FEC, they cut the ribbon to mark the official opening of the expanded space.

Following the ceremony, the Association welcomed visitors into its new space during an open house afternoon, where 30 practitioners joined staff for tours of the new facilities. ☕

“In honour of their achievements and their impact on engineering in Manitoba, the four boardrooms on the second floor are named after prominent engineers in the province: Landon, Lyons, Wardrop, and Weizsmann”



Family of Les Wardrop, P.Eng., FEC, in the Wardrop Boardroom.



L-R: Grant Koropatnick, P.Eng., FEC, Terry Wardrop, Ann Weizsmann, and Jonathan Epp, P.Eng., FEC.

Ann Weizsmann with the portrait of her mother, Judith Weizsmann, P.Eng., FEC, in the Weizsmann Boardroom.



Terry Wardrop shares memories of his father at the ribbon cutting ceremony.

Winnipeg U of M Team Creates Best Way to Mine an Asteroid

Twelve students from the University of Manitoba Faculty of Engineering represented the University of Manitoba at the 2018 Canadian Engineering Competition, which was hosted by Ryerson University from March 8-11.

The Programming Team placed first overall. Team members included final year students Austin Shaski (computer engineering), Chelsea Taylor (computer engineering), Cole Bouchard (computer engineering), and Matthew Kehler (electrical engineering).

This was the first year that the programming competition was held at the Canadian Engineering Competition. Six teams from across Canada competed this year.

The Re-Engineering Team placed second overall. Team members included Dayakarn Sandhu (electrical engineering) and Nick Couture (mechanical engineering).


IN THEIR WORDS

Computer engineering student Austin Shaski explains the competition:

“The problem given to our team was to build an application that manages the autonomous mining of an asteroid belt, with the overall objective of maximizing profits. We had to interface with a simulated mining environment, set up by the conception organizers, via JSON formatted HTTP requests. Using these requests, we were able to perform operations such as building mining hubs, receiving prospecting reports, and

scheduling the transportation of mined ore.

“Our team’s approach to the problem was to create a system that achieved a profit as fast as possible, then to make improvements from there. We selected this approach as we realized the technical complexity of the problem for the limited time frame. We chose to implement this solution in the C programming language, due to our team’s previous embedded software experience. With this solution we were able to deploy more mining hubs to profitable regions of the asteroid belt than any other team.”

From news.umanitoba.ca 


“Engineering Changes Lives” Initial Insights Panel Discussion

Engineers Geoscientists Manitoba has a goal: 30 by 30. By 2030, 30 per cent of newly licensed engineers will be women. That’s double the current rate. The Association knows this goal can’t be met without a significant, long-term commitment and has budgeted an initial \$800,000 for the

first phase of this initiative, one that’s meant to reach young women who could be the next decade’s graduating class in engineering.

Minister responsible for Status of Women, Hon. Rochelle Squires, addressed a full room at the Manitoba Legislative Building on Monday, April 30.

Over 100 government officials, engineers, and educators were in attendance for a panel discussion exploring the culprits that steer girls away from STEM and nudge women out of the engineering profession. Culprits ranging from unconscious gender bias in teaching math and science from a young age and societal gender expectations, to a lack of role models both in the profession and in the media were identified. The engineers on the panel then shared their personal experiences.

Included as part of the panel discussion was the launch of an in-school advertising campaign inviting collaboration between Manitoba’s middle school students and the province’s largest engineering employers to address the barriers that keep girls from choosing engineering as a career. 



Panelists take questions from the audience.

L-R: Sarah Stringer, Juliet Creative, Jonathan Epp, P.Eng., FEC, President of Engineers Geoscientists Manitoba, Lindsay Melvin, P.Eng., FEC, Past President of Engineers Geoscientists Manitoba, and Nusraat Masood, EIT, WISE Kid-Netic Energy Program Administrator.

2018 ACEC-MB Awards Gala

The Association of Consulting Engineering Companies Manitoba (ACEC-MB) honoured excellence in engineering and celebrated the 40th year of ACEC-MB at their 19th annual awards gala on April 10.

The top prize for the evening, the Keystone Award, went to Winnipeg-based KGS Group for the Peter Sutherland Sr. Generating Station project, a 28-megawatt hydroelectric facility located in northeastern Ontario.

Awards of Excellence were presented for projects submitted by AECOM, Dillon, Hatch, KGS Group, SMS Engineering, SNC Lavalin, Stantec, and Tetra Tech. AECOM, Dillon, KGS

Group, Stantec, Tetra Tech, and Wood also received Awards of Merit.

Doug Stewart, P.Eng., was presented the Lifetime Achievement Award and WSP's Misty Klassen, P.Eng., received the Rising Star Award. The Engineering Action award was presented to Allyson Desgroseilliers, P.Eng., a senior associate environmental

engineer with Wood (formerly Amec Foster Wheeler) and a past-president of ACEC-MB.

ACEC-MB's mission is to promote the business interests of the consulting engineers of Manitoba and to promote the application of engineering for the benefit of society. Further information can be found on www.acec-mb.ca.



Photo Credit: Julie Remillard Photography

Winnipeg Research Satellite Heading to Space

A team of university students from Winnipeg have been selected as one of fifteen teams from across Canada to receive between \$200,000 and \$250,000 from the Canadian Space Agency to design and build their satellites.

The teams will launch "cubesats" into space – small square satellites that can carry whatever sensors, cameras or computers researchers manage to squeeze inside. Each cube is small enough to fit in an adult hand but they can be assembled together like Lego blocks to accommodate bigger projects.

Impetus for the Winnipeg team's

satellite project started while a group of engineering students were still in undergrad, designing satellites "for fun," says Matt Driedger, EIT, an engineering doctoral student at the University of Manitoba. When he and the other members of the University of Manitoba Space Applications and Technology Society start working on the space-ready satellite this summer, it will be their fifth attempt at building a satellite.

One of the biggest challenges for the team is fitting in all the components they need, like batteries and computer chips, into the cubesat – which come in standard-

sized blocks. The team uses 3D plastic models to ensure everything, including the bolts and screws, can fit. Their mission will be sending up rocks and minerals, including moon rocks and small meteorites, to see how the substances change in space. Researchers already know a lot about how synthetic materials age in space because humans have sent up so many satellites over the years. But natural materials are still a bit of a mystery. The researchers will be looking at how things like space radiation, atomic oxygen, and micro-meteorites affect the materials.

The Winnipeg team's satellite is expected to go up into space on a supply mission to the International Space Station in two to three years. After that, it will last in space for about a year, sending data back down to Earth, before falling out of orbit and burning up in the atmosphere.

Adapted from CBC News Article, May 4, 2018. www.cbc.ca/news/canada/manitoba/satellite-winnipeg-astronaut-1.4649544



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11th Annual Bike to Work Day

Ditch the car and grab life by the handlebars for Winnipeg's 2018 Bike to Work Day, on June 18! Make sure to join us at the Engineers Geoscientists Manitoba pit stop, co-hosted by Dillon Consulting, on your way in to work. We'll be outside the office at 870 Pembina Highway (northbound

Pembina at Harrow), from 6.30 a.m.–9 a.m. with water, snacks, and more!

Whether you are trying it for the first time or it's your thousandth time biking to work, we want to make your commute more enjoyable. So trade your four wheels for two and join the 2018 Bike to Work Day!

See www.bikeweekwinnipeg.com for more information on all the events happening during this year's Bike Week Winnipeg.



Petr Cerny

January 8, 1934 - April 7, 2018



Dr. Petr Cerny passed away peacefully earlier this spring at the age of 84, following a lengthy battle with Parkinson's disease. After earning his graduate degrees in geology in his home of Czechoslovakia,

Dr. Cerny progressed at the University of Manitoba from a postdoctoral fellow through to professor of geology, and eventually to the designation of Professor Emeritus. Dr. Cerny was a world-renowned expert in mineralogy and geochemistry, particularly in the field of granitic pegmatites. His prolific

research spanned sixty years, and he was principally well known for his research on the Tanco mine and other pegmatites in southeastern Manitoba. His impact on science was celebrated by the naming of the mineral 'cernyite' in his honour. ☯

DO YOU NEED HELP?

Are you experiencing job loss or some other event that has created stress in your life? Many professional members in Alberta have experienced job loss due to the economic downturn caused by low oil prices. Although the Manitoba economy is not experiencing the same conditions, Engineers Geoscientists Manitoba has a list of support services that you may find helpful. Do you need help with any of these?

- Job loss
- Career change
- Change in health
- Personal conflict
- Death of a family member
- Financial pressure
- Mediating a dispute
- Personal decision making

For a comprehensive list of member support services visit www.EngGeoMB.ca/SupportServices.html

In addition to the Engineers Geoscientists Manitoba list, contact the Human Resources department at your workplace or EAP (employee assistance program) representative if you have benefits.



Practice Notes – Limit States Design and Site Reviews

The past few years have seen unprecedented volume for the Investigation Committee. Procedural changes are under way to assist the Investigation Committee in dealing with this increase in workload. In the interim, they have been busy working away at all of their duties, including the development of practice notes.

Practice notes are developed by the Investigation Committee and published on the Engineers Geoscientists Manitoba website. In November, the committee finalized a note regarding site reviews, which covers several issues. In April, they put out a practice note on limit states design.

Limit States Design

In the second half of 2017, Engineers Geoscientists Manitoba became aware that authorities having jurisdiction (e.g. Office of the Fire Commissioner, City of Winnipeg) were taking issue with design methodology being used by some of our practitioners. The design philosophy in question attempted to work from a prescriptive design for piles and back-calculate a generic soil capacity. Some practitioners were then using this derived soil capacity to design foundations.

In this practice note, the Investigation Committee makes it clear that this methodology is not considered good engineering practice. In addition, all

practitioners are reminded that the limit states design (LSD) method is the only acceptable method for building structures, including all foundations. The Manitoba Building Code does provide a prescriptive pile design specific to residential garages. Other than this application, the use of a design method other than LSD (e.g. allowable working stress) is not permitted.

Site Reviews

Over several years and through multiple investigations, the Investigation Committee noticed that there was a collection of instances of professional misconduct that related to the review of construction for engineered buildings. Over many months, the committee worked to develop a practice note that covered the various concerns that they observed around this general topic. This work was finalized through the publication of the practice note at the end of 2017. The topics covered in this practice note include:

1. The expectation of a designer to review construction for their designs,
2. Record-keeping for site reviews,
3. The number of site reviews for each project,
4. Persons qualified to conduct a site review, and
5. Sources of information upon which a practitioner can rely.

1. Designer's Obligations: The Manitoba Building Code currently states that the designer of a building, or someone responsible to the designer, must conduct site reviews. The Investigation Committee recognizes, however, that there are instances where a practitioner may have designed a building, but would not be professionally obligated to perform the site reviews. One example is where the client has engaged an engineer other than the designer for site review services. Another example is where a practitioner was explicitly engaged only to provide a design.

In the scenarios above, the Investigation Committee would not normally consider it professional misconduct if a practitioner failed to perform site reviews. The practice note provides details on how to navigate these scenarios. In all other instances, though, there is an expectation that a designer takes responsibility for the review of construction for their designs.

2. Record-Keeping: The Investigation Committee reminds practitioners that proper record-keeping is fundamental to the site review process. Practitioners should, at a minimum, maintain a permanent record of the date/time that they performed a site review as well as a summary of their observations. Any directions provided on-site should also be recorded and provided in writing to the appropriate parties. Photographs can also be essential. The above advice is echoed regularly by providers of professional liability insurance, too.

3. Number of Reviews: We are asked regularly to establish a minimum number of site reviews required to properly fulfill the practitioner's obligations. However, the vast range of project complexity makes it impossible to establish a minimum number. Generally, engineers

Practice notes are developed by the Investigation Committee and published on the Engineers Geoscientists Manitoba website. In November, the committee finalized a note regarding site reviews, which covers several issues. In April, they put out a practice note on limit states design.

should review construction immediately prior to any stage where work will be covered up and will no longer be directly accessible for inspection. It is also a good idea to provide a list of these stages in advance so that contractors are aware of the times where they must have the practitioner perform the next site review.

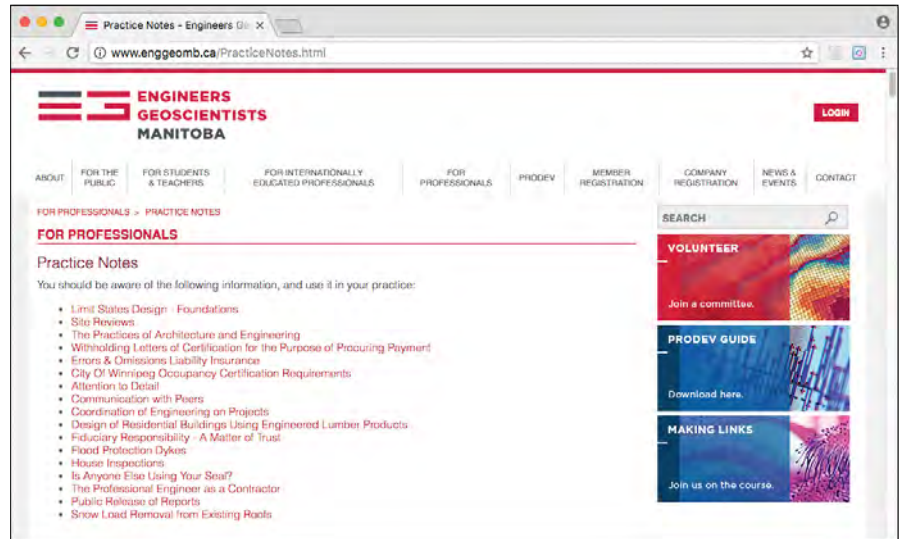
4. Qualified Persons: Where site reviews are delegated to others, practitioners should ensure that the level of supervision and guidance matches the skill and experience of the reviewer.

5. External Sources: In almost all situations, practitioners should either perform site reviews directly, rely on qualified people from their company, or rely on information from an independent third party. Only in an extraordinary circumstance would it be appropriate for a practitioner to rely on information provided by the contractor or building owner.

An example of an extraordinary circumstance might be one where a concrete pour is about to occur in a remote location and, while en route, the practitioner is unexpectedly prevented from making it to the site. The practitioner could choose to rely then on information from the contractor but should be very cautious in doing so and should consider all of the factors, including the amount to which they trust the contractor.

The two practice notes described above can be found, along with all of the published notes, on our website at: www.EngGeoMB.ca/PracticeNotes.html.

As always, I appreciate comments and discussion about standards issues. If you'd like to talk about the above topic or any other area of concern, please do not hesitate to contact me at MGregoire@EngGeoMB.ca.



The Continuing Competency Committee (CCC) is looking to assist practitioners with improving the quality of ProDev activity submissions. In order to achieve this, they will be looking at anonymized data from individual ProDev records. Based on the observations of this anonymous data, the CCC will look to develop guidance and advice for practitioners that will be provided in the future. If you have any questions, please contact MGregoire@EngGeoMB.ca.

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A photograph of three students standing in a modern building atrium. On the left is a man with dark hair and a beard, wearing a dark blue sweater. In the center is a man with a beard, wearing a dark suit and tie. On the right is a woman with long blonde hair, wearing a dark blue blazer and pants. The background shows a multi-level atrium with glass railings and people walking.

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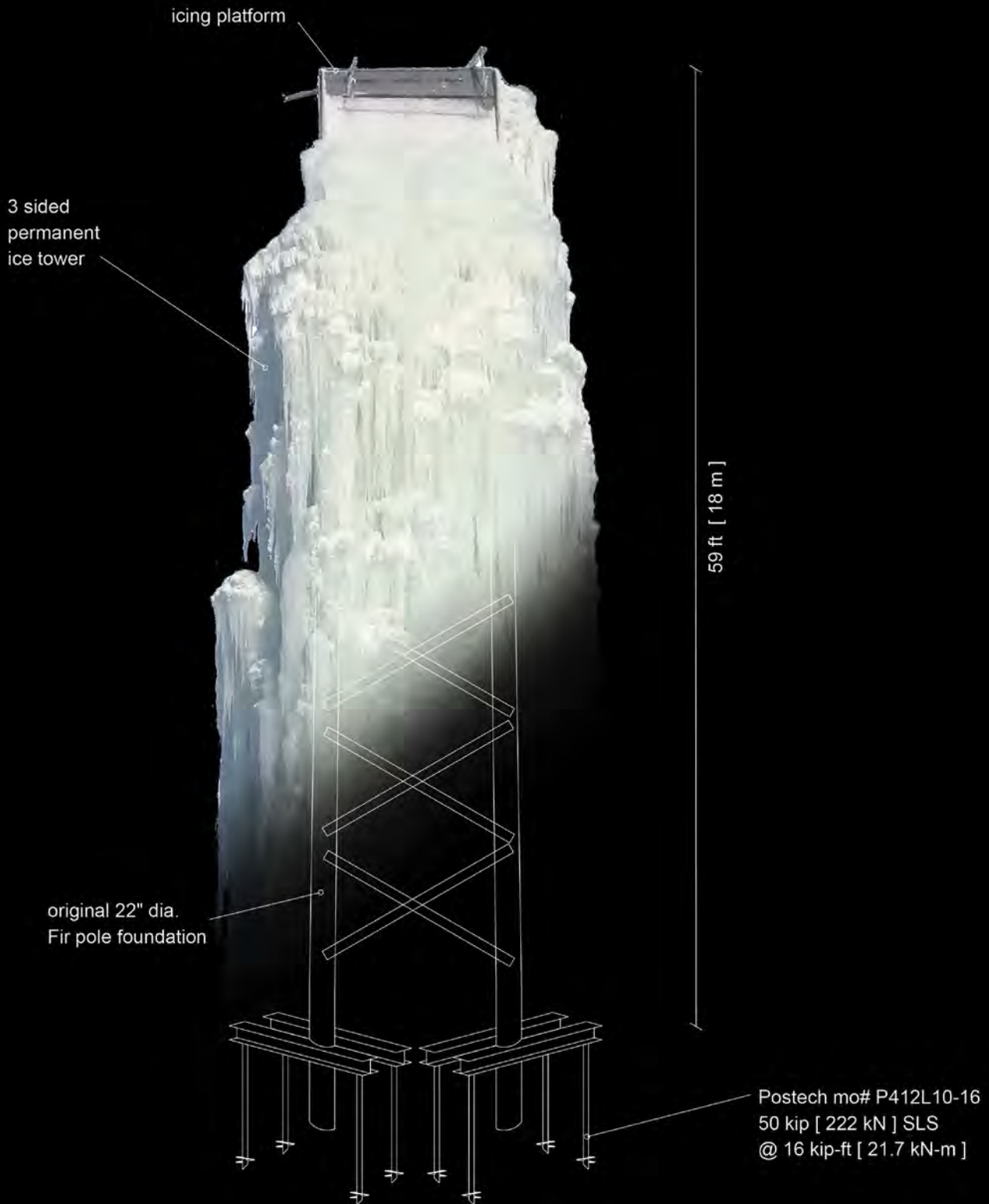
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