The official publication of the Association of Professional Engineers and Geoscientists of the Province of Manitoba

THE KEYSTONE PROFESSIONAL

SPRING 2013

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APEGM

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Dawn Nedohin-Macek

Strong Ethical **Base in Manitoba**

When we write our Professional Practice Exam at the end of our 48 month member-in-training period, we spend time reading, reviewing, and learning about ethical behavior, contract law, patents, trademarks, and industrial design. When we are done, those textbooks go up on the shelf – or back to whomever we borrowed them from. How often do we go back and review the law or ethics requirements for professional behavior? If you are in the construction industry or constantly writing contracts, I am sure you revert back to contract law to be sure your contracts are valid and legal.

Ethics is different. Ethics are day-to-day behavior and practices and shape all of our interactions within the engineering and geosciences professions. Without a strong ethical basis, we could not be sure that our engineering designs or our prospecting reports are accepted as accurate and true. Our professional designation and the seal we put on our drawings and reports separate us from the general public, by indicating that a Professional Engineer or Professional Geoscientist reviewed and takes ownership of it. To the public, this ownership mark conveys not only technical competence and knowledge, but ethical behavior. They place their trust in us.

Recently the Charbonneau Commission in Quebec has uncovered business practices that are far from ethical. The Ordre des ingénieurs du Québec (OIQ) stepped out in front of the controversy and has an aggressive public education campaign aimed at informing the public why there is regulation, what professional and ethical behavior means, and is actively following up on all inquiries made into their membership. As the commission progresses, the number of OIQ investigations continues to climb. Stéphane Bilodeau, the Vice President of Public Affairs of the Ordre des ingénieurs du Québec, reported that the Charbonneau Commission has found that there are over forty engineers employed by cities, municipalities, consulting and construction firms involved. Since 2009, he reported that the Office of the Syndic has started over 800 inquiries into the ethical behavior of their membership. To accommodate such a large number, the OIQ has doubled its investigative staff and allocated over a million dollars towards the Office of the Syndic. Mr. Bilodeau noted that only one eighth of the investigations were due to technical concerns; the remainder started because of suspected or observed unethical behavior.

The Ordre des ingénieurs du Québec's strategy was three-fold: i) Do not hide, face the music, ii) Stay transparent in communications with the public, and iii) work with others to be part of the solution rather than part of the problem. This strategy has been communicated to its membership with over 300 communiqués and many public information campaigns.

"The cost of corruption could be equivalent to a big hospital, of major infrastructure." Said Mr. Bilodeau, "This is a social cost."

Stéphane Bilodeau also pointed out that many of the engineers being investigated work for companies that are Canadian or International, and have office and field operations all over Canada. The Charbonneau Commission's results will be felt throughout Canada as the public demands we prove that engineers and geoscientists are trustworthy and ethical.

Manitoba has had only 10 investigations within the last year. We have a strong ethical and professional basis here in Manitoba, and as we follow the Charbonneau Commission's findings and the OIQ's messages on ethical behavior, I believe we are in good stead to field the upcoming inquiries from the public as to our own members' ethics training and behavior. If you have any concerns or questions about whether a situation is ethical, contact the APEGM Standards Officer, Michael Gregoire.

> Without a strong ethical basis, we could not be sure that our engineering designs or our prospecting reports are accepted as accurate and true.

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Grant Koropatnick, P.Eng., Executive Director & Registrar

Twitter **Test**

I spent the weekend doing a Twitter test. What is a Twitter test you ask? Oh, that is my way of saying I am gonna check out this social medium to get a clearer idea of how it works. As a result, I carried my mobile device with me all weekend; watching the 'tweets' pouring-in.

I Am Not a Luddite

Make no mistake – I am not a 'Luddite' – a 19th century worker who was involved in protests in the United Kingdom against new factory production methods and who favoured traditional methods of work[1]. I have been using technology in the workplace since the mid-80s. I remember Microsoft Mail version one point oh. I carry an iPhone. I own an iPad. I have a widescreen with AppleTV in my family room and I play endless hours of internet radio. I get technology. I am not so sure I get Twitter though; hence my weekend 'Twitter test.'

140 Characters

I have been asking the question for about a year: Does social media have any value for a professional regulator like APEGM? That is a tricky question to answer. One professional member sitting with me at a luncheon asked me last year "Is APEGM going on Twitter?" I asked him back "Should we be on Twitter?" He replied "I don't know." The conversation around the table was telling – no one could decide whether there was value in the social medium for an organization like APEGM. As a result, I have not jumped on it. Can 140 characters communicate effectively? In some cases – Yes. In others – No. For example, I have found it to be highly effective at communicating small bits of information like flight numbers, arrival times, last minute meeting changes affecting time and location, etc. On the other hand, you would not use text, Twitter, or 140 characters to confirm a business contract clause because (in my view) they are too brief and prone to errors caused by acronyms, abbreviations, and innuendos.

Facebook Group

You may recall that APEGM was on Facebook for about three years. The APEGM group on the popular social media site had about 200 members. Some I recognized from Winnipeg. Other members were unknown faces from around the world! No kidding. I was amazed when 'Ibrahim', an engineer from Turkey, wanted to be my friend. During the Facebook group duration, I was asked many times about moving to Canada and working as an engineer in Winnipeg. The medium seemed to have value, until I realized that it was easier to find APEGM on the Internet without Facebook. There is a search engine called Google. You might have heard of it. If you type in the words 'engineer' and 'Manitoba', what appears first? Answer: APEGM.mb.ca If you do not use Google and you rely on Facebook for messaging, I become curious as to why you would not email me directly from the APEGM contacts page – just wondering.

Do not write-me-off for thinking this, but are Twitter and other social media just a digital form of gossip? Does it feed the desire to know that little bit of information about someone before everyone else does? Is it a new form of entertainment in a world saturated with entertainment? Not too long ago, pre-Internet, you went to the local coffee shop, pub or hair salon to get the scoop on a politician or celebrity. You might have picked-up the telephone and called a family member or neighbour to ask about another family member or neighbour. Is there anything new about gossip? I do not think so. Is cyber-bullying a new trend in schools? Yes. Is bullying a new trend? No. I believe we are seeing ancient human attributes manifested in current technologically advanced ways. Is it something new? Well, sort of. . . I guess, but not really. The difference is the local coffee shop or hair salon informed a few dozen people. The internet has the power to easily inform (and misinform) millions.

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I Am Following – Are You?

Although you probably can tell that I remain uncertain about the value of social media for a professional organization like APEGM, my weekend Twitter test will continue for a bit longer. I am following a range of tweets from pro athletes to daily news feeds to various regulators across Canada. Without intending any disrespect to our sister associations on Twitter, the tweets they have been sending out today are more about engineering news relays (dare I say 'trivia') from the Internet and not important regulatory information for members. However, I confess it was amazing that, through Twitter, I knew about Toronto Mayor Rob Ford's appeal victory in court, nanoseconds after the judge's gavel hit the podium. Wow, that is fast! I suppose if I were a trader on the floor of the Toronto Stock Exchange or New York Stock Exchange, I could use lightning-quick information from Twitter to gain advantage over my competition, but APEGM is not in the business of trading stock where timely information is mission critical. In fact, a slightly slower, methodical approach is safer for communicating in the regulatory world.

Respecting Your Time

In the APEGM office the staff and I have been discussing this topic in the context of respecting your time while avoiding sending you too much information (sometimes dubbed 'spam' or 'junk mail'). The last thing we want to do is pester you with superfluous details about blah, blah, blah. You get it, right? Does Twitter, Facebook, Blogger and other social media have value? Yes. Value in the social context. Do I want you to get important APEGM information? Yes. I am just not sure it will come through a social medium. We are reviewing our e-news and events news policies. Our goal is to limit the communications so that you get valuable information without feeling harassed. Have a great day!

As always, I appreciate your feedback. Do not tweet me, just send me an email on anything you read in the *Keystone Professional* magazine: *gkoropatnick@apegm.mb.ca*

[1]Encarta Online Dictionary © 2013

> I have been asking the question for about a year: Does social media have any value for a professional regulator like APEGM?

Engineering PHILOSOPHY 101

M.G.(Ron) Britton, P.Eng.

Information and Knowing

The phrase *". . . knew, or ought to have known . . .",* which precedes the specific charges in most disciplinary hearings, has always bothered me. However, my recent discovery of Louis Bucciarelli's book, Engineering Philosophy[1], pointed me in a direction I had not realized I needed to go in my understanding of why I was bothered.

Bucciarelli speaks to the distinction between information and knowing. I must admit that I had never spent much time considering this difference. To me, information was simply the material I had to know. He characterizes information as *". . . any representation, any human production which has been endowed by its authors with a disposition to provoke knowing"*. In other words, he suggests that 'Information is stuff.' We can find information in books, codes, specifications, scientific papers, web sites, drawings, and any other 'place' where 'facts' can be stored. It is the resource upon which libraries and search engines depend. Anyone can access it, but one must know how to use it.

He follows with the observation that the characterization of knowledge as 'stuff' is not reasonable. Knowledge, or as he prefers, knowing, is inspired by information. But knowing is context specific. Individuals can, and do, study similar information sources and come away with different understanding. Scientists, for example, study a body of information in order to be able to explain a phenomenon. They are intent on *knowing that*. Typically, engineers will study that same body of information in order to determine how it can be used, or with the intent of *knowing how*.

The argument suggests that knowing is inspired by, and focussed on, using information. That being the case, they cannot be one in the same. Knowing is dynamic and context sensitive while information is context independent and more or less static. Research and experience will change available information. Context will change knowing.

So, if Bucciarelli's contention regarding information and knowing is correct, and if the emphasis on *knowing how* is fundamental to being an engineer, how do we assure that current and future engineers will come to understand what is expected of them and how they need to prepare themselves to meet that expectation?

Knowing about Engineering begins with the academic background provided through undergraduate Engineering programs. Our Canadian programs are assessed against Canadian Engineering Assessment Board (CEAB) requirements. Specifically, each program must demonstrate that their graduates posses twelve fundamental 'Attributes'. *"A knowledge base for engineering"*, the first "Attribute", specifically defines areas of information *". . . appropriate to the program"*. This amounts to a mixture of *knowing that* and *knowing how*. Further down the list, under the title "Professionalism", there is a requirement for *"An understanding of the roles and responsibilities of the professional engineer . . ."*, an information based learning requirement. The remaining ten (10) 'Attributes' all require *"An ability to . . ."*. In other words, ten out of twelve CEAB attributes specifically relate to knowing, and more importantly, they relate to *knowing how*. These are relatively new expected outcomes that seem to support programs in which *knowing how* is the central focus. The jury is still out with respect to how well the CEAB intentions are being met.

Knowing about Engineering expands during the Engineer-in-Training (EIT) period that follows graduation. This involves some specific tests (information) relating to governance of the profession and legal/ethical responsibilities as well as *". . . at least four years of Acceptable Work Experience . . ." (knowing how).*

For the Professional Engineer Continuing Professional Development programs respond to the reality that new information is becoming available at an increasing rate. In order to stay current one must *know how* to use this new information. Given that *knowing how* is context based, and given that each of us has a unique context, these programs cannot be offered in 'packages', but must rely in individual initiative.

This column began with my concern about the Discipline Committee use of the statement *". . . knew, or ought to have known . . ."*. Recognizing the distinction between knowing and information seems to provide a logical base for the learning process in Engineering Education. If that is correct, and if each of us maintains that focus on knowing rather than information accumulation, APEGant its volunteers should be able to spend more time doing, and less time disciplining. After all, Engineering is about the informed application of technical information, and yes, we ought to *know how*.

> "Research and experience will change available information. Context will change knowing."

[1] *Bucciarelli, Louis L. 2003 Engineering Philosophy. Delft University Press, Delft, The Netherlands*

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Can you afford the cost of being critically ill?

Medical advances are making critical illness more survivable — but less affordable. Here's how to ease the financial burden so you can focus on what's important: your health.

"Most people buy life insurance first. But before you die, chances are you're going to get sick first."

82%	Adult Canadians who have been exposed to cancer, either personally or through a close friend or family member[2]
75%	Stroke sufferers who are left with an impairment or disability[3]
10 minutes	There is one stroke every 10 minutes in Canada[3]
7 minutes	There is one heart attack every 7 minutes in Canada[3]

"Canadians are more confident about physically surviving a critical illness than financially surviving it."

- The **5-year survival rate** for all cancers is 62%[1]
- The **survival rates** for heart disease and stroke both went up 33%[4]
- The **#1 concern** for those affected by cancer is getting government benefits to compensate for treatment costs and lost wages[2]
- The average cost of a **single course of treatment** with newer cancer drugs is $65,000[5]

"Being able to put aside financial concerns is reason enough to get a critical illness plan."

Overcome government limitations. The strained public health care system has limited funding, resulting in soaring drug costs and waiting lists for treatment

Supplement employer health plans. Many employer health plans are leaner than ever before, leaving the policyholder with more out-of-pocket responsibility

Overcome loss of income. The critically ill usually have to take time off work for treatment and recovery. Their spouse may have to do the same to care for them

Cover unanticipated costs. Co-pays, deductibles, prescriptions, medical supplies, childcare, housecleaning, transportation, meals and other costs add up

[1] Canadian Cancer Statistics, 2012.
[2] Weighing Quality of Life in Cancer, Colorectal Cancer Association of Canada, March/April 2011.
[3] Heart & Stroke Foundation Statistics.
[4] Statistics Canada, Leading Causes of Death, 2009. Released July 2012.
[5] Canadian Cancer Society, Majority of Canadians Worried about Cost of Cancer Drugs, September 2010.

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Thoughts on Design

. . . and moving the economy forward

M.G.(Ron) Britton, P.Eng

Almost every business magazine stresses the need for innovation and creativity to stimulate our economy. Government press releases and 'stimulation' programs echo this need. In most popular press articles, and in many government programs, research and science are seen as the keys to a better world. Meanwhile, back in numerous design offices, engineers keep looking for solutions that will produce the results others speak of.

Maybe we need to take a look at these popular 'catch phrases' so we can determine where our profession, and the design work we do, fit into the picture. My dictionary notes that 'innovate' is a verb that means "*introduce new methods, ideas, or products*". 'Creativity' is defined as an adjective "*involving the use of the imagination or original ideas in order to create something*".

Still in the dictionary we are reminded that design can be a noun; "*a plan or drawing produced to show the look and function or workings of something before it is built or made*" or a verb; "*conceive and produce a design for*" or "*plan or intend for a purpose*". So according to the linguists among us, design can be either an 'action' or a 'thing.' And if we engineers do, in fact, spend our time looking for 'solutions' to problems, it is interesting to note that one dictionary definition notes that the noun 'solution' is "*the correct answer to a puzzle*".

> "We must be creative and innovative if our economy is going to prosper. "

I admit I have taken this definition slightly out of context, but it is a bit of an ego booster.

If one is looking for inspiration, the definitions of 'innovate' and 'creativity' speak to new possibilities. 'Design', on the other hand, sounds rather routine. Routine, in most cases, is safe and unspectacular. On the other hand, new and exciting can be, and usually is, risky. So, when we venture into the world of creative design, the results can be spectacular, and the complications unpredictable.

If you want a modern illustration, consider Boeing's new Dreamliner 787. Design associated with this plane started sometime in the 1990s. It involved all sorts of innovation, including, but not limited to, the use of composite materials, a unique manufacturing process, a physical configuration that should result in significant fuel savings, and development of new energy efficient engines. At each stage of design, old limits were pushed and new ideas were tested. Delays were endlessly frustrating as theory ('innovation' and 'creativity') met reality. Tests were conducted and modifications happened. However, in late 2009 the maiden flight of the 787 occurred. Innovative/creative design had produced an innovative product. During the period when more than 1000 test flights were being conducted, and further modifications were being introduced, sales began to occur. The aircraft was certified in mid 2011. Some of the innovation that resulted in the creation of this new aircraft and some of the frustrations that delayed its delivery occurred right here in Winnipeg. But the plane flew; until the lithium-ion batteries started over heating.

I have every confidence that the 787 problems will be resolved. I expect that the anticipated 20% fuel savings will at least come close to being realized. I also expect there will be one or two more 'hiccups' before the 787 becomes part of the scenery in the aviation industry.

This is not a story of mistakes being corrected, but of technologies being pushed to their limits and often discovering what those limits are. This is the reality of creative/innovative design in action. It is the new application of old systems that are integrated with unproven new systems. It is the process of testing to see if the anticipated limits are, in fact, the limits that occur. It is a modern example of an age-old engineering process. We can learn from observation, as well as research.

Yes, both the business magazines and government programs are correct. We must be creative and innovative if our economy is going to prosper. But most of that technical creativity and innovation will happen within engineering design offices. Assuming that the process is allowed to progress without too much uninformed interference, new products and systems will emerge. And while that is happening, routine design will keep the existing system functioning until the new innovations hit the market.

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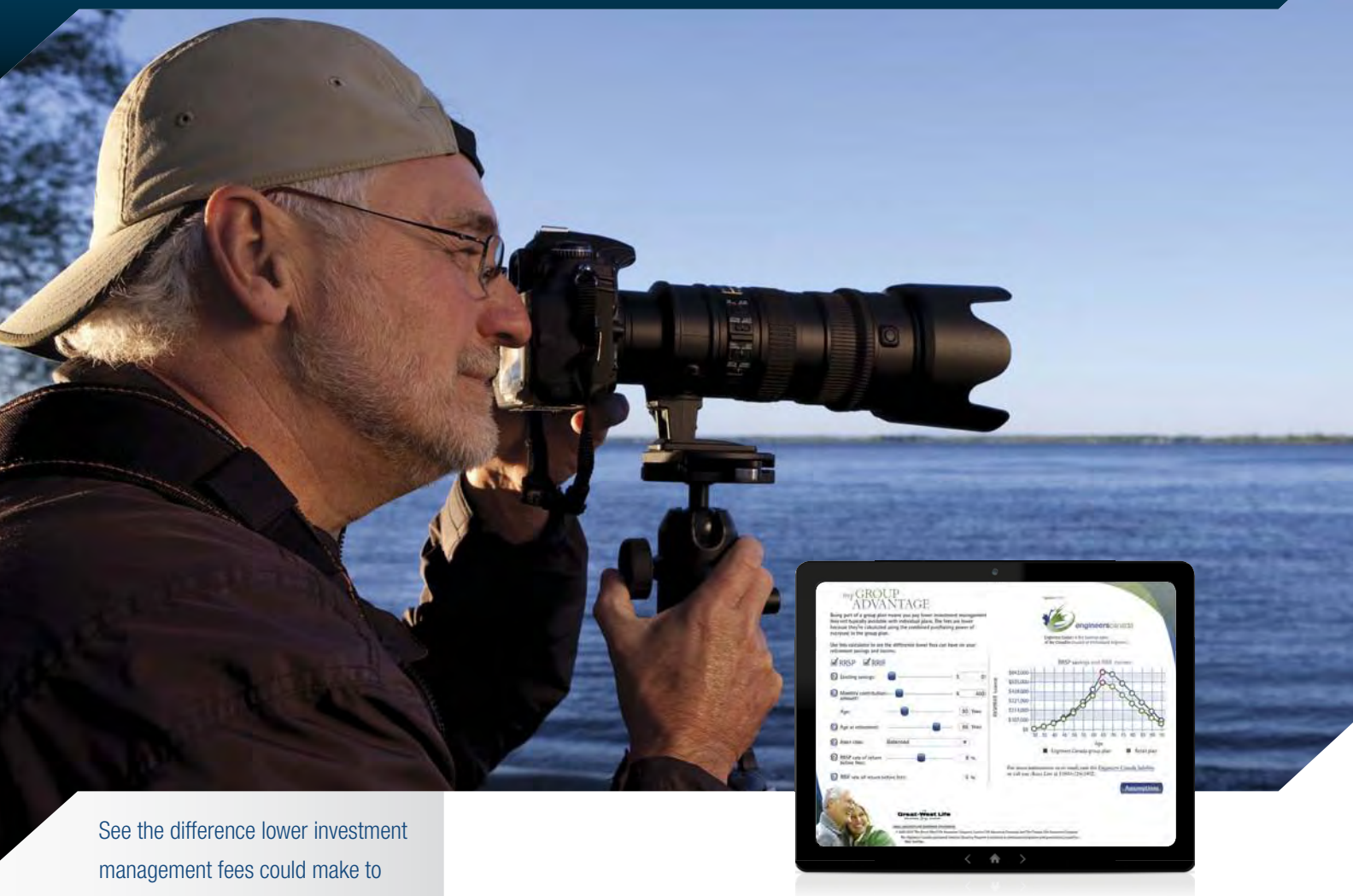

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Access to **Markets**

This content was taken from the 'EWBibliotheque' section of the my.ewb.ca *website.*

Engineers Without Borders is working in Zambia and Malawi to foster stronger market linkages between small-scale farmers and private sector enterprises.

Fragmented Market Opportunity

Honey farming in Zambia is widespread, yet farmers in the town of Mwinilunga were struggling to earn an income. In 1997, Daniel Ball saw a unique opportunity to change this. He started Forest Fruits, a honey aggregation and processing company that now works with almost 6,000 small-scale farmers in Mwinilunga. Forest Fruits offered honey farmers a market opportunity to sell their crops, and access a lasting source of income. Today, Forest Fruits has become a $1 million international business by unleashing the power of honey farmers in the region. Business – not handouts – has transformed the lives and secured the futures of these farmers.

However, unlike Mwinilunga, millions of small-scale farmers across Southern Africa still do not have access to formal markets in which to sell their crops. As a result, many hardworking farmers with high quality products struggle to find buyers for their crops so that they can earn an income.

These challenges stem from the limited private sector that exists in both Zambia and Malawi. Here, enterprises are either unwilling or unable to integrate rural farmers in formal markets. Working with small-scale farmers is perceived as high risk, and private enterprises often do not have the ability to reach more remote locations. For farmers, the transformative power of business is often lost.

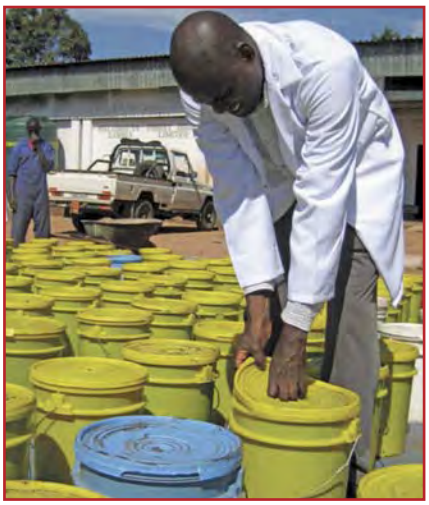
Even when present, the linkages between private enterprises and farmers are weak. Farmers do not have the business skills necessary to negotiate beneficial relationships, and enterprises are often only focused on immediate returns. Impactful business relationships depend on building mutual trust, which is often difficult. For many farmers, Daniel Ball's story is only one of hope.

Building the Skills of Market Facilitators

Engineers Without Borders is facilitating stronger linkages between the private sector and rural farmers in Southern Africa. To do so, our volunteers are working to improve the ability of development organizations to broker more beneficial commercial relationships.

In this role, development organizations are recognizably neutral players, well-placed to act as market facilitators. International Development Enterprises is an example of one such organization – they are brokering relationships between farmers and private enterprises to increase access to suppliers, microcredit, and market opportunity.

However, many development organizations often lack the field knowledge and internal processes necessary to foster strong commercial relationships between private enterprises and small-scale farmers. It is by nurturing their capacity that EWB is creating lasting change for farmers in Zambia and Malawi.



Forest Fruits honey is collected from rural Zambian beekeepers and delivered to markets nationwide. Photo: Mark Hemsworth

Effective Relationships

EWB volunteers are working with our development partners to build the market facilitation skills of field staff. Here, field staff have the most frequent and meaningful contact with farmers – it is critical to ensure they are able to understand farmers and private enterprises to create strong market linkages.

Brokering mutually beneficial commercial relationships is complex, as each market intervention changes depending on the interests of the farmer and company. EWB's presence is critical, as we have the experience to understand both the business objectives and the realities of a small-scale farmer.

Market facilitators must be responsive, innovative, and business savvy. EWB has developed a tool that translates these facilitation goals into tangible roles for field staff. This ensures that our development partners can better assess staff strengths, develop tailored training plans, and provide ongoing training once on-the-job. Our targeted approach is improving the ability of field staff to foster impactful linkages between private enterprise and farmers. With increased market access, rural farmers now have the opportunity to thrive.

Private sector-farmer relationships are always evolving. It is therefore important that development organizations can understand, interpret, and adjust their approach to market facilitation. EWB staff work with our partners to create relevant monitoring systems to reflect less tangible organizational learning. This work ensures that our partners can learn from their mistakes, and facilitate more valuable market linkages going forward.

The Way Forward

At EWB, we have long recognized that business and market opportunity can change the lives of rural farmers. As a result, we are improving the ability of partner development organizations to broker strong relationships between enterprises and small-scale farmers. In a few short years we have worked with 15 development partners, helped to create 1,700 jobs and ultimately, impacted the lives of 15,000 farmers. For us, this is just the beginning.

Over the next five years, EWB aims to broaden our impact by expanding the market opportunities of Southern Africa's small scale farmers. We will generate ideas and pilot innovative ways to improve market facilitation in Southern Africa. EWB will continue scaling up approaches that work, such as our staff training tools. We aspire to invest in the next generation of agribusiness leaders – like Daniel Ball – to harness the power of small-scale farmers through inclusive business models. We have great ambitions in Southern Africa. As an innovative organization, EWB is filing a niche role to build the capacity of market facilitators and expand market opportunities for small scale farmers in Southern Africa.

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Permanent Residency for **Foreign Engineers**

By R. Reis Pagtakhan

Government labour market forecasts indicate that Canada will face a shortage of professionals in the coming years. One solution to this problem is to recruit foreign engineers and geoscientists to work in Canada to complement an employer's Canadian work force.

Permanent resident or temporary work permits; What is the smartest way to recruit from overseas?

Permanent residency is an immigration status that allows a foreign national to live and work in Canada on a permanent basis. Unfortunately, the process of achieving permanent residency can take months and even years to complete. As a result, it is usually better at the outset to bring a foreign engineer or geoscientist to Canada as a temporary foreign worker. The foreign professional is then given a permit to work in Canada, which normally restricts them to work for a specific employer and at a specific location for a finite amount of time. Once in Canada, the foreign professional can apply for Canadian permanent residency.

When recruiting from overseas, Manitoba employers should first look at candidates from countries with which Canada has signed free trade agreements. Foreign professionals who are hired to work in Canada pursuant to these free trade agreements are given expedited processing to work here.

What are the advantages of permanent residency?

The biggest advantage of permanent residency is that foreign professionals will have virtually the same workplace mobility as Canadian citizens. In other words, while work permits usually restrict a foreign professional to work in a specific location and for a specific employer, a foreign professional who becomes a Canadian permanent resident will likely be able to work for any employer at any location. For firms and companies who may be looking to promote or relocate a foreign professional, permanent residency is beneficial.

What are the disadvantages of permanent residency?

The big disadvantage employers face with permanent residency is that the foreign professional is no longer restricted to working for a specific employer. Foreign professionals who are working in Canada on work permits typically have to go through a process to change employers. For foreign professionals who are working here pursuant to free trade agreements, the process can be completed in days or weeks. Foreign professionals from other countries may face longer waits.

Permanent residency – Which immigration option should be chosen?

At the present time, the two most applicable programs for immigration to Manitoba are the Canadian Experience Class and the Manitoba Provincial Nominee Program.

While these programs are identical in the end result – both lead foreign nationals to permanent residency – the criteria are somewhat different. The challenge is choosing the correct option.

At present, the best option for foreign professionals and their Canadian employers is the Canadian Experience Class. The main reason for this is that Canadian Experience Class allows most Manitoba employers to recruit foreign professionals without having to register under provincial immigration legislation known as the Worker Recruitment and Protection Act.

While registration under this Act is not onerous, it does require employers to take certain steps and keep certain records, and opens up the potential of Employment Standards investigations. By recruiting foreign professionals to whom this Act does not apply, employers can avoid the costs associated with compliance.

Another reason why the Canadian Experience Class should be chosen is that applicants under Manitoba's nominee program must show that they intend to live and work in Manitoba not only at the time an application is filed but up to and including the date that they complete the permanent residency process. As a result, if a foreign professional is already working in Canada and their employer wishes to relocate him or her to work in another Canadian province or territory, a Manitoba Provincial Nominee Program application is not advisable.

This Article is prepared for general information purposes only and should not be viewed as legal advice or opinion. Reis is a partner with Aikins Law and practices in the areas of immigration law. If you have any questions on this article please contact Reis at (204) 957-4640 or rrp@aikins.com.

WISE Kid-Netic Energy

An Overview of Manitoba's Unique Program

By N. Masood, EIT

Did you know that APEGM has been sponsoring WISE Kid-Netic Energy at the University of Manitoba since 2008? Do you know what WISE Kid-Netic Energy does? Here is your chance to find out more about this unique Manitoba program.

The WISE (Women in Science and Engineering) Kid-Netic Energy program was established in 1990 at the University of Manitoba. We are the largest non-profit science and engineering outreach program in the province and one of the largest in the country. Last year alone we interacted with over 30,000 students from grades Kindergarten through grade 12 in Northern Manitoba communities like Thompson and Churchill, in First Nations communities like Brochet and Garden Hill, in farming communities like Killarney and Morden, and in Winnipeg as well. We have employed over 80 young women pursuing degrees in science and engineering as our instructors. They are our champions and they demonstrate year after year to their audiences that science and engineering are meaningful career options for women. Our group is involved with APEGM's Committee for Increasing the Participation of Women in Engineering (CIPWIE) and is also a proud member of Actua. Actua is a network of 33 members at universities and colleges across Canada that annually delivers hands-on STEM (Science Technology Engineering Math) programming. We receive baseline funding from the University of Manitoba, Faculty of Science and Faculty of Engineering, the total of which constitutes about 25% of our overall budget. We are

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We have interacted with most youth across Manitoba through our hands-on Manitoba science curriculum-based workshops that are presented in kindergarten to grade 12.

responsible for fundraising the rest. We have received support from Engineers Canada, APEGM, and NSERC.

Since 2009, we have proudly run science and engineering girls clubs. Participants in grades 3-7 meet for 18 three-hour sessions during the school year. These sessions provide great environments for girls to further develop their love of learning through many field trips and mentorship opportunities. The girls have participated and placed well in the APEGM Spaghetti Bridge Competition. In fall 2012, we started a second girls club in the inner-city with the Boys and Girls Club of Winnipeg at their Freight House location. The girls at that location prepare and enjoy a meal together and then participate in experiential science and engineering activities. Many thanks to Kathryn Atamanchuk, Eleanor McEwan, Ruth Horne, Aimee Leigh Betker, Courtney Skene-Hamilton, Alyssa Robinson, Kee Koxu, and Jessica McCombe for graciously volunteering their time.

We have interacted with most youth across Manitoba through our hands-on Manitoba science curriculum-based workshops that are presented in kindergarten to grade 12. Teachers invite us into their classrooms to tackle concepts like simple machines, flight, structures, and electricity. Our instructors enthusiastically ignite student curiosity in English and French. This 2012/2013 school year we started the Adopt-A-Class program. The University of Manitoba Engineering Access Program (ENGAP) and the Boys and Girls Club of Winnipeg nominated schools that could benefit from our workshops for free. The schools they chose were Children of the Earth, Elmwood High School, Gordon Bell High School, St. John's High School, Niji Mahkwa, David Livingstone, Dufferin, Norquay and William Whyte. Many individuals have donated $50 to this program and received charitable tax receipts. This opportunity was used by Jonathan Beddoes, Dean of the Faculty of Engineering for Christmas gifts to his friends and family last year. Significant support was given by Actua and Dr. Annemieke Farenhorst's NSERC Chair for Women in Science and Engineering Prairie Program fund. Starting in the 2013/2014 school year, Mr. Robert Alan Kennedy (University of Manitoba Electrical Engineering class of 1962) will be making considerable personal donations for the next four years. Through the Adopt-A-Class program, WISE Kid-Netic Energy strives to connect with children looking forward to a vibrant, diverse science and engineering work force inclusive of women, Indigenous peoples, and those socio-economically underrepresented.

Our most exciting summer programs are our week-long summer camps. We travel extensively to provide five solid days of science and engineering activities for students in grades 4, 5, and 6. Summer 2013 theme days include Aerospace, Computer Science, Genetics, Medical Science, Mining, and Sustainability. We will also hold Manitoba Aerospace Space Camp with Dr. Witold Kinsner (Associate Head of Electrical and Computer Engineering) and University of Manitoba Space Applications and Technology Society (UMSATS) for high school students.

WISE Kid-Netic Energy's outreach efforts are effective. Our girls clubs are thriving and growing with regular attendance. We are struggling to meet the demand for our workshops. Teachers enthusiastically take advantage of our services. Summer campers that we have surveyed have responded that over 80% are more interested in science and engineering, over 70% are motivated to study science and engineering and over 70% are considering careers in science and engineering. If you would like to learn more about our thoughtful corporate sponsors, see our interactive outreach map, learn more about our girls clubs, workshops or camps, please visit our website: *www.wisekidneticenergy.ca.*

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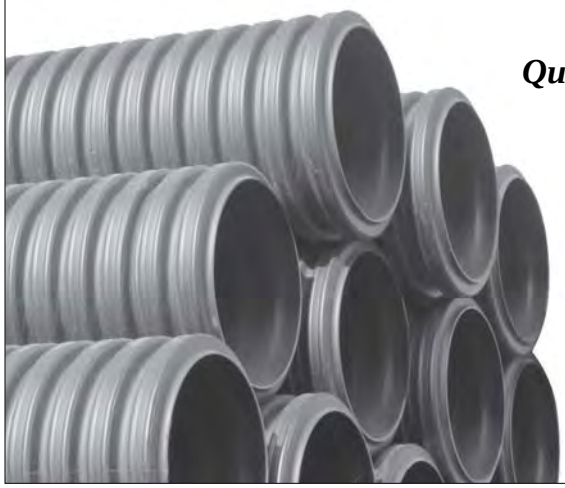

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Upcoming Course Schedule	PDHs *	Locations	2013			
Civil			**Apr**	**May**	**Jun**	**Aug**
Building Condition Assessment	24	Winnipeg	22-25			
Structural Engineering for Non-Structural Engineers	24	Winnipeg	22-25			
Foundation Design	18	Regina	24-26			
Structural Design for Lateral Loads and Stability	18	Regina				20-22
Construction			**Apr**	**May**	**Jun**	**Aug**
Bidding, Evaluation, Negotiation and Contract Award - For Construction Projects	12	Regina			6-7	
Electrical			**Apr**	**May**	**Jun**	**Aug**
Modern Power System Protective Relaying	18	Winnipeg			3-5	
Environmental			**Apr**	**May**	**Jun**	**Aug**
Small Communal Wastewater Treatment Systems	12	Regina			20-21	
Mechanical			**Apr**	**May**	**Jun**	**Aug**
Understanding Industrial Codes, PART 1 - ASME Section 8 (Pressure Vessels) and Section 5 (Non-Destructive Examination)	12	Saskatoon		23-24		
Boilers, Boiler Controls, Combustion and Steam System Efficiency	24	Winnipeg		28-31		
Pumps and Compressors: Selection, Operation and Maintenance	18	Winnipeg		29-31		

PDHs*: **Continuing professional education for licensed engineers is measured in Professional Development Hours (PDHs). A PDH is one contact hour of instruction or presentation.**

Road Trip

By Glen Cook, P.Eng.

What do you think of when someone suggests a road trip? Does the term conjure up nightmares of long family car trips across country and all you could think of was being somewhere else or "are we there yet?" Or was it something more enjoyable like a trip to visit exotic places, like Churchill or Transcona? Most engineers and geoscientists have been on site inspections or field visits of one kind or another but that is work and part of our jobs. What happens when you combine the two – a special interest related to your work!

The Heritage Committee took its first road trip this fall and it was a wonderful success. On a beautiful fall day in October, six members of the committee traveled to the site of the very first hydroelectric project in Manitoba. Many people have visited the site you say; so no big deal! It must be at the site of the old Pinawa Dam, which is now a Provincial Park with many visitors annually. No – that is not the site. The site goes by several names depending on where you get your information: Brandon Dam, Minnedosa River Power Site or 10 Mile Dam.

Now where is the site you ask? The site is in southern Manitoba in the Brandon area. The site is not well known and is not easily accessible by land. So some good investigative engineering was required to determine where the site is located and who could help. The committee enlisted the assistance of colleagues from Brandon who have real estate contacts in the area. The investigation started with the basics: Township, Range, and Section. That led to information about the current land owners, which led to a 'cold call' to the land owner in late August. That call was not answered right away because land owners in late summer in southern Manitoba are busy doing what? Harvesting the crops. So after a week the land owner returned the call and responded with "We do not know much about the site but the guy we bought the land from will know more. However do not call him right away as he will be busy driving our combine for a couple more weeks." So after a couple of weeks, contact was made with Mr. Don MacPherson from Brandon and plans were set in motion for a 'road trip.'

On Friday October 12, 2012, arrangements were made to meet Mr. Don MacPherson near the site. The committee ventured to what is called the Grand Valley area (just west of Brandon where the Little Saskatchewan River empties into the Assiniboine River) to visit the remains of the site. The timing of the trip was perfect as it coincided with the completion of the fall harvest which permitted travel across the dry wheat field to within metres of the west abutment of the site about one mile upstream on the Little Saskatchewan River. The river's name was originally the Minnedosa River but was changed in the early 1900s. The flow in the river was seasonably low and permitted full inspection of the site. The committee spent a couple of hours poking around trying to figure out how it worked and what happened to the project. It is a very interesting project and a short history is being prepared to be published on the Heritage committee wiki site in the coming weeks.

To celebrate the occasion, the committee acknowledged the event with the time-honoured tradition of a toast during lunch, no champagne, but something more appropriate from the prairies; good old beer.

The visit ended in the early afternoon and left time for two shorter visits on the return trip, the Commonwealth Air Training Plan Museum at the Brandon Airport and the Assiniboine River Diversion at Portage La Prairie. More information on both projects will be added to the Heritage committee wiki site in the future.

Road Trip members: Doug Chapman, Wally Pyl, Sam Kovnats, James Bamburak, Al Myska and Glen Cook.

Reprinted from the
NATIONAL POST

Second World War Survivor Amazed to See Her Picture on Canada Post Stamp Honouring Swedish Diplomat Who Saved Her Life

Joe O'Connor | Jan 25, 2013 9:18 PM ET

Handout Copy of original schutz-pass belonging to Judith Weiszmann (nee Judith Kopstein).

Ann Weiszmann has a fascination for Raoul Wallenberg, the Swedish diplomat credited with saving tens of thousands of Jewish lives in Nazi-occupied Hungary by issuing them bogus Swedish identity papers, or 'shutz-passes.'

Ms. Weiszmann's interest in the man is understandable: Without Mr. Wallenberg there would be no Ann Weiszmann. She is the daughter of Wallenberg Jews and a consumer of all things — academic talks, articles, books and movies — related to the Holocaust hero.

And so it was on a recent evening in Toronto that she attended the screening of a film dedicated to the great man, at the conclusion of which event organizers informed the audience that Canada Post had issued a Raoul Wallenberg commemorative stamp on January 17.

Ms. Weiszmann rushed out to buy a couple booklets, tossed them in her purse, pulled them out later to take a closer look and practically fainted. The stamp features Mr. Wallenberg and a shutz pass, and not just any shutz pass, but one belonging to Judith Kopstein — age 14 in 1944 and age 83 now — and, more importantly, Ann Weiszmann's mother.

"I couldn't believe it," she says.

Neither could her mother, Judith, a retired structural engineer, Winnipeg resident and transplanted Hungarian Jew whose shutz pass — with picture included — is now immortalized on a stamp honouring a man she regards as the 'greatest man' of the 20th century.

"It is just incredible that something like this would happen," Judith Weiszmann says. "Wallenberg was fearless. He saved people's lives by risking his own and having a stamp of him — that is very natural — but having my picture on it, that is something completely unexpected."

It is also something of a mystery.

Canada Post bought the rights to the image from an image bank. How Ms. Weiszmann's shutz pass came to be in that bank, however, is a happy subject of speculation among her family members that has produced a second startling philatelic revelation.

Sweden issued a commemorative stamp honouring Mr. Wallenberg in May 2012 featuring an image of the hero and a copy of you-know-who's shutz pass.

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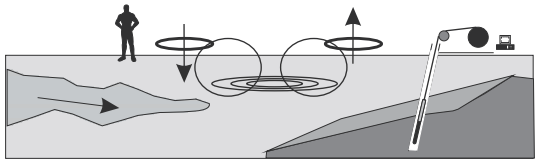

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"My son, Paul, found the Swedish stamp on the Internet," Ms. Weiszmann says.

Behind both stamps is the story of a teenaged girl living in Nazi Occupied Budapest, the final redoubt of the Hungarian Jews in 1944 — the majority of whom had already been deported and murdered in places like Auschwitz.

Judith Weiszmann on Friday.

Ms. Weiszmann's father, a lumberman, had business ties in Sweden predating the war and when Mr. Wallenberg came to town and began issuing his life-saving documents the Weiszmanns' rushed to the consulate door.

"I remember the lineup outside," Ms. Weiszmann says. "I remember everything about those days as though it were yesterday."

She remembers getting her picture taken, the picture that has come back to her after all these years — the original of which is locked in a bank vault in Winnipeg — and leaving the consulate with a phoney document and taking up residence in one of the scores of properties Mr. Wallenberg rented to house the phoney Swedes.

"He arranged dozens of these houses," Ms. Weiszmann says.

He operated soup kitchens, ran a hospital and intervened when the Hungarian Gestapo seized Ms. Weiszmann and her mother.

"Those papers saved our lives," she says.

She met Mr. Wallenberg once.

"He shook hands with me. I was only 14, and I was so very honoured because we all knew that what he was doing was something remarkable. He would go and talk to the German officers without fear, even though they attempted to assassinate him numerous times."

Judith Kopstein met her husband, Erwin, another Wallenberg Jew, after the war. They became engineers, married and fled to Canada in 1956 after the Russians crushed the Hungarian Revolution. (The Russians seized Mr. Wallenberg in 1945. He is presumed to have been killed in a Soviet prison in 1947).

"Our second miracle was coming to Canada as refugees after the Hungarian Revolution," Ms. Weiszmann says. "We were able to make a good life here. I cherish being Canadian."

The couple had a son and a daughter, and now, grandchildren. Erwin passed away 16 months ago. He was 88. His widow remains in good health. Judith Weiszmann (nee Kopstein) is a 'voracious emailer' with friends all over the world, she says, but she also enjoys posting letters the old-fashioned way and plans on mailing a handful of dispatches — with a Canadian-Wallenberg stamp attached.

"Some of my friends would be interested," she says. "It is incredible, something like this happening." NP

The Canadian Press - Judith Kopstein's picture is on the top left of Canada Post's Raoul Wallenberg stamp.

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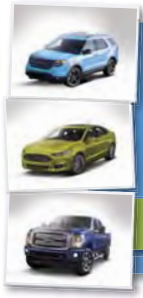

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SOFTWARE ENGINEERING, NOT COMPUTER SCIENCE

Steve McConnell, CEO, Construx Software

"A SCIENTIST BUILDS IN ORDER TO LEARN; AN ENGINEER LEARNS IN ORDER TO BUILD."
— Fred Brooks

When interviewing candidates for programming jobs, one of my favorite interview questions is, "How would you describe your approach to software development?" I give them examples such as carpenter, fire fighter, architect, artist, author, explorer, scientist, and archeologist, and I invite them to come up with their own answers. Some candidates try to second-guess what I want to hear; they usually tell me they see themselves as 'scientists.' Hot-shot coders tell me they see themselves as commandos or swat-team members. My favorite answer came from a candidate who said, "During software design, I am an architect. When I am designing the user interface, I am an artist. During construction, I am a craftsman. And during unit testing, I am one mean son of a bitch!"

I like to pose this question because it gets at a fundamental issue in our field: What is the best way to think of software development? Is it science? Is it art? Is it craft? Is it something else entirely?

'Is' vs. 'Should'

We have a long tradition in the software field of debating whether software development is art or science. Thirty years ago, Donald Knuth began writing a seven-volume series, *The Art of Computer Programming*. The first three volumes stand at 2,200 pages, suggesting the full seven might amount to more than 5,000 pages. If that is what the art of computer programming looks like, I am not sure I ever want to see the *science*!

People who advocate programming as art point to the aesthetic aspects of software development and argue that science does not allow for such inspiration and creative freedom. People who advocate programming as science point to many programs' high error rates and argue that such low reliability is intolerable—creative freedom be damned. Both these views are incomplete and both ask the wrong question. Software development is art. It is science. It is craft, archeology, fire fighting, sociology, and a host of other activities. It is amateurish in some quarters, professional in others. It is as many different things as there are different people programming. But the proper question is not "What *is* software development currently?" but rather "What *should* professional software development be?" In my opinion, the answer to that question is clear: Professional software development should be engineering. Is it? No. But should it be? Unquestionably, yes.

SOFTWARE ENGINEERING, NOT COMPUTER SCIENCE

Engineering vs. Science

With only about 40 percent of software developers holding computer science degrees and practically none holding degrees in software engineering, we should not be surprised to find people confused about the difference between software engineering and computer science. The distinction between science and engineering in software is the same as the distinction in other fields.[1] Scientists learn what is true, how to test hypotheses, and how to extend knowledge in their field. Engineers learn what is true, what is useful, and how to apply well-understood knowledge to solve practical problems. Scientists must keep up to date with the latest research. Engineers must be familiar with knowledge that has already proven to be reliable and effective. If you are doing science, you can afford to be narrow and specialized. If you are doing engineering, you need a broad understanding of all the factors that affect the product you are designing. Scientists do not have to be regulated because they are chiefly accountable to other scientists. Engineers do have to be regulated because they are chiefly accountable to the public. An undergraduate science education prepares students to continue their studies. An undergraduate engineering education prepares students to enter the workforce immediately after completing their studies.

Universities award computer science degrees, and they normally expect their computer science students to obtain software development jobs in which they will immediately begin solving real-world problems. Only a small fraction of computer science undergraduates go on to graduate school or research environments in which they are advancing the state of knowledge about software or computers.

This puts computer science students into a technological no-man's land. They are called scientists, but they are performing job functions that are traditionally performed by engineers, without the benefit of engineering training. The effect is roughly the same as it would be if you assigned a physics Ph.D. to design electrical equipment for commercial sale. The physicist might understand the electrical principles better than the engineers he is working with. But his experience in building equipment is in creating prototypes that are used to advance the state of knowledge in a laboratory. He does not have experience or training in designing rugged, economical equipment that provides practical solutions in real-world settings. We would expect the equipment designed by the physics Ph.D. to work, but perhaps to lack some of the robustness that would make it usable or safe outside a laboratory. Or the equipment might use materials in a way that is acceptable for a single prototype but extravagantly wasteful when units are manufactured by the thousands.

Situations resembling this simple physics example occur literally thousands of times each year in software. When workers educated as computer scientists begin working on production systems, they often design and build software that is too frail for production use, or that is unsafe. They focus narrowly and deeply on minor considerations to the exclusion of other factors that are more important. They might spend two days hand-tuning a sorting algorithm instead of two hours using a code library or copying a suitable algorithm from a book. The typical computer science graduate typically needs several years of on-the-job training to accumulate enough practical knowledge to build minimally satisfactory production software without supervision. Without appropriate formal education, some software developers work their entire careers without acquiring this knowledge.

The lack of professional development is not solely the software developer's failure. The software world has become a victim of its own success. The software job market has been growing faster than the educational infrastructure needed to support it, and so more than half the people holding software development jobs have been educated in subjects other than software. Employers cannot require these software retreads to obtain the equivalent of an undergraduate engineering degree in their off hours. Even if they could, most of the courses available are in computer science, not software engineering. The educational infrastructure has fallen behind industry's needs.

"THE SOFTWARE JOB MARKET HAS BEEN GROWING FASTER THAN THE EDUCATIONAL INFRASTRUCTURE NEEDED TO SUPPORT IT."

Beyond the Buzzword

Some people think that 'software engineering' is just a buzzword that means the same thing as 'computer programming.' Admittedly, 'software engineering' has been misused. But a term can be abused and still have a legitimate meaning.

The dictionary definition of 'engineering' is the application of scientific and mathematical principles toward practical ends. That is what most programmers try to do. We apply scientifically developed and mathematically defined algorithms, functional design methods, quality-assurance methods, and other practices to develop software products and services. As David Parnas points out, in other technical fields the engineering professions were invented and given legal standing so that customers could know who was qualified to build technical products.[2] Software customers deserve no less.

Some people think that treating software development as engineering means we will all have to use formal methods—writing programs as mathematical proofs. Common sense and experience tell us that that is overkill for many projects. Others object that commercial software is too dependent on changing market conditions to permit careful, time-consuming engineering.

These objections are based upon a narrow and mistaken idea of engineering. Engineering is the application of scientific principles toward *practical* ends. If the engineering is not practical, it is bad engineering. Trying to apply formal methods to all software projects is as bad an idea as trying to apply code-and-fix development to all projects.

Treating software as engineering makes clearer the idea that different development goals are appropriate for different projects. When a building is designed, the construction materials must suit the building's purpose. I can build a large equipment shed to store farming vehicles from thin, uninsulated sheet metal. I would not build a house the same way. But even though the house is sturdier and warmer, we wouldn't refer to the shed as being inferior to the house in any way. The shed has been designed appropriately for its intended purpose. If it had been built the same way as a house, we might even criticize it for being 'over-engineered'—a judgment that the designers wasted resources in building it and that it actually is not well engineered.

"SOFTWARE PROJECTS NEED TO FOCUS MORE ON OPTIMIZING PROJECT GOALS THAN OTHER KINDS OF ENGINEERING DO."

In software, a well-run project can be managed to meet any of the following product objectives:

- Minimal defects
- Maximum user satisfaction
- Minimal response time
- Good maintainability
- Good extendibility
- High robustness
- High correctness

Each software project team should define the relative importance of each characteristic explicitly, and then the project team should conduct the project in a way that achieves its objectives.

Software projects are different from engineering projects that use physical materials. In other kinds of engineering, the cost of materials can contribute 50 percent or more of the total project cost. Some engineering companies report that they automatically regard projects with labor constituting more than 50 percent of project cost as high risk.[3] On a typical software project, labor costs can contribute almost 100 percent of the total project cost. Most engineering projects focus on optimizing *product* goals; design costs are relatively insignificant. Because labor cost makes up such a large part of total lifetime software costs, software projects need to focus more on optimizing *project* goals than other kinds of engineering do. So, in addition to working toward product objectives, a software team might also work to achieve any of the following project objectives:

- Short schedule
- Predictable delivery date
- Low cost
- Small team size
- Flexibility to make mid-project feature-set changes

Each software project must strike a balance among various project and product goals. We do not want to pay $5,000 for a word processor, nor do we want one that crashes every 15 minutes.

Which of these specific product and project characteristics a project team emphasizes does not determine whether a project is a true 'software engineering' project. Some projects need to produce software with minimal defects and near-perfect correctness—software for medical equipment, avionics, anti-lock brakes, and so on. Most people would agree that these projects are an appropriate domain for full-blown software engineering. Other projects need to deliver their software with adequate reliability but with low costs and short schedules. Are these properly the domain of software engineering? One informal definition of engineering is "doing for a dime what anyone can do for a

dollar." Lots of software projects today are doing for a dollar what any good software engineer could do for a dime. Economical development is also the domain of software engineering.

Today's pervasive reliance on code-and-fix development—and the cost and schedule overruns that go with it—is not the result of a software engineering calculation, but of too little education and training in software engineering practices.

The Right Questions

Software development as it is commonly practiced today does not look much like engineering, but it could. Once we stop asking the wrong question of, "What is software development currently?" and start asking the right question of, "*Should* professional software development be engineering?" we can start answering the really interesting questions. What is software engineering's core body of knowledge? What needs to be done before professional software developers can use that knowledge? How big is the payback from practicing software development as an engineering discipline? What are appropriate standards of professional conduct for software developers? For software organizations? Should software developers be regulated? If so, to what extent? And, perhaps the most interesting question of all: What will the software industry look like after all these questions have been answered?

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[1] For much of this discussion, I am indebted to David L. Parnas, especially for his paper, "Software Engineering Programmes Are Not Computer Science Programmes," *IEEE Software*, November/December 1999.

[2] Parnas, David L., "Software Engineering: An Unconsummated Marriage," *Software Engineering Notes*, November 1997.

[3] Baines, Robin, "Across Disciplines: Risk, Design, Method, Process, and Tools," *IEEE Software*, July/August 1998, pp. 61-64.

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WISDOM FROM AN OLD *Geoscientist*

Grant Koropatnick, P.Eng., *Executive Director & Registrar*

NICHOLAS KOROPATNICK 1917-1997

My uncle Nicholas Koropatnick was a Bachelor of Geology grad from Brandon University – Class of 1940. Today he would be registered as a Professional Geoscientist. He served his whole career with INCO at Sudbury, Ontario. During World War II, he was a lieutenant in the 2nd Canadian Survey Regiment. He was, as they say: "tough as nails." He was my Dad's oldest brother.

I remember 'Uncle Nick' coming to stay at our home when I was a teenager. He still wore his military issue shirts and pants. Of course, he lost the neck-tie and opened his collar a few buttons to reveal his chest hairs. He was a 'man's man.' He cussed, told stories and started sipping Crown Royal at about ten in the morning. He liked it with a splash of water – no ice. He was an accomplished Bridge player and derided you if you could not play at his level. Loud and larger than life, he enjoyed intellectual conversation, crossword puzzles and poetry. I have one of his poetry books. If he were alive today he would be 95. I hope to meet him again one day.

In addition to his war medals and other small trinkets, one of the precious mementoes I have from my uncle is a page of wise sayings he hand-wrote to me in the mid-nineties. I call it 'Wisdom From an Old Geoscientist.' Here are a few of the gems:

- ***Frood Mine Law** – Water will not run up hill, but BS will.*
- ***Wolf's Law** – You never get a second chance to make a first impression,*
- ***Toomey's Law** – It's easy to make a decision for which you have no responsibility.*
- ***Herman's Law** – If it works right the first time, you've obviously done something wrong.*
- ***The Law of Heredity** – All undesirable traits come from the other parent.*
- ***Quigley's Law** – If you take off the right-hand glove in extremely cold weather, the key will be in your left-hand pocket.*
- ***Dupont's Law** – Never take yourself too seriously.*
- ***Short's Law** – Half of being smart is knowing what you're dumb at. (a) a little ignorance can go a long way – spread it thinly and (b) Learn to be sincere – even if you have to fake it.*
- ***Walker's Law** – Associate with well-mannered persons and your manners will improve (a) Run with decent folk and your decent instincts will be strengthened (b) Keep the company of bums and you will become a bum yourself (c) Hang around with rich people and you will end up picking up the check and dying broke.*
- ***Koropatnick's Law** – Nothing is as easy as it looks. If it looks easy, it will probably turn-out differently. If it looks difficult, it will likely be god dam near impossible! Everything takes longer than you expect.*

A Geologist is one who knows a great deal about very little and who goes along knowing more and more about less and less until he knows practically everything about nothing. An Engineer is one who knows very little about a great deal. He keeps knowing less and less about more and more until he knows practically nothing about everything. An Operator starts out knowing practically everything about everything, but ends-up knowing nothing about anything due to associating with Geologists and Engineers!

Nicholas Koropatnick 1917-1997 ✸

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The Experience Review Committee

Billy Chan, EIT

This article is the first in a series featuring every committee of APEGM and what they do for APEGM and its members.

It is arguably one of the most well-known committees in APEGM. There is nary an engineer or geoscientists who have graduated or moved to Manitoba in the past 18 years who have not come under the scrutiny of this committee. For most members, it is one of the first points of contact they have with APEGM.

The Experience Review Committee (ERC) was started in 1995 after Council decided that a program be put in place to ensure that Members-in-Training (MITs) received appropriate development before registration at the end of their work experience requirement and increased the experience requirement from two to four years. To become a registered professional engineer or geoscientist in Manitoba, an individual must be academically qualified and have at least four years of relevant practical and progressive work experience under the supervision of a professional engineer or geoscientist. The MITs must submit progress reports detailing their work experience and development in five key areas: application of theory, practical experience, engineering management, communication skills, exposure to professional and ethical responsibilities, and increasing awareness in the social implications of engineering. The ERC reviews these reports to ensure that their experience complies with the policies, procedures, and requirements established by Council.

In February, I was privileged to be a 'fly on the wall' to observe an ERC meeting take place . The 24 member ERC meets monthly (including the summer months!) to discuss policy issues and review the regular reports of 1207 MITs (as of this writing) averaging approximately 120 files reviewed per month and 50 per member. One member boasted reading 14 reports (a fairly significant stack of paper) in preparation for this meeting. All this is done by volunteers.

> **“The process of review depends on the dedication and unpaid efforts of this small committee.”**

The meeting started mundanely enough. There was a great shuffle of papers as members arrived at the McKinley A meeting room at the APEGM building, then a calling to order by the bushy committee chair, approval of the meeting agenda moved and seconded, arrival of a few late comers (the meetings are held during regular work hours), the reviewing of minutes from the previous meeting, and then diving quickly to business. What struck me was the cool, dispassionate and benefit-of-the-doubt-giving examination of each report (a process I doubt the hiring reps at companies I applied to after graduation would have afforded to me!). I also found it interesting that MIT files are matched to an ERC reviewer based on the MIT's discipline. I was impressed by how personal of a process this could potentially provide versus randomly assigning MIT progress reports to random members. It is conceivable that the same ERC member will follow the progress of an MIT through the first four years of their career with this process, analogous to an apprenticeship-type relationship. The difference is that the relationship is more removed and relies heavily on progress reports.

Having written my fair share of these progress reports, I appreciate the amount of hours that goes into writing them and what those reports represent. Having now seen how ERC members deliberate on MIT reports bring to mind scenes from legal dramas when jurors coolly discuss the fate a one person considering only the presented evidence. In many ways the concepts between the two settings are similar. The ERC has only the report of the MIT and the comments from their supervisor and/or mentor to base their decisions upon. The ERC cannot meet every member and follow them around for six months. This would be impossible for many reasons and thus much reliance is put upon the integrity of the MIT, their supervisor and/or their mentor. Occasionally though, if a report is extremely convoluted and inconsistent with the supervisor or mentor comments (as witnessed during this particular ERC meeting), then a member may follow-up with the MIT or supervisor in question, but this is more the exception than the rule.

In much the same vein as jury deliberations, the impactful consequences of the discussions that I witnessed was not lost on me (nor the ERC) as I saw the consent of new members, the approval of many member reports, the reinstatement of some members and the rejection of a few. A lot happens and a lot of people are affected by the outcome of these meetings. I shake my head as the ERC rejects a few progress reports consisting of only 1 short paragraph. Apparently this happens often.

In short, the experience review process is a well-ordered chaos. Members-in-Training develop professionally, they record their progress in detailed reports, the reports are reviewed by ERC members and the ERC approves and disapproves each report until the fulfillment of the 48 month requirement. The process of review depends on the dedication and unpaid efforts of this small committee reading what are essentially bi-annually updated resumes which can be as long as a small novel or as short as a paragraph at six or more reports per committee member per month. The ERC depends on the truthfulness of the MIT, the competency of the supervisor in managing their subordinate and/or the conscientious support of the mentor in providing the full picture of MIT's development. In the background, all of this is held together by a couple of APEGM staff members in Admissions. And yet it works. ●

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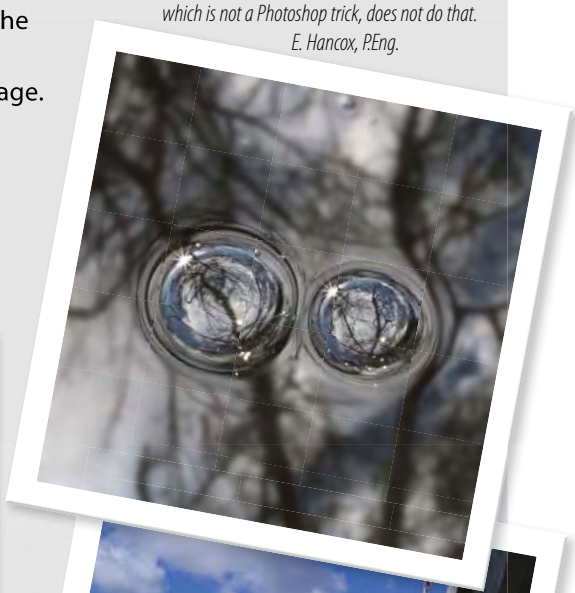
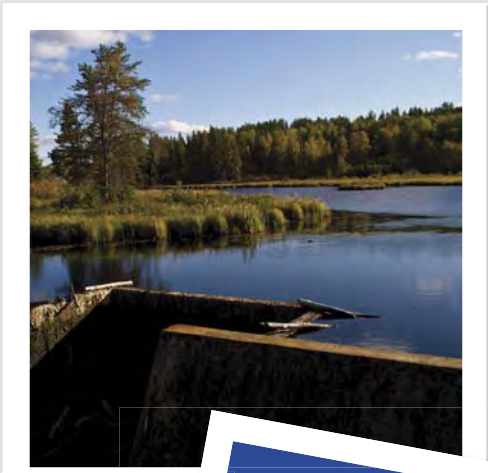
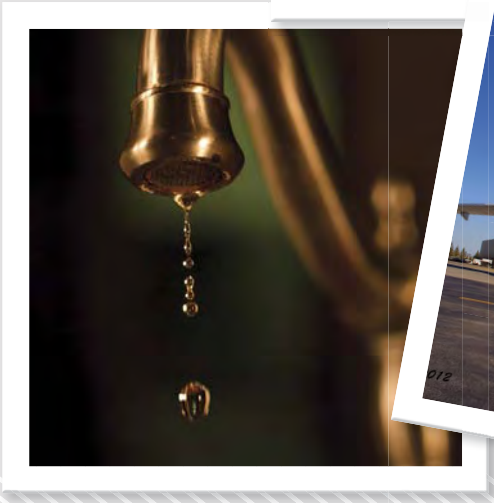
"Double Bubble" - Typically water droplets will display the inverse of an image. Note this image, which is not a Photoshop trick, does not do that. E. Hancox, P.Eng.



"Man and Nature" - Sometimes the combination can be captivating. E. Hancox, P.Eng.



"Water Droplets" - Engineering, Physics, and Beauty; our worlds life blood at your fingertips every day. E. Hancox, P.Eng.



"Down Ramp" - This structure was designed by APEGM Members, built locally, and used by the world. E. Hancox, P.Eng.

"Volga Dnepr AH-124-10" - This photo was taken in 2012 while parked at the new Winnipeg James Richardson International Airport. This heavy lift aircraft, one of the Antinov series, is a remarkable example of aerospace engineering that lands regularly in Winnipeg. E. Hancox, P.Eng.

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So enjoy this magazine...and KEEP THINKING GREEN.

By Michael Gregoire, P.Eng.

That's How We've 'Always' Done It

I am a firm believer that the only constant is change. Unfortunately, having this belief does not save me from falling into the trap of repetition. Repetition is good for business, since it is both efficient and comforting. To the professional, though, it may lead to complacency.

Here at APEGM, there have been of late, two examples of unhealthy repetition in the professional engineering realm. They both relate to a change in design standards, and how the designer in question responded to those changes.

In the first instance, many years had passed since the introduction of a new design methodology. For a long time, use of either the old design methodology or the new one was considered appropriate. Recently, though, the old design methodology was put to rest and was no longer considered appropriate.

For one of our members, this transition was troubling and appeared abrupt. Despite the fact that communications through the years indicated that the change was coming, they chose not to learn the new method. One of their justifications was, "it has worked for many years without failure".

This position is troubling for me as it goes against the training I received. As professionals, we cannot wait for a methodology to fail; we are expected to attempt to predict new failure mechanisms and plan accordingly. For the nose-to-the-grindstone engineer or geoscientist, this may simply mean keeping abreast of new methods developed by others and taking some time to learn them.

The second instance of unhealthy repetition involved the design of a structure. For several years, a member was using the same design for a building. This pattern of repetition led to a complaint being made to APEGM's Investigation Committee. Through the investigation, it was discovered that the pertinent structural code had been updated twice during the period of repeated use of the design, but that said changes were not being reflected in the drawings.

There is no doubt that this example of unhealthy repetition leading to complacency was facilitated by a less-than-ideal relationship that has formed between many of our professional members and an authority having jurisdiction. I have been involved with an industry advisory group for several years and the consistent message has been that many of APEGM's members have been submitting unsatisfactory designs. My understanding is that one of the drivers of this behaviour has been delays in the approval process by the authority having jurisdiction. However, a desire to satisfy a client's timelines does not justify the submission of incomplete documentation.

The City of Winnipeg is, once again, making efforts to improve their Plans Examination process. One stated initiative was (and still is) to eliminate incomplete submissions by professionals. As a flag for this initiative, they implemented a 'professional's certificate' highlighting the responsibilities of designers. Despite this flag, I am of the understanding that many members are still submitting unsatisfactory designs. Once again, repetitive behaviour patterns prove difficult to modify and lead to complacency.

The effort to achieve the above initiative is being sought in earnest. For example, the professional's certificate indicates that the City of Winnipeg will make a complaint to APEGM or MAA in cases where they deem it is necessary. Since May of last year, APEGM has received three such complaints. This is in stark contrast to the zero complaints made by the City in my previous four years with APEGM.

Do you have any repetitive methods in your professional life? If so, perhaps it is time to re-evaluate them, even if at a cursory level, to determine whether or not it's time to make an effort to improve that task. I do not mean to imply that all repetitive functions are unhealthy, but if we don't evaluate them on occasion, we are bound for complacency.

As always, I welcome any questions that you may have with respect to professional practice or other regulatory issues. Email me at: *mgregoire@apegm.mb.ca*

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